TEACHER RETIREMENT SYSTEM OF TEXAS MEETING
BOARD OF TRUSTEES

AGENDA

February 22, 2017 – 10:00 a.m.
February 23, 2017 – 8:30 a.m.
February 24, 2017 – 8:30 a.m.

TRS East Building, 5th Floor, Boardroom

All or part of the February 22-24, 2017, meeting of the TRS Board of Trustees may be held by telephone or video conference call as authorized under Sections 551.130 and 551.127 of the Texas Government Code. The Board intends to have a quorum and the presiding officer physically present at the following location, which will be open to the public during the open portions of the meeting: 1000 Red River, Austin, Texas 78701 in the TRS East Building, 5th Floor, Boardroom.

NOTE: The Board may take up any item posted on the agenda during its meeting on Wednesday, February 22, 2017, or during the meeting on the following days, February 23-24, 2017, beginning at the time and place specified on this agenda.

The open portions of the February 22-24, 2017, Board meeting are being broadcast over the Internet. Access to the Internet broadcast of the Board meeting is provided at www.trs.texas.gov.

1. Call roll of Board members.

2. Consider Board administrative matters, including the following– David Kelly.
   A. Consider a memorial resolution for Anita Smith Palmer.
   B. Approval of the December 1-2, 2016 proposed meeting minutes
   C. Excusing Board member absences from the December 1-2, 2016, Board meeting.
   D. Setting, rescheduling, or canceling future Board meetings.

3. Provide an opportunity for public comment – David Kelly.

4. Receive an overview of the Board meeting agenda and theme – Brian Guthrie.

5. Receive an update on the TEAM Program and schedule – Brian Guthrie and Chet Henry.
6. Review and discuss the Executive Director's report on the following matters – Brian Guthrie:
   A. Review Strategic Plan and Executive Director’s Goals.
   B. Discuss TRS history, operations, and workforce overview.
   C. Reviewing Board Governance
   D. Board operational matters, including a review of upcoming Board Elections and Board Training Calendar.
   E. Preview draft agendas for upcoming Board meetings.

7. Receive the report of the Chief Benefit Officer and consider related action, including – Barbie Pearson:
   A. Approve minutes of Medical Board meetings
   B. Approve the list of members qualified for retirement for September through November.


10. Receive a presentation on Fiduciary Duties – John H. Walsh, Eversheds Sutherland.


   **NOTE:** *The Board meeting likely will recess after the last item above and resume Thursday morning to take up items listed below.*


14. Receive the report of the Audit Committee on its February 23, 2017 meeting – Chris Moss.

15. Discuss investment matters, including the following:
B. Last Five Years / Next Five Years – Britt Harris.

C. Best Practice Review – Carolina de Onis, Sylvia Bell, and Amy Barrett.

D. Blank Canvas – Mike Pia.

E. TRS Competitive Advantages – Katy Hoffman and Mohan Balachandran.

F. Optimize TRS IMD Public Equity Portfolio – Jase Auby, Chi Chai, Dale West.

G. Top 5 Priorities for 2017 – Jerry Albright.

H. Emerging Manager Program Overview – Sylvia Bell.


17. Receive a presentation on Private Equity Fee Transparency – Amy Barrett, Eric Lang, and Neil Randall; Lorelei Graye, Leodoran Financial; Jennifer Choi, Institutional Limited Partners Association; Paul Yett, Hamilton Lane; Suresh Krishnamurthy, State Street.

18. Receive a report on ISS Proxy Service Overview – Sylvia Bell; Fassil Michael, ISS.

19. Receive an overview of the Texas budgeting process and a legislative and appropriations update – Don Green and Merita Zoga.

NOTE: The Board meeting likely will recess after the last item above and resume Friday morning to take up items listed below.

20. Provide opportunity for public comment – David Kelly.

21. Recognize the service of Melinda Nink.

22. Receive an overview of the February 24, 2017 agenda – Brian Guthrie.

23. Receive a report on health care value based purchasing – Katrina Daniel and Elizabeth Teisberg, Ph.D., Dell Medical School at University of Texas.


26. Receive a report on TRS Workforce Overview – Janet Bray

27. Receive a report on 403(b) – Rebecca Merrill; Dan Pawlisch, Aon Hewitt.

28. Consider personnel matters, including the appointment, employment, evaluation, compensation, performance, duties, discipline, or dismissal of the Executive Director, Chief Investment Officer, or Chief Audit Executive – David Kelly.

29. Consult with the Board's attorney(s) in Executive Session on any item listed above on this meeting agenda as authorized by Section 551.071 of the Texas Open Meetings Act (Chapter 551 of the Texas Government Code) – David Kelly.
TAB 2B
Minutes of the Board of Trustees

December 1-2, 2016

The Board of Trustees of the Teacher Retirement System of Texas met on December 1-2, 2016, in the boardroom located on the fifth floor of the TRS East Building offices at 1000 Red River, Austin, Texas. The following Board members were present:

David Kelly, Chair
Karen Charleston
David Corpus
John Elliott
Greg Gibson
Christopher Moss
Anita Palmer

Others present:

Brian Guthrie, TRS
Ken Welch, TRS
Don Green, TRS
Carolina de Onís, TRS
Katrina Daniel, TRS
Britt Harris, TRS
Jerry Albright, TRS
Amy Barrett, TRS
Toma Miller, TRS
Ashley Inman, TRS
Katherine Farrell, TRS
Meaghan Bludau, TRS
Heather Traeger, TRS
Steve Huff, Reinhart Boerner Van Deuren
Steve Voss, Aon Hewitt
Mike Comstock, Aon Hewitt
Dr. Keith Brown, Investment Advisor
Joe Newton, Gabriel, Roeder, Smith & Company
Danny White, Gabriel, Roeder, Smith & Company
Eric St. Pierre, Gabriel, Roeder, Smith & Company
Amy Cohen, Gabriel, Roeder, Smith & Company
Philip Mullins, TRTA
Nancy Byler, TRTA
Marcy Cann, TRTA
Patricia Macias, TRTA
Tom Rogers, TRTA, ARTA
LeRoy DeHaven, TRTA
Bill Barnes, TRTA
Andrew Clark, Speaker’s Office
Rob May, State Pension Review Board
Ann Fickel, TCTA
Joni Lozano, Caremark
Rick Edwards, Caremark
Justin Emerson, Caremark
Kenneth Herbold, PRB
Ted Melina Raab, Texas AFT
Surrenda Jones, Humana
Sabina Rahman-Garcia, Humana
John Pull, State Street
Will Goldthwait, State Street

Mr. Kelly called the meeting to order at 9:10 a.m.

1. Call roll of Board members.

Ms. Farrell called the roll. A quorum was present. Mr. Colonnetta and Ms. Ramirez were absent.
2. Consider the following administrative items – David Kelly:

A. Approval of the proposed October 27, 2016 Board meeting minutes.

On a motion by Ms. Palmer, seconded by Mr. Corpus, the Board unanimously voted to approve the proposed minutes of the October 27, 2016 Board meeting.

B. Excusing Board member absences from the October 27, 2016 Board meeting.

On a motion by Dr. Gibson, seconded by Mr. Elliott, the Board unanimously voted to excuse the absences of Mr. Colonnetta and Mr. Chris Moss from October 27, 2016 Board meeting.

C. Setting, rescheduling, or canceling future Board meetings.

No changes to the future Board meetings schedule were addressed.

3. Provide opportunity for public comment – David Kelly.

No public comment was provided.


Mr. Newton presented the pension trust fund actuarial valuation as of August 31, 2016. Mr. Newton noted a liability loss this year, it is the first liability loss since 2007. Mr. Newton reported that, in the past, running liability gains have typically been from salaries. He said there is an assumption that salaries will grow at a certain rate, naturally driving liability growth because members’ benefits are a function of their salary at retirement. Mr. Newton stated salaries grew a little bit faster than expected. The unfunded liability grew from about $33 billion to $35.5 billion. Mr. Newton reported the funded ratio is below 8 percent. Mr. Newton noted the funding period is now a 35-year period.

Mr. Newton stated it is the population growth from the last ten years that has helped sustain the TRS plan. He then compared TRS to all 50 plans nationwide that have teachers as members.

Mr. White provided a historical review of the following: investment returns; actuarial values of assets and liabilities; and funded ratio on smooth and market bases over the past decade. Mr. Newton also compared TRS’ funded ratio with that of other large public pension funds. He stated that TRS was at the two-thirds percentile. Mr. Newton noted that TRS’ return assumption of 8 percent was higher than its peers’ average of 7.5 to 7.75 percent.

Mr. Newton then discussed risk and discussed how it could be incorporated in analysis other than just investment risk. Mr. Newton also provided projections expected for the unfunded liability. He stated there needs to be better than anticipated investment experience, better than anticipated demographics experience, increased contributions, or just time to return back to the funding period of 30 years. Mr. Newton stated projections expect the unfunded to increase in nominal dollars over the next 15 to 25 years before they begin to decrease.

3. Provide opportunity for public comment – David Kelly.
Mr. Kelly, without objection, took up item 3 again and recognized Nancy Byler, Marcy Cann, Patricia Macias, LeRoy DeHaven, Tom Rogers and Bill Barnes as TRTA guests. Mr. Kelly expressed appreciation for their commitment year after year through their organization.

5. **Review the TRS-Care Actuarial Valuation and Other Post Employment Benefit (OPEB) reports as of August 31, 206 and receive an overview and update on TRS-Care and TRS-ActiveCare – Joseph Newton, Amy Cohen, and Eric St. Pierre; Gabriel, Roeder, Smith & Company**

Ms. Amy Cohen and Mr. Eric St. Pierre reviewed the current medical plans offered by the TRS-Care health benefits program for retired TRS members. Ms. Cohen stated that, in Fiscal Year (FY) 16, TRS-Care had an average of about 250,000 participants, a 3.2 percent increase over the FY 15 enrollment. She reported participation rates for the five health plan options under TRS-Care, noting that 63 percent of the participants were enrolled in TRS-Care 3, with over half of those being enrolled in Medicare Advantage plans. Ms. Cohen reported starting FY 2017 off with about 267,000 members, about a 2.8 percent increase over last year. Ms. Cohen noted the difference between Medicare and non-Medicare members. For a Medicare A&B person, CMS is paying the majority of the claims and TRS is paying on average about 16 percent.

Ms. Cohen reviewed TRS-Care funding sources for FY 16, $1.3 billion. The funding sources were: 55 percent from the state, active employees and districts percent of payroll contributions, 30 percent from retiree contributions and the balance came from federal programs and investment income.

Ms. Cohen reviewed the expenses for FY 16. The majority of the $1.63 billion expenses was for medical and pharmacy claims, 92.4 percent and the remainder was for administrative fees.

Ms. Cohen discussed the projected years. She noted FY 17 is the first year that the pharmacy claims is expected to be greater than the medical claims and projected this trend to continue out to 2021. This projection is based off of a 7 percent medical trend and a 12 percent pharmacy trend. Ms. Cohen stated if the trends play out there is a projected surplus of $230 million for FY 17 but after that there are projected shortfalls. For FY 18 there is a projected $335 million and by the end of the next biennium over a $1 billion shortfall.

Ms. Cohen reviewed ActiveCare and the different plans. She reported about 90 percent of the eligible districts, 1,095 district, participate in ActiveCare. She noted that the minimum state and district contribution have not increased, over time the employees are picking up the increased cost over years. She said for FY 17 if the district is contributing the minimum, the employees are picking up 65 percent of the cost of ActiveCare 2 employee only coverage. Ms. Cohen stated the cost drivers for ActiveCare are similar to those of Care.

6. **Receive an update on the TEAM Program and revised schedule – Brian Guthrie.**

Mr. Guthrie presented the monthly transparency report for October. The October report, he said, showed improvement since September the major achievement being the unveiling of the new TRS website. Mr. Guthrie then reviewed the factors going into the overall grade of B for October such as budget, schedule and quality. Mr. Guthrie reported the implementation of the
new program phase, Phase 1C, with Hewlett Packard Enterprise (HPE). He announced that about 90 percent of the reporting entities had started the certification process, with almost half having completed it. Mr. Guthrie reported the overlap between Phase 1 and Phase 2 was beginning. He said it is a critical time due to the finite amount of resources.

Mr. Guthrie discussed organizational change management (OCM). He explained the purpose and importance of OCM.


Mr. Michael Johnson reported their team has been working collaboratively with the project management group and with the executive team on the TEAM transparency report. Mr. Johnson stated two critical success factors were the finalization of the HPE contract negotiations and incorporation of lessons learned so far into the next phases of the project. Mr. Johnson then reported that the Independent-Program-Assessment budget was sufficient. In response to Mr. Kelly’s inquiry, Mr. Johnson endorsed the new format of the TEAM transparency report.

8. Receive an update on the Joint Select Committee on TRS Health Benefit Plans – Brian Guthrie, Katrina Daniel

Mr. Guthrie stated the Texas Legislature's Joint Interim Committee to Study TRS Health Benefit Plans had recently issued its report on TRS-Care and TRS-ActiveCare. He emphasized that the report was a starting point for the Legislature's consideration of potential solutions and options for those programs. Mr. Guthrie then provided a high level overview of what the committee did and its report. Mr. Guthrie stated the committee proposed reforms assuming current funding levels, retirees paying something, and availability of market coverage through public exchanges like those under the Affordable Care Act.

Mr. Guthrie noted that the committee made a similar recommendation for ActiveCare to consist of a single level of catastrophic coverage. He noted the committee found that offering different tiers of coverage was a luxury that could no longer be afforded under the models laid out.

Mr. Guthrie described the recommendations for ActiveCare. The first recommendation, he said, was to eliminate tiered levels of coverage for ActiveCare and to offer only catastrophic coverage. The other recommendation, he explained, was to turn ActiveCare into what it was initially intended for – a health-benefit plan for small and medium-sized districts that could not get coverage on their own. He said the committee recommended that ActiveCare only be made
available to districts with 1,000 or fewer employees and that those districts would have a one-time opportunity to opt out of the program.

9. `Discuss the Executive Director’s report on the following:
   A. Administrative operational matters, including updates on the following: Executive Director’s goals, financial awareness project, audit, legal, staff services, investments, board administration, special projects, actuarial matters and strategic planning.
   B. Board operation matters, including a review of draft agendas for upcoming meetings.
   C. Event notices or reminders; holiday and other schedules of interest; board member, employee, or other individual recognitions; and expressions of thanks, congratulations or condolences.

Mr. Guthrie provided some general updates. He announced TRS once again was named a Top Workplace for 2016. Mr. Guthrie discussed the beginning of the legislative session and how the new members of the Board will go through Senate confirmation. Mr. Guthrie announced the retirement of Jennifer Downey and Tom Guerin who have worked directly with the Board at times during their years of service. Mr. Guthrie discussed the upcoming February meeting and possible agenda items for it.

10. Discuss and consider investment matters, including: Performance Review: Third Quarter 2016 – Steve Voss and Mike Comstock, Aon Hewitt.

Mr. Mike Comstock presented the trust performance review on a year-to-date basis through September 30, 2016, including market returns, market value change, asset allocation, and total fund performance. Mr. Comstock reported a strong third quarter, with the trust earning 3.9 percent and adding value of 25 basis points relative to the benchmark, which was up 3.7 percent. Mr. Comstock then provided more detail on major indices to help provide a truer picture of performance. He noted emerging markets turned the corner back in February, with a performance of 16 percent for the year-to-date. Mr. Kelly discussed hedge-fund performance with Mr. Comstock, Mr. Voss, and Mr. Harris.

Mr. Comstock reviewed the actual allocations and stated the assets are within their ranges. He noted the treasuries were underweight by 2.2 percent, 9.7 relative to the 11.9 interim target. Mr. Comstock noted the underweight of treasuries was an additive during the quarter. Mr. Comstock provided an update as to the fourth quarter.

At 1:03 p.m., Mr. Kelly announced the Board meeting would stand recessed until the next morning in order to take up the noticed committee meetings.
The Board of Trustees of the Teacher Retirement System of Texas reconvened on December 2, 2016, in the boardroom located on the fifth floor of the TRS East Building offices at 1000 Red River Street, Austin, Texas. The following board members were present:

David Kelly, Chair
Karen Charleston
David Corpus
John Elliott
Christopher Moss
Anita Palmer

Others present:

Brian Guthrie, TRS
Ken Welch, TRS
Don Green, TRS
Carolina de Onis, TRS
Katrina Daniel, TRS
Amy Barrett, TRS
Toma Miller, TRS
Jamie Pierce, TRS
Ann Zigmond, TRS
Cindy Haley, TRS
Scott Leith, TRS
Michelle Schwietzer, TRS
Gloria Nichols, TRS
Jacki Herbovitz, TRS
Aidet Cooper, TRS
Katherine Farrell, TRS
Chase Dierschke, TRS
Heather Traeger, TRS

LeRoy DeHaven, TRTA
Tom Rogers, ARTA
Ted Melina Raab, Texas AFT
Ann Fickel, TCTA
Trevor Simmons, LBB
Sabina Rahman-Garcia, Humana
Surrenda Jones, Humana
Tiffany Calderon, Humana
Pat Del Rio, Aetna
Ajay Dalal, ESI
Carol Hamilton, Truven
Keith Gail, Truven
John Mekla, Truven
Amy Quertermous, Truven

Mr. Kelly called the meeting to order at 10:00 a.m.

1. Call role of Board members.
Ms. Farrell called the roll. A quorum was present. Ms. Ramirez and Mr. Colonnetta were absent.

No public comment was provided.

Ms. Jamie Pierce presented the Comprehensive Annual Financial Report (CAFR) for fiscal year 2016. Ms. Pierce announced that TRS received an unqualified opinion, or a clean audit on its
financial report. She also announced this was TRS’ 26th consecutive year to receive a certificate of Achievement for Excellence in Financial Reporting from the Government Finance Officers Association.

Ms. Cindy Haley provided financial highlights from the CAFR. She stated the pension trust fund had an ending net position or equity of $134 billion for fiscal year (FY) 2016, a 4.2 percent increase over FY 2015. She reported investment gains of $9.2 billion, a return rate of 7.38 percent for FY 2016, as compared to a negative 0.3 percent return for FY 2015. Ms. Haley noted the investment costs were about $159 per member and the benefit administration expenses were $29 per member. She reported the current membership grew by 28,521 and the retiree membership increased by over 16,176.

Ms. Ann Zigmond reviewed the health care funds. She reported the net assets for TRS-Care ended the FY 2016 at $641.5 million, a $331.4 million decrease from FY 2015. She stated that enrollment in TRS-Care grew 34 percent, increasing to 261,528 individual participants. She reported the net assets for TRS-ActiveCare were $53.6 million in FY 2016, a decrease of $34.3 million from FY 2015. She noted enrollment in TRS-ActiveCare had increased to 484,316 individual participants, a 1.3 percent increase, with 1,101 participating entities.

Mr. Scott Leith reported on two investment-related changes in this year’s CAFR. The first was the implementation of a new standard pronounced by the Governmental Accounting Standards Board (GASB), GASB Statement No. 72 on fair value measurement and application. Mr. Leith explained that GASB 72 required more detailed information on investments and the valuations underlying those investments than TRS had previously reported.

Mr. Leith reported the second change was the modification to the investment manager fee disclosure to make it more complete and readable. He said there was a break-down of the fees by those paid directly by the trust and fees taken out of the net asset value.

13. Review the reports of the Chief Financial Officer regarding expenditures, current financial review, and other financial matters involving TRS programs – Don Green.

Mr. Don Green reported on the first two months of the fiscal year – September and October 2016. He stated with 17 percent of the year completed, the expenditures to date were about 10.8 percent of the annual budget on a straight line basis. He noted that percentage did not reflect encumbrances. Mr. Green noted that TRS was nearing its the full time employee (FTE) cap of 503.3. He reported the FTE growth was mostly in Benefit Services, where TRS was trying to improve hold times for participant telephone calls.

Mr. Green announced for the first time TRS received the Government Finance Officers Association Distinguished Budget Presentation Award.

14. Receive the Deputy Director’s report, including matters related to administrative, financial and staff services operations – Ken Welch.

Mr. Ken Welch reported in Benefit Services ended October with an average speed of answering of two minutes and three seconds, three seconds over the target. He stated in November, the hold
time was up around five minutes. He noted the reasons for that were the increase in calls and the number of vacancies on staff. He reported 11 new counselors were hired since the beginning of November and are in training. Mr. Welch noted part of the call volume relates to the changes in health care. Mr. Welch reported email communications is now available to the counselors for the first time ever, which is an adjunct of the TEAM initiative. Mr. Welch also reported remote counseling is fully operational and is continuing to progress and work well.

Mr. Welch reviewed activities occurring around the agency such as the successful State Employees Charitable Contribution campaign and service awards. Mr. Welch recognized the Golden Apple service award recipients: Elizabeth Hemond, Bryan Eargel, Linda Davis, Rachael Hill, Lulu Llano and Jan Engler. Mr. Welch also recognized Billy Lowe, who was named by the Texas CIO Academy as IT Manager of the Year.

15. Receive the report of the Investment Management Committee on its December 1, 2016, meeting – David Kelly.

Mr. Kelly, the acting Committee Chair, provided the following report of the Investment Management Committee:

The Investment Management Committee met on December 1, 2016. The first presentation was a review of the risk management strategy given by Jase Auby and James Nield. Following, there was a presentation given by Mohan Balachandran with the review of asset allocation.

16. Receive the report of the Policy Committee on its December 1, 2016, meeting and consider the following related matters – David Corpus:

A. Adoption of the proposed amendments of the following TRS rules in Title 34, Part 3 of the Texas Administrative Code:
   i. § 23.7, relating to the Code of Ethics for Contractors.
   ii. § 23.8, relating to Expenditure Reporting by Certain Contractors.
   iii. § 25.24, relating to Performance Pay.
   iv. § 25.31, relating to Percentage Limits on Compensation Increases.
   v. § 25.303, relating to Calculations of Actuarial Cost for Purchase of Compensation Credit
   vi. § 29.83, relating to Calculation of Amount of Retirement Benefit.

B. Consider proposed amendments to the Soft Dollar Policy.

C. Consider proposed amendments to the Securities Lending Policy.

Mr. Corpus, the Committee Chair, provided the following report of the Policy Committee:

The Policy Committee met on December 1, 2016. The committee approved the proposed minutes of the September 22, 2016 meeting. The committee recommended to the Board adoption of proposed amendments to the Securities Lending Policy. The committee recommended to the Board adoption of proposed amendments to the Soft Dollar Policy. The committee recommended to the Board adoption of the proposed amendments to TRS rules in Title 34, Part 3 of the Texas Administrative Code.
Mr. Corpus, joined by Ms. Palmer, moved and the Board adopted the three proposed resolutions adopting amendments to TRS rules in Title 34, Part 3 of the Texas Administrative Code, as listed on the meeting agenda and recommended by the Policy Committee.

Resolution Adopting Amendments to
TRS' Code of Ethics Rules 34 Tex. Admin Code § 23.7 and § 23.8

Whereas, Section 825.212(a) of the Texas Government Code requires the Teacher Retirement System of Texas Board of Trustees (Board) to adopt a Code of Ethics (Code), including standards of ethical conduct and disclosure requirements, applicable to certain Teacher Retirement System of Texas (TRS) contractors, and Section 825.212(c) also requires TRS by rule or policy to adopt procedures for disclosing and curing violations of the common law of conflict of interests and any such rule or policy may specify time periods in which disclosures and cures must be completed;

Whereas, In compliance with § 825.212, the Board has adopted the Code;

Whereas, Section 2263.004 of the Texas Government Code requires the Board by rule to require certain TRS contractors, financial advisors and service providers to the retirement system to meet specified standards of conduct, and under this section, the Code requires that such TRS contractors file with the system a report detailing any expenditure of more than $50 made on behalf of a trustee or employee of the system;

Whereas, The Board adopts the form used by contractors to report such expenditures, and the executive director provides an explanatory memorandum addressed to contractors to accompany the reporting form; moreover, in February 2016, the executive director approved a revised reporting memorandum, and, in June 2016, the Board adopted a revised reporting form;

Whereas, The proposed amendments to § 23.7 and § 23.8 reflect the current version of the Code as adopted by the Board and adopt by reference the latest versions of the executive director's reporting memorandum and the reporting form under the Code;

Whereas, As authorized by the Policy Committee of the Board, TRS published proposed amendments to TRS' Code of Ethics Rules, § 23.7 and § 23.8 for public comment in the October 28, 2016 issue of the Texas Register (41 TexReg 8515);

Whereas, The public has had at least 30 days’ notice of TRS’ intention to adopt the proposed amendments, and TRS received no comments; and

Whereas, The Policy Committee has recommended that the Board adopt the proposed amendments to TRS' Code of Ethics Rules, § 23.7 and § 23.8, and the Board desires to adopt the proposed amendments without changes to the published texts of the proposed rule; now, therefore, be it

Resolved, That the Board hereby:

1) Adopts amended TRS rule 34 Tex. Admin. Code § 23.7 and § 23.8, as published in the October 28, 2016 issue of the Texas Register (41 TexReg 8515);

2) Incorporates by reference into this Resolution, as though fully set out in it, the applicable committee and Board meeting materials, discussions and actions, including the approved rule text
and reasoned justification for its adoption as presented in those meeting materials, discussions and actions;

3) Grants the TRS staff authority to prepare and to file all documents required by this Resolution, to work with the Office of the Secretary of State in preparing and filing such documents, and to make any technical changes required for publication of the adopted rule; and

4) Grants the Board chairman the authority to sign an order reflecting the action of the Board.

Resolution Adopting Amendments to
Membership Credit in 34 Tex. Admin. Code §§ 25.24, 25.31, and 25.303

Whereas, Section 825.102 of the Texas Government Code authorizes the Teacher Retirement System of Texas (TRS) Board of Trustees (Board) to adopt rules for eligibility for membership, the administration of the funds of the system, and the transaction of business of the board and § 825.110 of the Texas Government Code requires the Board to adopt rules that include a percentage limit on increases in annual compensation during a member’s final years of employment;

Whereas, TRS rules 34 Tex. Admin. Code § 25.24 (Performance Pay), § 25.31 (Percentage Limits on Compensation Increases), and § 25.303 (Calculation of Actuarial Cost for Purchase of Compensation Credit) respectively address the crediting of performance pay, the determination of limits on compensation increases, and the calculation of the cost to purchase compensation credit;

Whereas, To clarify how TRS credits performance pay that was paid in the 2011-2012 school year; to more fairly address the intent of the Legislature to protect the trust fund from spikes in a member's salary in the final years before retirement by requiring that the base salary used to determine if spiking has occurred be a year in which service credit is awarded; and to clarify how TRS calculates the cost of purchasing compensation credit, TRS proposed amendments to 34 Tex. Admin. Code §§ 25.24, 25.31, and 25.303 and had the rule proposals published for public comment in the October 28, 2016 issue of the Texas Register (41 TexReg 8516);

Whereas, The public has had at least 30 days’ notice of TRS’ intention to adopt the proposed amendments, and TRS received no comments; and

Whereas, The Policy Committee of the Board (Committee) has recommended that the Board adopt the proposed amendments to 34 Tex. Admin. Code §§ 25.24, 25.31, and 25.303, and the Board desires to adopt the proposed amendments without changes to the published texts of the proposed rules; now, therefore, be it

Resolved, That the Board hereby:

1) Adopts amended TRS rules 34 Tex. Admin. Code §§ 25.24, 25.31, and 25.303, as published in the October 28, 2016 issue of the Texas Register (41 TexReg 8516);

2) Incorporates by reference into this Resolution, as though fully set out in it, the applicable committee and Board meeting materials, discussions and actions, including the approved rule text and reasoned justification for its adoption as presented in those meeting materials, discussions and actions;
3) Grants the TRS staff authority to prepare and to file all documents required by this Resolution, to work with the Office of the Secretary of State in preparing and filing such documents, and to make any technical changes required for publication of the adopted rule; and

4) Grants the Board chairman the authority to sign an order reflecting the action of the Board.

Resolution Adopting New
34 Tex. Admin. Code § 29.83, relating to Calculation of Amount of Retirement Benefit

Whereas, Section 803.401(a) of the Texas Government Code authorizes the Board of Trustees (Board) of the Teacher Retirement System of Texas (TRS) to adopt rules it finds necessary to implement the Proportionate Retirement Program provided by Chapter 803 of the Texas Government Code, and § 825.102 of the Texas Government Code authorizes the Board to adopt rules for the administration of the funds of the retirement system and for the transaction of the business of the board;

Whereas, Proposed new TRS rule 34 Tex. Admin. Code § 29.83 addresses the calculation of the amount of a retirement benefit under the Proportionate Retirement Program;

Whereas, To address how service credit maintained in another system participating in the Proportionate Retirement Program will be used in determining the early-age reduction factor applied to a member’s service retirement benefit, TRS proposed new 34 Tex. Admin. Code § 29.83 and had the rule proposal published for public comment in the October 28, 2016 issue of the Texas Register (41 TexReg 8519);

Whereas, The public has had at least 30 days’ notice of TRS’ intention to adopt the proposed amendments and TRS received no comments; and

Whereas, The Policy Committee of the Board (committee) has recommended that the Board adopt new 34 Tex. Admin. Code § 29.83, relating to Calculation of Amount of Retirement Benefit, and the Board desires to adopt the proposed new rule without changes to the published text of the proposed rule; now, therefore, be it

Resolved, That the Board hereby:

1) Adopts new TRS rule 34 Tex. Admin. Code § 29.83, as published in the October 28, 2016 issue of the Texas Register (41 TexReg 8519);

2) Incorporates by reference into this Resolution, as though fully set out in it, the applicable committee and Board meeting materials, discussions and actions, including the approved rule text and reasoned justification for its adoption as presented in those meeting materials, discussions and actions;

3) Grants the TRS staff authority to prepare and to file all documents required by this Resolution, to work with the Office of the Secretary of State in preparing and filing such documents, and to make any technical changes required for publication of the adopted rule; and

4) Grants the Board chairman the authority to sign an order reflecting the action of the Board.
Mr. Corpus, joined by Mr. Moss, moved and the Board adopted the proposed amendments to the Securities Lending Policy as recommended by the Policy Committee.

Mr. Corpus, joined by Dr. Gibson, moved and the Board adopted the proposed amendments to the Soft Dollar Policy, as recommended by the Policy Committee.

17. Receive the report of the Risk Management Committee on its December 1, 2016, meeting. – Karen Charleston.

Ms. Charleston, the Committee Chair, provided the following report of the Risk Management Committee:

The Risk Management Committee met on December 1, 2016. Risk Management and Strategic Planning staff provided a report on the enterprise risk management function, which included an update on the stoplight report and related enterprise risk management activities. In addition, Information Technology staff provided an overview of cybersecurity.

At 9:30 a.m., Mr. Kelly announced the Board meeting would stand recessed in order to take up the noticed audit committee meeting.

At 11:13 a.m., Mr. Kelly reconvened the Board meeting

18. Receive the report of the Audit Committee on its December 2, 2016, meeting – Chris Moss.

Mr. Moss, the Committee Chair, provided the following report of the Audit Committee:

The Audit Committee met at 9:30 on Friday, December 2, 2016, in the 5th Floor Boardroom. The State Auditor’s staff presented the results of the audit of TRS’s Comprehensive Annual Financial Report for fiscal year 2016. Health Insurance Benefits staff and representatives from Truven Health Analytics presented the results of four audits of TRS health plans and drug administration for TRS-Care and TRS-ActiveCare. Compliance staff presented routine compliance reports. Internal Audit staff presented the results of projects, including the quarterly investment compliance testing, 403 (b) program audit, records management follow-up audit, prior audit and consulting recommendations status, and the Internal Audit annual report.

TRS staff presented the status of the automation projects and an overview of the new application for calculating incentive pay. CAE presented audit administrative reports, including chief audit executive performance goals for fiscal year 2017 and staff accomplishments.

19. Review the report of the General Counsel on pending and contemplated litigation, including updates on litigation involving benefit-program contributions, retirement benefits, health-benefit programs and open records – Carolina de Onis.
This agenda item was not taken up.

20. Consider personnel matters in Executive Session, including the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of a public officer or employee – David Kelly.

This agenda item was not taken up.

21. Consult with the Board’s attorney(s) in Executive Session on any item listed above on this meeting agenda as authorized by Section 551.071 of the Texas Open Meetings Act (Chapter 551 of the Texas Government Code). – David Kelly.

This agenda item was not taken up.

At 11:15 a.m., Mr. Moss moved, Mr. Corpus seconded, and the Board unanimously voted to adjourn.


ATTESTED BY:

_________________________________________   _________________________
Katherine H. Farrell     Date
Secretary to the TRS Board of Trustees
TAB 5
Moving Forward to Better Serve Our Members

TEAM PROGRAM: Adam Fambrough, Chet Henry, David Cook
TEAM Prequel – David Cook
TEAM Moving Forward – Chet Henry
TRUST Overview & Demo – Adam Fambrough
TEAM PROGRAM – Prequel

Why TEAM?

- The estimated life cycle of a major application is 3 to 5 years. (this includes system upgrades / patches)*
- After 5 years of maintenance many systems have evolved to a point at which additional enhancements or fixes are very time consuming and turn out to be very expensive.*

- The risk metric of 72 reflects an average for GLAS, BEVO, MEMR, LGRS, PADR, ALTP, ANPA, RETP, DCLM, REF and SSBB.
- A large number of the current IT projects are focused on moving the applications to new technologies for “Survival.”
- One of these projects, the conversion of databases from VSAM to DB2 at the current pace could take decades to deliver.
Why TEAM?

• Improved technology
• Improved business processes
• More member self service
• Integrated solution with single source of truth
What Are We Creating

• CRM – Single View of Customer
• Improved member self-service and e-Signature functionality
• New communication methods
  o Chat
  o Text messaging
• Full Payroll Reporting
• More frequent payment processing
• Direct Deposit for Refunds
• Improved online error correction for employer reporting
• Improved technical architecture
What Are We Creating

TEAM Projects

Pension System
Financial System
Website Redesign

Business Rules
Data Management
• Assessment
• Conditioning

Organizational Change Management
Reporting Entity Outreach
Business Procedures and Training

Decommissioning
Maintenance & Enhancements
Quality Assurance

TRS Enterprise Application Modernization
What Have We Done Thus Far

• **Data Conditioning**
  o Data improvement and completed contract with Data Conditioning Vendor early

• **Financial System Replacement**
  o Performed envision pilot with vendor and decided it was not good fit for TRS
  o CAPPS scheduled to start in FY18 (September 2017)

• **Website Redesign**
  o Completed in September
• Reporting Entity Outreach
  o Over 95% of employers have certified to use the new system

• Decommissioning and Bridging
  o Legacy applications ready to be turned off at Phase 1 Go Live

• Technical Infrastructure improvements
  o Storage
  o Enterprise Service Bus
Schedule History

- **Estimated March 2017**
  - Prior to any contracts being signed
- **Process Improvement Phase (PIP)**
- **Moved to May 2018**
- **Now August 2019**
Costs

- **Estimated $93 million**
  - Prior to any contracts being signed
- **Now $120 - $125 million**
- **Covered within current and requested budget**
TEAM PROGRAM – Budget and Schedule History

Factors

• Early Estimations
• New Accounting Requirements
• Extended Schedule
  o Extra years of FTEs
  o Extra years of contract
• Health Insurance Changes and TRS Taking Ownership
LOB Project (HPE Contract)
Actual vs Projected Cumulative Expenditures*

* Includes $7.2 million contingency

Through January 2017
Through January 2017
• Program Status
• Rules of engagement
• Key Milestones
TEAM PROGRAM – Moving Forward

TEAM Transparency Report - Project Execution Score

- September
  B-

- October
  B

- November
  B+

- December
  B+

- January
  B

09/2016 10/2016 11/2016 12/2016 01/2017 02/2017 03/2017
# Project Execution Score Categories

**Overall Project Execution Trend**

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<td>B+</td>
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**Individual Assessment Trend**

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</table>
Phase 2 DLR Sessions Start
01/23

User Acceptance Testing Preparation
02/21

Feature Freeze for Phase 1
02/28

Beta Testing Start
03/20

User Acceptance Testing (UAT) Start
04/17
TEAM PROGRAM – Moving Forward

TEAM – Key Milestones

• Schedule
• Continuous improvement
• Risks & Mitigations

Phase 2 DLR Sessions Start

01/23
TEAM PROGRAM – Moving Forward

TEAM – Key Milestones

- User Business Testing (UBT)
- Defect Burn-down
- Risks & Mitigations
TEAM PROGRAM – Moving Forward

TEAM – Key Milestones

- Change control
- Highest priority items
- Risks & Mitigations

Feature Freeze for Phase 1

02/28
TEAM PROGRAM – Moving Forward

TEAM – Key Milestones

- Full payroll reporting
- Good for Reporting Entities
- Good for TRS
- Risks & Mitigations

Beta Testing Start 03/20
TEAM PROGRAM – Moving Forward

TEAM – Key Milestones

- User Acceptance Testing (UAT)
- Quality Gate
- Risks & Mitigations
**Phased implementation with two major deployments**

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<th>Phase 1</th>
<th>Phase 2</th>
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<td>Employer Reporting (including new employer portal)</td>
<td>Benefit Estimates (retiree death)</td>
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<td>Member Account Maintenance</td>
<td>Retirement Processing</td>
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<td>Service Credit</td>
<td>Retirement System Transfer</td>
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<td>Service Credit Purchase</td>
<td>Death Claims</td>
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<td>Refunds</td>
<td>Annuity Payroll</td>
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<td>Benefit Estimates (retirements &amp; active member deaths)</td>
<td>Benefit Adjustments</td>
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<td>Cash Receipts</td>
<td>Tax Reporting</td>
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<td>Check Payments</td>
<td>New Member Web Self Service</td>
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<td>Annual Statements</td>
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TAB 6
Moving Forward
to Better Serve Our Members

Executive Director’s Report, Brian Guthrie
Overview

• Strategic Plan and Executive Director’s Goals.
• TRS History and Operations.
• Focusing on the Right Things.
• Proposed Executive Summary of Board Agenda Items.
• Legislative Update.
• Board Election and Training Calendar.
• Upcoming Agendas.
Strategic Plan and Executive Director’s Goals
Goal 1: Sustain a financially sound pension trust fund.

Goal 2: Continuously improve our benefit delivery.

Goal 3: Facilitate access to competitive, reliable health care benefits for our members.

Goal 4: Attract, retain, and develop a highly competent staff.

Goal 5: Promote purchasing selection practices that foster meaningful and substantive inclusion of historically underutilized businesses (HUBs).
## Executive Director’s Goals

<table>
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<tr>
<th>Performance Category</th>
<th>Executive Director’s Goal</th>
<th>Key Performance Indicator</th>
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</thead>
<tbody>
<tr>
<td><strong>Operational Excellence</strong></td>
<td>Continue to improve benefit delivery.</td>
<td>Deploy the line of business for TEAM Phase 1A.</td>
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<tr>
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<td></td>
<td>Work with reporting entities and state-wide stakeholders on TEAM Phase 1B implementation.</td>
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<td>Validate commitments and define high-level requirements and use cases for TEAM Phase 2.</td>
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<tr>
<td></td>
<td>Implement records management improvement.</td>
<td>Progress through the fiscal year 2017 identified steps of the records management.</td>
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<tr>
<td></td>
<td>Maintain and increase the TRS national profile.</td>
<td>Serve on NCTR and NASRA Executive Committees.</td>
</tr>
<tr>
<td></td>
<td>Develop and implement a plan for increasing the use of HUBs through purchasing contracts and subcontracts</td>
<td>Follow CPA guidelines on soliciting HUBs.</td>
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<tr>
<td></td>
<td></td>
<td>Solicit HUBs from existing statewide contracts when possible.</td>
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<td></td>
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<td>Conduct annual HUB forum.</td>
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<td></td>
<td></td>
<td>Implement revised contracting guidelines through updated procedures.</td>
</tr>
<tr>
<td>Performance Category</td>
<td>Executive Director’s Goals</td>
<td>Key Performance Indicator</td>
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<tr>
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<tr>
<td>TRS Leadership</td>
<td>Continue to develop effective recruitment/retention strategy</td>
<td>Continue to execute the workforce plan.</td>
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<tr>
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<td>Review and adjust as necessary the agency wide schedule for performance evaluations or 360 assessments.</td>
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<td>Continue to be an employer of choice.</td>
</tr>
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<td></td>
<td>Take the next step in talent management and develop bench strength for all key positions as part of a long-term succession plan.</td>
</tr>
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<td></td>
<td>Improve mentorship and coaching skills and work with Executive Council members to create their own individual development plans.</td>
</tr>
<tr>
<td></td>
<td>Promote a strong workplace culture.</td>
<td>Research and identify a unique Executive Council team building opportunity and reexamine with Executive Council its reporting lines and structure.</td>
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<td></td>
<td>Identify additional opportunities to increase visibility and interact with all TRS staff such as more “huddles,” “all hands on deck” meetings, or participation in departmental team building.</td>
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<td></td>
<td>Update the strategic plan and continue to track accomplishments and integrate resource and strategic planning.</td>
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<td></td>
<td>Provide a physical work environment that enhances productivity.</td>
<td>Continue to update TRS facilities as needed to ensure effective space utilization.</td>
</tr>
<tr>
<td>Performance Category</td>
<td>Executive Director’s Goals</td>
<td>Key Performance Indicatory</td>
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<tr>
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</tr>
<tr>
<td>Investment Management</td>
<td><strong>Continue trust fund earnings growth.</strong></td>
<td>Outperform TRS benchmarks net of fees.</td>
</tr>
<tr>
<td></td>
<td>Maintain an effective working relationship with legislative stakeholders on trust issues.</td>
<td>Maintain the trust asset allocation in accordance with investment policy.</td>
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<td></td>
<td></td>
<td>Continue work toward becoming the preferred destination for large and attractive long-term investments.</td>
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<td></td>
<td>Continue to build out compliance activities.</td>
</tr>
<tr>
<td></td>
<td>Engage legislature on issues such as investment authority, actuarial valuation and plan design.</td>
<td>Throughout the state budget process emphasize the importance of maintaining new state and member contribution rates and appropriate funding levels.</td>
</tr>
<tr>
<td></td>
<td>Position the agency for the sunset review process taking place in the 2018-2019 review cycle – 86th Legislature</td>
<td>Review best industry practices relating to pension funding goals, long-term sustainability, and measuring financial health.</td>
</tr>
<tr>
<td>Performance Category</td>
<td>Executive Director’s Goals</td>
<td>Key Performance Indicator</td>
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<td>------------------------------------------------------------------------------------------</td>
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<tr>
<td>Benefit Services</td>
<td>Improve web site accessibility.</td>
<td>Complete the redesign of the TRS website using mobile-friendly responsive design.</td>
</tr>
<tr>
<td></td>
<td>Provide TRS mission-centric and broader communication to stakeholders.</td>
<td>Update the agency wide communications plan.</td>
</tr>
<tr>
<td></td>
<td>Build and maintain strong, customer-focused relationships.</td>
<td>Develop health care informational videos supporting increased health care literacy and consumer awareness.</td>
</tr>
<tr>
<td>Health Care</td>
<td>Manage the expenses and revenues of TRS-Care and TRS-ActiveCare.</td>
<td>Monitory adequacy of provider networks.</td>
</tr>
<tr>
<td></td>
<td>Research and communicate the merits of long-term sustainability solutions for TRS-Care and affordability for TRS-ActiveCare</td>
<td>Monitor TRS-ActiveCare enrollment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor implementation of the Affordable Care Act.</td>
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<tr>
<td></td>
<td></td>
<td>Serve as a resource of the Joint Select Legislative Committee in creating options to address health care challenges.</td>
</tr>
</tbody>
</table>
TRS History and Operations
Overview of TRS Programs

**Pension**
- 1.1M Active Members.
- 394K Retirees.
- 33.6 Year Funding Period.
- 8.41% Five-Year Rate of Return.
- 79.7% Funded Ratio
- $35.4B UAAL.

**Health Care**
- 262K TRS-Care Members.
- TRS-Care Funding (% of active payroll):
  - state 1%
  - districts 0.55%
  - actives 0.65%
  - member premiums
- 484K TRS-ActiveCare Members including HMOs.
- Funding:
  - state $75 per Month
  - districts $150+ per Month
  - member premiums

**403(b)**
- Fee limits set by TRS rules.
- Companies certify with TRS that products meet TRS fee specifications.
- Salary-reduction agreements available only for certified companies with registered products.
The above assumes all assumptions exactly met, including 8% annual investment returns
Assumes no changes to benefit policy
TRS Pension Fund Operations FY 2016

Incoming Activity
- $2.9B member deposits
- $3.1B state & employer deposits
- 712K incoming calls
- 9,249 1-on-1 member visits
- 172 presentations or group counseling sessions to members
- 1,332 monthly employer reports covering 828,851 employees
- 2.1M Website visits

Outgoing Activity
- $9.37B in pension benefit payments
- 39K refunds processed
- 36K retirement estimates prepared
- 22K new retirements processed
- 7,387 service purchase bills processed
- 10,299 death claims processed
- 40,919 callbacks
- 394 field counseling sessions

TRS Profile*
1.5M pension trust members
$134.0B net assets

*As of 8/31/2016
Cumulative Benefits Paid vs Contributions

Benefits paid exceeded contributions for first time in 1996; cumulative total of $33.9 billion since (through FY2016). Operating deficit dropped $88.1 million or 2.3% in FY2016.

*Actual through FY2016 and projected through FY2019.
Sources of Pension Fund Revenue (1938-2016)

- **Members**: $49.3 billion (19%)
- **Employer/State**: $50.0 billion (19%)
- **Investments**: $165.0 billion (62%)
Membership Growth, 10 Year Trend

- Actives – 19% growth
- Retirees – 48% growth
### Networks

**Medical**
- 51,045 Physicians
- 556 Hospitals
- 22,322 Other Providers

**Pharmacy**
- 5,111 Retail Pharmacies
- 3,187 Retail-Plus Pharmacies

### Transactions
- 4.9M Medical Claims Paid
- 4.5M Rx Claims Paid
- $1.75B Total Claims

### TRS-ActiveCare Profile
- 484K Covered Lives including HMOs
- 1,101 Participating Entities
- $53.6M in Fund Balance on 8/31/2016
<table>
<thead>
<tr>
<th><strong>Medical Network</strong></th>
<th><strong>Pharmacy Network</strong></th>
<th><strong>Transactions</strong></th>
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<tbody>
<tr>
<td><strong>TRS-Care Standard</strong></td>
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<tr>
<td>- 51,045 Physicians</td>
<td>- 4,437 Retail Pharmacies</td>
<td>- 6.3M Medical Claims Paid</td>
</tr>
<tr>
<td>- 566 Hospitals</td>
<td>- 1,690 Retail-Plus Pharmacies</td>
<td>- 7.9M Rx Claims Paid</td>
</tr>
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<td>- 22,322 Other Providers</td>
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<td>- $1.75B Total Claims</td>
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<tr>
<td><strong>TRS-Care Medicare Advantage</strong></td>
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<tr>
<td>- 30,325 Physicians</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 292 Hospitals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 12,373 Other Providers</td>
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<td></td>
</tr>
<tr>
<td><strong>TRS-Care Profile</strong></td>
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<tr>
<td>- 262K Covered Lives</td>
<td></td>
<td></td>
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<tr>
<td>- $614.5M in Fund Balance on 8/31/2016</td>
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### Financial History & Projections Through FY 2021 with Data Through November 2016

<table>
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<tr>
<th>Fiscal Year</th>
<th>Retiree Contributions</th>
<th>State Contributions</th>
<th>Supplemental Appropriations</th>
<th>Active Employee Contributions</th>
<th>District Contributions</th>
<th>Investment Income</th>
<th>CMS &amp; Part D Subsidies</th>
<th>ERPl Subsidy</th>
<th>Ending Balance (Incurred Basis)</th>
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<td>$0</td>
<td>$17,624,357</td>
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<td>$47,235,954</td>
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<td>FY 2006</td>
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<td>FY 2010</td>
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<td>$0</td>
<td>$70,264,085</td>
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<tr>
<td>FY 2011</td>
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<td>$0</td>
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<td>FY 2012</td>
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<td>$354,202,406</td>
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<td>FY 2013</td>
<td>$28,278,864</td>
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<td>FY 2014</td>
<td>$29,454,891</td>
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<td>FY 2015</td>
<td>$30,630,918</td>
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<td>$86,712,750</td>
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<td>FY 2016</td>
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<td>$417,996,578</td>
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<td>$89,992,483</td>
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</table>

**Notes:**
- Invoice data through November 30, 2016.
- This purpose of this report is to project revenue and expenses on an incurred basis and should not be used as a projection of cash flow.
- 69% participation in Medicare Part D plans, which were effective 1/1/2013.
- State Contribution rate of 1%; District Contribution rate of 0.5%; and Active Contribution rate of 0.65%.
- Total enrolment assumptions based on headcounts assumed in annual Other Post Employment Benefits (OPEB) valuation report.
- 6% payroll growth in FY2016, 3% payroll growth in FY2017 and FY2018; 2% increase in payroll growth thereafter.
- Medical trends: 7% for Care 1, 7% for Care 2, 7% for Care 3 through FY2017, reduced by 0.5% each year thereafter.
- Drug trend: 10% for Care 1, 10% for Care 2, 12% for Care 3, 12% for Medicare Part D plans, reduced by 0.5% each year thereafter.
- Interest Rate: 0.40%
- Medicare Part D Risk Score of 0.870 beginning January 1, 2016.
403(b) Registration Program

Allowable Fees
- 6% combined front-and back-end sales load
- 2.75% asset-based (annually)
- 10% surrender/withdraw
- $50 loan Initiation
- $50 administrative (annually)

Operations
- Maintain and update web site for members to compare products
- 76 certified companies
- Over 11,000 registered product options

Funding
- State law allows fees for program sustainability
- $3,000 per certification and per registration
- Certification and registration renewed every five years
Focusing on the Right Things
Focusing on the Right Things

Focusing on the right things entails:

• Setting the mission and vision, which includes understanding the organizational profile.
  • E.g. Who are our key customers? What are our primary services? What are our strategic advantages and challenges? What are our external requirements (Texas Constitution and statutes) and internal requirements (rules, Board Bylaws, and policies)?

• Ensuring effective governance structures.
  • Do our structures meet the external and internal requirements of the system with accountability, transparency in operations, protection of stakeholder interests, and audit assurance?

• Ensuring effective senior leaders.
  • How are senior leaders evaluated? Is succession planning addressed? Is the organizational structure effective?

• Ensuring effective legal and regulatory compliance.
  • Are the key compliance processes, measures, and goals for meeting regulatory and legal requirements appropriate?

• Ensuring the organization acts ethically, including meeting societal responsibilities.
  • How do we enable and monitor ethical behavior? How do we contribute to societal well being our key communities?
Proposed Executive Summary of Board Agenda Items
Action Item Example

Board Meeting Executive Summary Document

Agenda Item: 7
Staff Member Lead: Barbie Pearson
Estimated Time Allotment: 15 min.
Potential Fiscal Impact: N/A
Strategic Plan Alignment:
Goal 1: Sustain a financially sound pension trust fund.
Goal 2: Continuously improve our benefit delivery.

Action or Discussion Item: Action Items

Background Information: Each quarterly meeting the Chief Benefits Officer presents the minutes from the Medical Board meetings and the approved list of members qualified for retirement for that quarter for approval.

Key Matters for Consideration:
• Minutes of Medical Board for September and November 2016 meetings.
• List of members qualified for retirement for September through November 2016.

If Action, what is the Recommendation of Executive Director and Staff: Recommend approval of both:
7A) the Medical Board minutes for the September and November 2016 meetings; and
7B) list of members qualified for retirement for September through November 2016.

If Discussion, will there be future action requested: N/A

Recommended Language for Motion: The Board Chair after the CBO’s presentation asks if there is any discussion or questions. After discussion or if none then:
• Bd Chair: Is there a motion for approval of the Medical Board minutes for Sept. and Nov. 2016 meetings.
• Bd Chair: Is there a second motion for approval?
• Bd Chair: All those in favor / opposed?
• Bd Chair: Motion carries.

• Bd Chair: Is there a motion for approval of the members qualified for benefits for Sept. - Nov. 2016.
• Bd Chair: Is there a second motion for approval?
• Bd Chair: All those in favor / opposed?
• Bd Chair: Motion carries.
Discussion Item Example

Board Meeting Executive Summary Document
Agenda Item: 19
Staff Member Lead: Merita Zoga, Don Green
Estimated Time Allotment: 30 Minutes
Potential Fiscal Impact: TBD
Strategic Plan Alignment: The TRS budget impacts all of the strategic plan goals.
Goal 1: Sustain a financially sound pension trust fund.
Goal 2: Continuously improve our benefit delivery.
Goal 3: Facilitate access to competitive, reliable health care benefits for our members.
Goal 4: Attract, retain, and develop a highly competent staff.
Goal 5: Promote purchasing selection practices that foster meaningful and substantive inclusion of historically underutilized businesses.

Action or Discussion Item: Discussion Item

Background Information: The TRS budget is currently under consideration at the Legislature.

Key Matters for Consideration: The primary focus of this presentation is educational.

• Provide background on the legislative process and players.
• Provide overview of current Senate and House Budget proposals.
• Discuss anticipated TRS-related legislation.

If Action, what is the Recommendation of Executive Director and Staff: N/A

If Discussion, will there be future action requested: Yes, at the end of the legislative session, May 29, 2017, TRS will be required to enact the statutes resulting from the session, generally by the new fiscal year.

Recommended Language for Motion: N/A
Legislative Update
Legislative Hearings

• February 3, 2017 Senate Finance Committee Workgroup on Healthcare Cost Public Hearing
• February 1, 2017 Senate Finance Committee Public Hearing re: Health Care Costs
• January 24, 2017 Senate Finance Committee regarding TRS

Senate Nomination Committee:

• Sen. Brian Birdwell (Chair)
• Sen. Kirk Watson (Vice Chair)
• Sen. Dawn Buckingham
• Sen. Craig Estes
• Sen. Jose Menendez
• Sen. Borris L. Miles
• Sen. Van Taylor

Governor’s Directive on Hiring
• Joint interim legislative committee on TRS health benefit plans established after 84th Session to study both TRS-Care and ActiveCare.

• Hearings held on both TRS-Care and ActiveCare.

• Report to the Legislature issued in November 2016.

• Focus of the study is to examine and assess:
  • the financial soundness of the plans;
  • the cost and affordability of plan coverage; and
  • the sufficiency of access to physicians and health care providers under the plan.
SB 788 by Senator Huffman- HD option for TRS-Care Solvency:

- Funding for the plan would maintain current funding levels based on active payroll of: 1% state, 0.55% school districts, and 0.65% active employees.
- Eliminates a no-cost plan option for retirees.
- Provides that Medicare-eligible retirees (both A & B, and B only retirees) and their Medicare eligible dependents would be eligible to enroll in Medicare Advantage plan and Medicare Part D plan. This would be the only plan available to Medicare-eligible participants through TRS-Care. (Similar to current TRS-Care Medicare Advantage 2 level plan).
- The High Deductible (HD) Plan would provide a high deductible health plan for non-Medicare eligible participants. (Similar to TRS-Care 1).
- Beginning 1/1/2018 retiree premiums would be restructured varying by coverage tier and Medicare status of the retiree.
<table>
<thead>
<tr>
<th>Member Status</th>
<th>Estimated Retiree Count</th>
<th>Illustrative CY2018 Medical and Pharmacy Plan Design</th>
<th>Illustrative CY2018 Retiree Premiums</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Medicare members</td>
<td>54,861 retirees 21,805 dependents</td>
<td><strong>TRS-Care-HD</strong>&lt;br&gt;&lt;br&gt;<em>In-Network</em>&lt;br&gt;$4,000/$8,000 Deductible&lt;br&gt;$7,150/$14,300 MOOP&lt;sup&gt;1&lt;/sup&gt;&lt;br&gt;80%/20% coinsurance&lt;br&gt;<em>Out-of-network</em>&lt;br&gt;$8,000/$16,000 Deductible&lt;br&gt;$14,300/$28,600 MOOP&lt;sup&gt;2&lt;/sup&gt;&lt;br&gt;60%/40% coinsurance</td>
<td><strong>Non-Medicare Retirees</strong>&lt;br&gt;Retiree Only = $430&lt;br&gt;Retiree &amp; Spouse = $974&lt;br&gt;Retiree &amp; Child(ren) = $663&lt;br&gt;Retiree &amp; Family = $1,310</td>
</tr>
<tr>
<td>Medicare Part B Only members</td>
<td>17,074 retirees 553 dependents</td>
<td><strong>Medicare Advantage/Part D</strong>&lt;br&gt;$500 Deductible&lt;br&gt;$3,500 MOOP&lt;br&gt;80%/20% coinsurance&lt;br&gt;Copayments for IH Admit, OH Services, ER Visit, UC Visit, Lab and prescription drugs.</td>
<td><strong>Medicare Retirees</strong>&lt;br&gt;Retiree Only = $146&lt;br&gt;Retiree &amp; Spouse = $590&lt;br&gt;Retiree &amp; Child(ren) = $504&lt;br&gt;Retiree &amp; Family = $1,106</td>
</tr>
<tr>
<td>Medicare Part A&amp;B members</td>
<td>134,574 retirees 30,369 dependents</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> MOOP: Maximum Out-of-Pocket payment<br><sup>2</sup> MOOP: Maximum Out-of-Pocket payment
SB 789 by Senator Huffman: HD option for TRS-ActiveCare:

- Funding for the plan would maintain the $75 per month per employee from the state and the minimum of $150 per month per employee from the district.
- Offer a single high-deductible health plan (similar to TRS-ActiveCare 1-HD) for school districts and certain entities with 1,000 or fewer employees.
- This would be the only plan available. ActiveCare 2, ActiveCare Select, and HMO plans would no longer be offered.
- School districts and certain entities with more than 1,000 employees would not have the option to join and be responsible for their own plan.
- One single opt-out provision for eligible entities with no provision to opt-in at a later time.
- Network of medical providers limited to value-based purchasing models, such as Accountable Care Organizations where available. Broader network in the remainder of the state to allow sufficient choices for providers, especially for those located in rural areas.
- Network of pharmacies includes all pharmacies in the existing broad network.
- Changes proposed in bill to begin with the 2018 plan year, September 1, 2018.
## Legislative Update – SB 789: TRS-ActiveCare HD Illustrative Plan

<table>
<thead>
<tr>
<th>Member Status</th>
<th>Estimated Employee Count</th>
<th>Illustrative CY2018 Plan Design</th>
<th>FY2017 Gross Premium</th>
<th>Illustrative FY2018 Gross Premium</th>
</tr>
</thead>
</table>
| Districts with 1,000 or fewer employees (single opt-out option) | 164,048 employees 102,530 dependents | **TRS-ActiveCare-1HD**  
   *In-Network*  
   $2,500/$5,000 Deductible  
   $6,550/$13,100 MOOP  
   80%/20% coinsurance  
   *Out-of-network*  
   $5,000/$10,000 Deductible  
   $14,300/$28,600 MOOP  
   60%/40% coinsurance | Employee Only = $341 - $645  
   Employee & Spouse = $914 - $1,552  
   Employee & Child(ren) = $615 - $1,042  
   Employee & Family = $1,231 – $1,597 | Employee Only = $490  
   Employee & Spouse = $1,245  
   Employee & Child(ren) = $832  
   Employee & Family = $1,378 |
Board Elections and Training Calendar
Board Elections

Qualified Election Ballot Candidates:

At-Large Position Ballot
Hiram Burguete
Karen Charleston
Dr. Greg Poole
Nanette Sissney

Retiree Position Ballot
James Dick Nance
Mary Frances W. Plemmons

Ballots Printed and Mailed March 2017
Deadline for ballots to be counted May 5, 2017
Top three names with most votes for each position certified to Governor by end of May 2017
Governor appoints new Trustees Summer 2017

Deadline for ballots to be counted May 5, 2017
Top three names with most votes for each position certified to Governor by end of May 2017
Governor appoints new Trustees Summer 2017
<table>
<thead>
<tr>
<th>Month</th>
<th>Date</th>
<th>Event</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>April</td>
<td>19 – 20</td>
<td>TRS SPN Summit, Austin, TX</td>
<td>Austin, TX</td>
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<tr>
<td>April</td>
<td>18 – 19</td>
<td>Pension Bridge Annual, San Francisco, CA</td>
<td>San Francisco, CA</td>
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<tr>
<td>May</td>
<td>17 – 18</td>
<td>Aon Hewitt, “Explore the Possibilities,” Chicago, IL</td>
<td>Chicago, IL</td>
</tr>
<tr>
<td>July</td>
<td>19 – 20</td>
<td>TRS SPN Summit, New York, NY</td>
<td>New York, NY</td>
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<tr>
<td>July</td>
<td>23 – 26</td>
<td>NCTR Trustee Institute and Workshop, Harvard University, Boston, MA</td>
<td>Boston, MA</td>
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<tr>
<td>August</td>
<td>5 – 9</td>
<td>NASRA Annual Convention, Baltimore, MD</td>
<td>Baltimore, MD</td>
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<tr>
<td>October</td>
<td>7 – 11</td>
<td>NCTR Annual Convention, Loews Ventana Resort, Tuscan, AZ</td>
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<td>October</td>
<td>24 – 25</td>
<td>Introduction to Investments, Callan College, Chicago, IL</td>
<td>Chicago, IL</td>
</tr>
<tr>
<td>November</td>
<td>23 – 30</td>
<td>TRS SPN Summit, Austin, TX</td>
<td>Austin, TX</td>
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</tbody>
</table>
Upcoming Agendas
April 6 - 7, 2017 (2 Day Quarterly):

**Major Items Include:**
- Report on Q4 Earnings
- TEAM Update
- Opening foreign office update
- Records Management Update
- Cybersecurity
- TRS Facilities Update
- Global Pension Trends

**Committee Meetings:**

**Audit Committee**
- Compliance Reports
- Audit Reports

**Risk Management Committee**
- Internal Public Markets Review.
- Trading Management Group Presentation

**Policy Committee**
- Authorization to Approve and Sign Vouchers Internal Policy
- Authorize for Public Comment 403(b) Rule Amendment

**Investment Management Committee**
- Bi-Annual Risk Report
June 1-2, 2017 (2 Day Quarterly)

Major Items Include:
- Report on Q1 Earnings
- TEAM Update
- FY 2018 ED Goals for the Executive Incentive Pay Plan
- Proposed Rule Adoption for 403(b)
- Sunset Update
- Legislative Update

Committee Meetings:

**Audit Committee**
- TRS Contractor On/Off Boarding Report
- Compliance Report
- Internal Audit Report

**Benefits Committee**
- Recommend adoption of TRS-Care and TRS-ActiveCare Rates and Plan Design

**Budget Committee**
- FY 2017 Operating Budget (Discuss only – adopt in July)

**Investment Management Committee**
- Private Equity Review
- Real Assets Review
- Energy and Natural Resources Portfolio
- Private SPN Update

**Risk Management Committee**
- Enterprise Risk Management Update

**Policy Committee**
- Proposed Rule Adoption for 403(b)
**July 14, 2017**

**Major Items Include:**
- Adopt TRS FY 2018 Operating Budget
- Executive Evaluations
- Review of the Performance Incentive Pay Plan
- TEAM Update

**Committee Meetings:**
- **Audit Committee**
  - Evaluate the Chief Audit Executive
  - Compliance Report
  - Internal Audit Report

- **Budget Committee**
  - Recommend adoption of FY 2018 Operating Budget

**August 25, 2017**

**To Be Determined**
September 21-22, 2017
(2 Day Quarterly)
Major Items Include:
Report on Q2 Earnings
TEAM Update

Committee Meetings:

Audit Committee
Adopt the Annual Audit Plan

Investment Management Committee
External Public Markets Portfolio
Public SPN Update

Policy Committee
Update the Policy Review Schedule

Risk Management Committee
Bi-Annual Risk Report

October 27, 2017
To Be Determined
Major Items Include:
Comprehensive Annual Financial Report (CAFR)
TEAM Update
Pension Fund Valuation
TRS-Care Valuation (OPEB) Valuation
TRS-ActiveCare Benefits Briefing

Committee Meetings:

Audit Committee
Report on CAFR Audit

Investment Management Committee
Asset Allocation Group Presentation
Risk Group Presentation

Policy Committee
Review Trustee Ethics Policy and Position Description
Review Employee Ethics Policy
Review Conflict of Interest Disclosure Statement
Review Ethics Compliance Statement for Employees
Review Disciplinary Action Disclosure Statement

Risk Management Committee
Enterprise Risk Management
TAB 7
TEACHER RETIREMENT SYSTEM OF TEXAS
MEDICAL BOARD MEETING
OPEN SESSION AGENDA
SEPTEMBER 13, 2016

The Medical Board of the Teacher Retirement System of Texas met at 12:00 p.m. Tuesday, September 13, 2016 in the TRS offices.

The following members were present:

Dr. Alice Cox, Fredericksburg
Dr. James Allen Reinarz, Austin
Dr. Larry Wilson, Austin

Others present:

Ms. Barbie Pearson, Chief Benefit Officer
Mr. Adam Fambrough, Manager, Benefit Processing, TRS
Ms. Adrea Bridgeman, Assistant Manager, Benefit Processing, TRS
Ms. Vicki Rees, Legal Services, TRS
Ms. Denise Hope, Benefit Consultant, Benefit Processing, TRS

Dr. Wilson called the meeting to order at 12:18 p.m.

1. REVIEW OF MINUTES FROM THE JULY 12, 2016 MEETING.

   The minutes of the July 12, 2016 meeting were reviewed and approved.

2. CONSIDERATION OF FILES OF TRS MEMBERS WHO ARE CURRENTLY APPLYING FOR DISABILITY RETIREMENT AND THE FILES OF DISABILITY RETIREES WHO ARE DUE A RE-EXAMINATION REPORT.

   Dr. Wilson announced that the Medical Board would enter into Executive Session, as provided by section 551.078 of the Texas Government Code, to deliberate medical information of individual members and retirees.

   The Board entered into closed session at 12:26 p.m.
The meeting was re-opened at 12:43 p.m.

3. REVIEW OF DISABILITY STATISTICS.
4. DISCUSSION OF ITEMS TO BE PLACED ON FUTURE AGENDAS.

5. DISCUSSION OF THE DATE OF NEXT BOARD MEETING.

The next Medical Board meeting was scheduled for November 8, 2016. The meeting was adjourned at 12:55 p.m.

Dr. Larry Wilson, Chairman
TRS Medical Board

Attest:

Denise Hope
The Medical Board of the Teacher Retirement System of Texas met at 12:00 p.m. Tuesday, November 8, 2016 in the TRS offices.

The following members were present:

Dr. Alice Cox, Fredericksburg
Dr. James Allen Reinarz, Austin
Dr. Larry Wilson, Austin

Others present:

Ms. Barbie Pearson, Chief Benefit Officer
Mr. Adam Fambrough, Manager, Benefit Processing, TRS
Ms. Adrea Bridgeman, Assistant Manager, Benefit Processing, TRS
Ms. Becki Smith, Legal Services, TRS
Ms. Denise Hope, Benefit Consultant, Benefit Processing, TRS

Dr. Wilson called the meeting to order at 12:11 p.m.

1. REVIEW OF MINUTES FROM THE SEPTEMBER 13, 2016 MEETING.

The minutes of the September 13, 2016 meeting were reviewed and approved.

2. CONSIDERATION OF FILES OF TRS MEMBERS WHO ARE CURRENTLY APPLYING FOR DISABILITY RETIREMENT AND THE FILES OF DISABILITY RETIREES WHO ARE DUE A RE-EXAMINATION REPORT.

Dr. Wilson announced that the Medical Board would enter into Executive Session, as provided by section 551.078 of the Texas Government Code, to deliberate medical information of individual members and retirees.

The Board entered into closed session at 12:22 p.m.
The meeting was re-opened at 12:37 p.m.

3. REVIEW OF DISABILITY STATISTICS.
4. DISCUSSION OF ITEMS TO BE PLACED ON FUTURE AGENDAS.

Dr. Cox will do a presentation after the meeting on West Nile Virus.

5. DISCUSSION OF THE DATE OF NEXT BOARD MEETING.

The next Medical Board meeting was scheduled for January 10, 2017.
The meeting was adjourned at 12:53 p.m.

Dr. Larry Wilson, Chairman
TRS Medical Board

Attest:

Denise Hope
<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Payments</th>
<th>Gross Payment Total</th>
<th>Average Payment</th>
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</thead>
<tbody>
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<td>Service Retirees</td>
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<td>15,470,996.60</td>
<td>2,349.78</td>
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<td>Disability Retirees</td>
<td>235</td>
<td>278,063.43</td>
<td>1,183.24</td>
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<td>Survivor Benefits</td>
<td>277</td>
<td>69,350.00</td>
<td>250.36</td>
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<td>Survivor Benefit Lump Sum Payment</td>
<td>2,638</td>
<td>16,009,237.05</td>
<td>6,068.70</td>
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<tr>
<td>Life Annuity as Death Settlement</td>
<td>40</td>
<td>64,467.82</td>
<td>1,611.69</td>
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<td>60 Monthly Payments as Death Settlement</td>
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<td>58,629.66</td>
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<td>Refund of Deposit as Death Settlement</td>
<td>148</td>
<td>3,446,101.36</td>
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<td>Twice Annual Salary as Death Settlement</td>
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<td>11,276,128.42</td>
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<td>Lump Sum DROP Member Payment</td>
<td>4</td>
<td>1,465,531.69</td>
<td>366,382.92</td>
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<tr>
<td>5 Annual DROP Member Payments</td>
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<tr>
<td>10 Annual DROP Member Payments</td>
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<tr>
<td>60 Monthly DROP Member Payments</td>
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<tr>
<td>120 Monthly DROP Member Payments</td>
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<tr>
<td>DROP Payments to Beneficiary of Active Member</td>
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<tr>
<td>12 Month Partial Lump Sum Option Payment</td>
<td>406</td>
<td>13,420,458.72</td>
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<td>24 Month Partial Lump Sum Option Payment</td>
<td>221</td>
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<td>36 Month Partial Lump Sum Option Payment</td>
<td>523</td>
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<tr>
<td>Totals:</td>
<td>11,390</td>
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<td>11,070.17</td>
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</tbody>
</table>
The Summary of Disbursements on the preceding page provides data related to annuitants added to the payroll during the quarter. Specifically, for each category listed, the data includes: (1) the number of new payment inceptions, (2) the gross total of all new payments, and (3) the average of all payments. The categories are defined as follows:

Service Retirees: Members who have met the eligibility requirements and applied for a monthly service retirement annuity.

Disability Retirees: Members who have met the eligibility requirements, applied and been approved for a monthly disability retirement annuity.

Survivor Benefits: Monthly survivor benefits paid to eligible beneficiaries of deceased active members and retirees.

Survivor Benefit Lump Sum Payment: Single lump-sum survivor benefit, or reduced lump-sum in conjunction with monthly survivor benefit, paid to eligible beneficiaries of deceased active members and retirees.

Life Annuity as Death Settlement: Actuarially reduced monthly life annuity payment to eligible beneficiary of deceased active member. (One of several options which may be payable upon the death of an active member.)

60 Monthly Payments as Death Settlement: Monthly standard annuity payment, for a period of 60 months, to eligible beneficiary of deceased active member.

Refund of Deposit as Death Settlement: Payment of accumulated contributions and interest to beneficiary of deceased active member.

Twice Annual Salary as Death Settlement: Lump-sum payment equal to twice the member's annual salary rate, not to exceed $80,000, paid to beneficiary of deceased active member.

Lump Sum DROP Member Payment: One-time, lump-sum distribution, at retirement, of member's DROP account balance. (One of several DROP distribution options that may be elected by a retiree.)

5 Annual DROP Member Payments: Initial or subsequent annual DROP payment under this DROP distribution election.

10 Annual DROP Member Payments: Initial or subsequent annual DROP payment under this DROP distribution election.

60 Monthly DROP Member Payments: Initial or subsequent monthly DROP payment under this DROP distribution election.

120 Monthly DROP Member Payments: Initial or subsequent monthly DROP payment under this DROP distribution election.

DROP Payments to Beneficiary of Active Member: Lump-sum distribution of DROP account balance to beneficiary of deceased active member who participated in DROP prior to death.

12 Month Partial Lump Sum Option Payment: Lump-sum payment to retiree who elected a partial lump-sum option (PLSO) distribution equal to 12 months of standard annuity.

24 Month Partial Lump Sum Option Payment: Lump-sum payment to retiree who elected a partial lump-sum option (PLSO) distribution equal to 24 months of standard annuity.

36 Month Partial Lump Sum Option Payment: Lump-sum payment to retiree who elected a partial lump-sum option (PLSO) distribution equal to 36 months of standard annuity.
Developing a Funding Policy

Joseph Newton, FSA, EA, MAAA
Senior Consultant
Gabriel, Roeder, Smith & Company
February 22, 2017
Agenda

- What is a Funding Policy
- Why is a Funding Policy Important?
- Current Guidance on Funding Policy
- Funding Policy Goals and Components
- Questions
The “Funding Policy” of a pension plan is a systematic set of procedures used to determine the annual contributions to be made by the employer in a specific year and series of years.

Under a “typical” funding policy the total contribution requirement equals:
- Normal Cost (new accruals), plus
- Amortization of Unfunded Liability

Employer contribution equals total contribution requirement minus employee contributions.
In some scenarios, the contribution stream is fixed or less flexible, and the benefit provisions may be more contingent. Can be automatic through a formula or discretionary. A funding policy would provide guidance on when the contribution stream should be changed and how, when, and why the benefit provisions would be applicable.
Current Specifics for TRS

- Members contribute 7.70%, State contributes 6.80%, and Local Employers 1.50% on salaries for Non-OASDI members.
- Constitution provides for a 6% floor and 10% maximum employer contribution level.
- SB 1458 links the member and the employer rate so that if the employer rate decreases, so does the member rate.
- There is a statutory limitation on enhancing benefits if the funding period exceeds 30 years.
- Otherwise, the employer and member contribution amounts are set at the discretion of the legislature.
- The Board has no discretion or authority around the contributions into or the benefits paid out of TRS.
Why would the TRS Board consider approving a Funding Policy?

A written funding policy can:

- Help decision-makers come to a better understanding of the principles and practices that help sustain benefits over the long-term.
- Provide decision-makers a framework for understanding the tradeoffs related to reaching their goals.
Balancing between the goals requires tradeoffs:

- For example, between mitigating contribution volatility and recognizing gains and losses over a reasonable period.
- Therefore, Government Finance Officers Association recommends the development and use of a written funding policy to determine and document the reasoning behind the funding decisions.
Simplified Goals of a Funding Policy

- The funding policy should consider benefit security, intergenerational equity, and contribution stability and predictability – and the balance among these three – when selecting a contribution allocation procedure.

- Benefit security will be given preference over intergenerational equity and contribution stability, meaning policies that threaten benefit security will not be considered.
Intergenerational *inequity* -- willingly and purposefully making a generation pay for more than its fair share

 Typically, refers to a (or all) future generation(s), but can mean the current one, as well
Elements of a Funding Policy

- **Actuarial Cost Method**: which allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability or AAL)

- **Asset Smoothing Method**: which reduces the effect of short term market volatility while still tracking the overall movement of the market value of plan assets

- **Amortization Methods**: which determines the length of time and the structure of the increase or decrease in contributions required to systematically (1) fund any Unfunded Actuarial Accrued Liability or UAAL, or (2) recognize any Surplus, i.e., any assets in excess of the AAL
  - Level dollar vs Level Percentage of Payroll/Budget
  - For initial liabilities
  - For changes in assumptions
  - For changes in benefit provisions
  - For gains and losses (deviations from expectation) that naturally occur

- **Contribution stabilization techniques**: or “direct rate smoothing” in addition to both asset smoothing and UAAL/Surplus amortization

- **Procedures for Plans with lower funded ratios**

- **Surplus management**

- **Risk management**
Amortization Method

- A policy to determine the length of time and structure of contributions to fund the UAAL (or surplus)
  - Open or closed amortization
  - Level dollar or level percent of pay amortization
  - Length of the amortization period
  - Single amortization or separate amortization bases
  - Funding target (100% or less)
  - Special considerations such as early retirement incentives

- Conference of Consulting Actuaries Public Plans Committee “model practice” includes:
  - 100% funding target
  - Layered fixed period amortization by source of UAAL
  - Level percent of pay amortization
Understand the implications of amortization periods

- Long periods (e.g., 30 years) using level percent of payroll expect the unfunded to increase on a nominal basis for several years.
- On a real basis (factoring out inflation), the unfunded is expected to decrease.
- Policy may affect the new GASB discount rate!
Projected UAAL

UAAL peak in 2024 at $37.6 B

UAAL returns to current levels in 2031 at $37.6 B

UAAL peak in 2020 at $36.0 B

$ in Millions

Valuation Date

2016 2020 2024 2028 2032 2036 2040 2044

25 Year

30 Year
Projected Employer Contribution Rates

Difference of 0.50% of pay yields $203 M per year in FY18, $289M per year on average over 25 year period

Reach 100% Funding (UAAL fully amortized)

Difference of $5.2 B per year
Lack of Mandated Guidance

- Lack of any (ERISA equivalent) funding requirements for public plans allows for potential underfunding of pension liabilities
  - Public pension plans are currently under no Federal (IRS) requirement to annually contribute the amount needed to keep the unfunded from increasing. (In fact, public pension plans are not required to prefund their liabilities at all.)
  - Public pension plans are currently under no Federal (IRS) requirement to maintain a fully (100%) funded plan.
  - Public pension plans do not suffer any specific penalty for not maintaining a 100% funded plan.

- State laws on required pension funding vary

- Hank Kim of NCPERS stated “It is true that many public pension plans have suffered because of the Great Recession (as have all investors) and because many states and municipalities failed, even when the U.S. economy was booming, to make their required annual contributions to their pension plans.”
Recent Publications with Model Funding Policies

- Blue Ribbon Panel Report on Funding Principles
  - Published by Society of Actuaries
  - Recommend 15 year amortization periods

- Actuarial Funding Policies and Practices for Public Pension Plans
  - Published by the Conference of Consulting Actuaries (CCA) Public Plans Community
  - Fund to 100%, maximum 25 years if using closed layers, less otherwise. Focus on positive amortization.

- GFOA Best Practices
  - Fund to 100%. Fund an actuarially appropriate amount.
Other Considerations

What about when plans get over 100% funded?

- We can learn from past funding holidays
  - Employers got “out of the habit” of budgeting for pensions even when benefits continued to accrue
  - Members often got benefit increases that appeared to be “free”
  - Plans may have weathered the Great Recession better if contributions had continued and benefit increases had been funded with new contributions

- Being underfunded today may be the best time to set policy for being over 100% funded in the future
  - Establish a minimum contribution (e.g., the normal cost)
  - Establish contribution stabilization reserves
  - Fund benefit increases with new contributions over short periods
  - Set parameters for de-risking the plan
In Summary

- Now more than ever, it is important for public sector governing bodies to develop a fiscally sound, defensible and affordable pension funding policy and stick to it.
  - Jurisdictions must develop fiscally sound funding policies for their public pension systems and then have the discipline to follow them.
  - Pension funding policies have little impact if no one follows them. Officials must make the minimum required pension contributions when times are tough. Just as important, they must resist politically expedient pension giveaways when times are good.
Moving Forward
to Better Serve Our Members

Plan Management Policy, Rebecca Merrill, Division of Strategic Initiatives
System Measurements

- Compiles into a single policy the timing of system measurements, such as the experience study, actuarial audit, annual and mid-year valuations, etc.
- Provides for annual calculation of the actuarially sound contribution rate.
- Provides for deterministic and stochastic modeling of certain metrics.

Actuarial Methods

- Articulates the asset valuation and actuarial cost methods.

Funding Best Practices

- Articulates funding best practices for the plan sponsor’s consideration.
- Establishes the calculation of a “Plan Management Rate” (“PMR”) for inclusion in the annual actuarial valuation.
- The PMR is the contribution rate that does not decrease until the funding objective is met.
<table>
<thead>
<tr>
<th>Ongoing</th>
<th>Annually</th>
<th>Every 24 months</th>
<th>At Least Every 5 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Allocation Reviews</td>
<td>Annual Valuation</td>
<td>Mid-Year Valuation (Odd-numbered years)</td>
<td>Experience Study (Even-numbered year)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Investment Policy Statement Comprehensive Review (Even-numbered years)</td>
<td>Actuarial Audit (Even-numbered Year)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Strategic Asset Allocation Study (SAA)</td>
</tr>
</tbody>
</table>
In addition to the periodic measurements above, the Policy provides for the annual valuation and the mid-year valuation during legislative sessions.

Most recent experience study was completed September 2015 for the four-year period of FY 2010-2014.

Most recent actuarial audit was completed in September 2014.
The Board of Trustees has adopted the following actuarial methods for the purposes of actuarial valuations occurring on or after August 31, 2016 and for plan funding purposes:

- **Asset Valuation Method** – Five year smoothing with direct offset of gains/losses.
- **Actuarial Cost Method** – Ultimate entry age normal based on the current TRS active population as a whole.
# Funding Best Practices – Policy Considerations

<table>
<thead>
<tr>
<th>Category</th>
<th>Less Conservative</th>
<th>Proposed</th>
<th>More Conservative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding Objective</td>
<td>80% funded ratio</td>
<td>100% funded ratio</td>
<td>110% funded ratio</td>
</tr>
<tr>
<td>Amortization Objective</td>
<td>Not to exceed 31 years</td>
<td>Not to exceed 25 years</td>
<td>Not to exceed 20 years</td>
</tr>
<tr>
<td>Contribution Rate</td>
<td>Discretionary contribution rate</td>
<td>Discretionary contribution rate that does not decrease until funding objective is met</td>
<td>Required contribution rate that does not decrease until funding objective is met</td>
</tr>
<tr>
<td>Benefit Enhancement Policy</td>
<td>Allowable when funding period does not exceed 31 years</td>
<td>When less than 100% funded, are paid for at the time of adoption with new contributions over a period of less than 20 years</td>
<td>When less than 100% funded, are paid for at the time of adoption with new contributions over a period of less than 15 years</td>
</tr>
<tr>
<td>Utilization of Funding Excess</td>
<td>Discretionary</td>
<td>Once 100% funded, potential contribution reductions and benefit enhancements are balanced with creating a margin for adverse plan experience</td>
<td>Once 110% funded, potential contribution reductions and benefit enhancements are balanced with creating a margin for adverse plan experience</td>
</tr>
<tr>
<td>Best Estimate of Investment Returns</td>
<td>Best estimate is materially less than investment return assumption</td>
<td>Best estimate is approximately equal to investment return assumption</td>
<td>Best estimate is materially greater than investment return assumption</td>
</tr>
</tbody>
</table>
Next Steps

- Receive Board Direction
- Refine Policy Draft
- Policy Committee Meeting
- Board Adoption
TAB 9
Moving Forward

to Better Serve Our Members

2017 Communications Plan: Howard Goldman and Rhonda Price, Communications
2017 Communications Plan

**Why a Communications Plan?**

- Identify where we want to go and how we will get there.
- Clarify relationships between audiences, messages, channels, activities, and materials.
- Develop and implement specific communication initiatives.
- Encourage team collaboration and creativity.
- Actively engage stakeholders.
- Convey a shared stake in the success of our communication initiatives.
- Measure success and identify areas for continuous improvement.
Plan aligns with 2017-21 Strategic Plan.

- Incorporates agency communication goals, core competencies, TRS' mission, and Communications Department mission:
  
  “We are committed to working with other TRS departments to provide timely, accurate, and meaningful information about TRS to all internal and external stakeholders.”

- Proactively addresses challenging issues rather than reacting to them.

- Reflects technological advances we're using to reach members in new ways.
2017 Communications Plan

Before We Began

- Met with EC members to seek input.

- Used feedback from 2016 Member Satisfaction Survey.
  - Learned TRS News and Benefit Handbook could be improved.
  - Learned members less satisfied with TRS website than in previous years.

- Website Redesign Project was under way. We’ll discuss successful launch and use later.

- Prepared first draft of plan.

- Met with EC again, got more input, drafted final plan for board and agency.
Identified Agency Priorities

- Pension Investments
- Pension Plan—Benefit Services, Strategic Initiatives
- Health Care Programs
- Human Resources
- Communications
- Measuring Success
2017 Communications Plan

Identified Stakeholders

- Active members
- Retirement recipients
- Reporting entities
- Elected officials, trustees, executives
- Education associations
- Current and prospective TRS employees
- Vendors
- News media
- Social media participants
- General public
2017 Communications Plan

Pension Investments

- **Goal:** Sustain financially sound fund, increase awareness of TRS as global investments leader, & maintain member trust in transparent, easy-to-understand operations.

- **Strategy:** Maintain and increase TRS profile as highly successful, innovative, ethical, and respected pension fund.

- **Tactics:**
  - Publicize IMD and its employees when they have won prestigious awards.
  - Hire new communications specialist to increase understanding of investments, build relationships with media.
  - Produce series of brief informational videos.
  - Collaborate with IMD on events such as the highly successful Emerging Manager Conference.
2017 Communications Plan

Registration NOW OPEN!

2017 Emerging Manager Conference
January 19, 2017 ★ Austin, Texas

[Images of people at the conference]
2017 Communications Plan

**Pension Plan - Financial Awareness**

- **Goal:** Increase awareness among younger members of the need for financial planning.
- **Strategy:** Partner with Special Projects to promote the 403(b) program and 2016-17 “Financial Awareness Video Series.”

**Tactics:**
- Promoted videos through website, social media, *TRS News*, email notices, & posters.
- Asked associations to email notice of videos to members.
- Increased visibility and understanding of 403(b); promoted 403(b) Rules Review Conference.
2017 Communications Plan

Pension Plan - Benefit Services

- **Goal:** Partner with Benefit Services to help members understand the value of TRS pension benefits.

- **Strategy:** Develop communication messages and materials targeted at new members.

- **Tactics:**
  - Produce a “Welcome to TRS” video for new members.
  - Produce targeted newsletters for active members and retirees.
  - Increase use of Twitter for tech-savvy members.
  - Partner with active member associations to share content on social media.
Goal: Partner with Benefit Services to increase understanding of misunderstood topics such as Employment After Retirement (EAR) among mid-career actives and those nearing retirement.

Strategy: In addition to EAR booklet, provide timely messages and information on topics such as the change in the definition of substitute.

Tactics:
- Produce new materials, such as brochures.
- “Top 10 Facts & Misconceptions about EAR.”
- Produce an instructional video.
- Increase use of social media for more frequent EAR information.
2017 Communications Plan

Pension Plan - Benefit Counseling

- Goal: Increase awareness of the many ways besides calling the hotline in which members can get questions answered.

- Strategy: Implement new methods for members to get information and improve current materials.

- Tactics:
  - Promote remote counseling.
  - Promote social media as Q&A resource.
  - Promote website email address/ MyTRS.
2017 Communications Plan

**TRS-Care**

- **Goal:** Partner with HIB to create communication channels to increase health care literacy, foster consumer awareness and promote wellness.

- **Tactics:**
  - Prepare wide range of materials *in advance* of possible legislative health plan changes.
  - Re-introduce *The Pulse*—a direct-to-participant email newsletter.
  - Use website for stories on participants like Derly Rivera & how TRS health plans benefit them.
  - Develop social media calendar for posts on topics like senior health & fitness, osteoporosis and mental health awareness.
  - Develop videos that explain often confusing health plan information simply.
2017 Communications Plan

TRS-Care Videos

“Medicare 101”

“TRS Today” Interview with Chief Health Care Officer Katrina Daniel
Goal: Foster a health care participant population that knows how to use benefits wisely and effectively.

Strategy: Anticipate participant needs and plan more proactive and direct-to-member communications.

Tactics:

- Develop materials well in advance to communicate possible legislative changes.

- Develop clearly written content for a broad array of tools including newsletters, direct mail, frequent social media posts, fresh website content, and email campaigns.

- Promote Alex, the new online health counselor to answer questions & guide members through enrollment, etc.
2017 Communications Plan

Human Resources

- Goal: Partner with HR to help achieve goal of promoting TRS as a career destination.

- Strategy: Provide communication services and skills to assist HR with recruitment and retention.

- Tactics:
  - Develop recruitment content for website.
  - Produce new printed materials for recruitment.
  - Produce or obtain more videos.
  - Assist in cross-promoting content for Facebook, Twitter and especially, LinkedIn.
2017 Communications Plan

LinkedIn Career Page

Recent Updates

**Teacher Retirement System of Texas** Each summer TRS hires interns in a variety of programs to work on projects throughout our agency. It's a great opportunity for students beginning their professional careers. If you have any questions, contact our office or speak to a first-year advisor...

**Advice to Your Younger Self?**

LinkedIn.com - Milestones are a large part of our business. We track them for our members from starting new jobs, career moves, marriages and children, and up to and... [Read More]

21 days ago

**Teacher Retirement System of Texas** This past year, TRS began developing a series of financial awareness videos designed to educate our members about retirement self-sufficiency. Our Division of Strategic Initiatives was behind the production of these animated whiteboard videos, and... [Read More]

26 days ago

Jobs at Teacher Retirement System of Texas

- Accountant
  - Austin, Texas Area
- Java Developer
  - Austin, Texas Area
- Senior Benefits Attorney
  - Austin, Texas
- Assistant General Counsel (Investment Attorney)
  - Austin, Texas

See more jobs at Teacher Retirement System of Texas →

Advice to Your Younger Self?

Published on January 11, 2017

Christine Bailey, SPHR, CCP
Manager, Talent Acquisition and Compensation

Milestones are a large part of our business. We track them for our members from starting new jobs, career moves, marriages and children, and up to and after retirement.

- **Job Postings**
- **Job Notification Sign-Up**
- **Videos**
- **Agency news like winning “Top Ten Workplace in Austin”**
- **Articles by HR staff contributors**
2017 Communications Plan

Communications Department

- Goal: Provide excellent communication materials and customer service.
- Strategy: Collaborate with customers on projects to achieve an agreed-upon vision.
- Tactics:
  - Develop process to ensure close departmental collaboration for communications, including prioritizing tactics.
  - Use technological advances to communicate more quickly, effectively and accurately.
  - Increase use of social media, especially Twitter, to tech-savvy members.
  - Lead website governance committee in producing guidelines to maintain and enhance website.
  - Ensure website meets or exceeds stakeholder needs.
2017 Communications Plan

Website Survey: Sept. 27 – Dec. 6, 2016

Q3: How would you rate the appearance of our new website?

Answered: 268  Skipped: 6

- Excellent
- Very Good
- Good
- Average
- Poor
- Didn’t Notice

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Q:4 How would you rate the Navigation (Menus, Dropdowns, Search) of our new website?

- Excellent
- Very Good
- Good
- Average
- Poor
- Didn't Notice

Answered: 270  
Skipped: 4
2017 Communications Plan

Website Enhancements: News Aggregator

Health Care News

2/3/2017  Using Your Health Care Benefits Wisely
Knowing how to use your TRS health benefits can help you get or stay healthy and save you money. Here are some basic tips to help you use your health care benefits wisely.

2/2/2017  ALEX: Your Personal, Online Health Benefits Counselor
ALEX is an interactive, online tool – with personality – designed to help you better understand and use your TRS health plan.

1/31/2017  TRS Mailed 1095-B Tax Forms in Late January
Form 1095-B verifies you had medical coverage for all or part of last year. When you file your taxes, you’ll need to report to the federal government that you and your eligible dependents had medical coverage for all or part of calendar year 2016.
2017 Communications Plan

Measuring Success

- Goal: Set goals that are SMART: Specific, Measureable, Attainable, Realistic, and Timely.
- Strategy: At the beginning of each project, work with our customers to determine how we will measure success.
- Tactics:
  - Conduct first off-year member satisfaction survey.
  - Increase use of surveys on website and elsewhere.
  - Conduct focus groups with targeted stakeholders.
  - Ask benefit counselors about FAQs from members; prepare clarifying information.
  - Use social media software to more strategically track likes & engagement.
2017 Communications Plan


Total Fans, 2016 8,527
Total Fans, 2017 10,016
Increase + 17.4%
2017 Communications Plan

Social Media Trends

- **Facebook:**
  - Will try to compete with Twitter as go-to place for news and trending stories.
  - Will focus more on video, including live streaming.

- **Twitter:**
  - Now a news product, not just a social network. Fastest place to get and share news.
  - Through Periscope, Twitter is focusing on trending videos and live streams.
  - New customer-support features now available.
  - After launching Moments, Twitter now allows users to stitch together multiple tweets into slideshow-like stories.
  - Has added mute feature to avoid harassment. Looking to add a new reporting option for hateful content.

- **LinkedIn:**
  - LinkedIn was acquired by Microsoft in 2016; it is expected the company will explore opportunities to further monetize its ownership.
Questions?
Teacher Retirement System of Texas
2017 Communications Plan

January 30, 2017
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VII. Conclusion......................................................................................15

Exhibit A – TRS Communications Plan Survey.........................................16

Exhibit B – Calendar of Observances.....................................................18
I. Introduction

The Teacher Retirement System of Texas (TRS) continuously seeks to improve the quality of work and customer service for our members. TRS recognizes that we cannot achieve this overarching goal without effective and transparent communication with stakeholders.

The agency’s 2017-21 Strategic Plan calls for several communications goals – among them a comprehensive communications plan (hereafter referred to as the “plan”) to be developed and then updated on a yearly basis. This document is the first such plan and outlines the goals, strategies and tactics for implementation.

In addition, along with benefit delivery, investment management and workforce management, TRS includes communication with stakeholders as a “core competency,” critical to the success of TRS’ mission which is – “Improving the retirement security of Texas educators by prudently investing and managing trust assets and delivering benefits that make a positive difference in members’ lives.”

Likewise, the mission of the TRS Communications Department (hereafter referred to as “Communications” and “we”) is aligned with both the strategic plan and the agency’s core competencies – “We are committed to working closely with other TRS departments to provide timely, accurate and meaningful information about TRS to all internal and external stakeholders.”

Communicating with TRS’ more than 1.5 million active members and retirees along with other stakeholders has always been a challenging task; however, in recent years, the need for effective communication has become even more critical. Active members’ and retirees’ concerns include, but are not limited to, the solvency and sustainability of the pension fund and TRS’ health care plans and personal financial security.

Accordingly, the 2017-21 Strategic Plan calls for Communications to provide mission-centric and broader information to stakeholders. We must leverage technological advances to develop accurate, timely and consistent information to help participants make better financial and health care decisions. To ensure we meet these directives, Communications will work in collaboration with other departments in ways outlined in this document.

We will continue to provide information through annual briefings, board meetings and town hall webcasts, as needed, to discuss legislative and actuarial changes as well as investment performance. We will respond to stakeholders more quickly through increased social media engagement on Facebook, Twitter, YouTube and LinkedIn, and we will use email more effectively.
We recognize the shift in ways people prefer to get their information. Mobile devices are now selling faster than many PCs and our members are seeking their news and information “on the go.”

With that mobility in mind, and in accordance with the 2017-21 Strategic Plan, Communications and a cross-departmental project team launched a redesigned website in fall 2016. The new website features a mobile-friendly, responsive design; a vastly improved search mechanism; a more visually appealing, intuitive and cleaner layout; and easy-to-understand content.

In addition, the team designed the new website to meet state and federal accessibility guidelines. Not only will the website be accessible, but also for the first time in the agency’s history, Communications will roll out an employee website accessibility awareness and training program this year, in response to our members’ needs and legal requirements. We will discuss use of the website as a tactic throughout the plan as the website remains one of the primary ways that TRS communicates with all stakeholders.

As stated, we will discuss in detail newer ways of engaging stakeholders along with TRS’ more traditional ways. However, we will next address a crucial aspect of communications – listening. It is not just about providing information we think stakeholders want to receive; we are committed to listening to stakeholders’ feedback before assuming we know their needs. The cycle below illustrates effective communication.
We first target stakeholders, compose key messages and information, and transmit the information through appropriate channels. We must then offer channels for feedback such as customer service contacts, social media, surveys, focus groups, and polls. We then analyze that feedback for frequently asked questions, for example, indicating a lack of message clarity or misunderstanding. Perhaps the information is too technical. If so, we must work quickly to address the identified issues with clear information. If the methods of communicating are not working, we will try different channels until stakeholders understand the information we are trying to convey.

II. Survey of Executive Council

Keeping the communications cycle in mind, we sought input from key internal stakeholders before writing this plan. We created a survey (Exhibit A, page 16) and then met with members of TRS’ Executive Council (EC). We asked them questions such as whether our department should discontinue, change in a significant way and/or increase communication channels such as publications, videos, social media, MyTRS emails, brochures, board meeting webcasts, and town hall meetings. We also wanted to explore ideas they might have to communicate with their specific stakeholders. Finally, we wanted to know how we could improve our service to them. We met again with EC members in early 2017. This plan contains much of the feedback received from both sets of meetings.

III. 2016 Member Satisfaction Survey

Before writing this plan, we also referred to the 2016 TRS Member Satisfaction Survey that is conducted every two years. TRS solicits comprehensive feedback from retirees and active members on a wide range of services and outreach efforts, including communications.

The 2016 survey indicated opportunities for improvement for two key TRS publications: the TRS Benefits Handbook and the TRS News. The survey showed that both active members and retirees were less aware of the Benefits Handbook than in the previous survey. The active members’ score for the Benefits Handbook also decreased in the categories of clarity and ease-of-use.

For the TRS News, active members and retirees found the information less useful than in the previous survey. Finally, satisfaction with the TRS website scored lower among active members than in previous years. Initial feedback indicates that our recent redesign will bring substantial improvement in scores in the 2018 survey. We will discuss our plans to increase awareness of and satisfaction with both the Benefits Handbook and TRS News in this plan.
IV. Stakeholders

Now that we have gathered input from our internal and external stakeholders, we are nearing a discussion of the communication goals, strategies and tactics we will use; however, with a fund the size of TRS, we need to identify, communicate with and receive feedback from many more stakeholders, including subsets of certain groups. In most cases, we will not be working alone but rather in partnership with other departments.

Please note: direct communication with some stakeholders is primarily the responsibility of certain TRS personnel and divisions such as Trustees, Executives, Benefit Services, Health and Insurance Benefits (HIB), and Governmental Relations with assistance, whenever needed, from Communications. Likewise, Communications has primary responsibility for communicating with the news media and stakeholders using social media, with assistance from designated agency personnel. We have listed stakeholders below, noting primary communicators with an asterisk. Unless otherwise indicated, Communications serves in a partnership/customer service role across all divisions.

Active members – including new members, mid-career members and members nearing retirement – Benefit Services*, HIB
Retirement Recipients (including service, disability and survivor) – Benefit Services*, HIB
TRS-ActiveCare Participants – HIB*
TRS-Care Participants – HIB*
Reporting Entities (REs) – Benefit Reporting*
Elected Officials – Trustees*, Executives*, Governmental Relations*
Education Associations – Governmental Relations*
TRS Employees – HR*, Executives
Prospective Employees – Human Resources (HR)*
Vendors – Procurement*
News Media – Communications*, Executives
TRS Social Media Participants – Communications*, departmental support
General Public – Communications*
V. Goals, Strategies and Tactics

As mentioned, this plan is one of many organizational needs identified in the agency’s 2017-21 Strategic Plan. We have created the following goals, strategies and tactics based on the plan and other communication requests for current and new TRS programs and services. They are of utmost importance to our members, TRS executives and others charged with ensuring the Fund’s success both now and for many years to come.

i. Pension Investments

**Goal:** Sustain a financially sound pension trust fund and increase awareness of TRS as a global investments leader while maintaining members’ trust in transparent and easy-to-understand operations that keep their retirement funds secure.

**Strategy:** Partner with the Investments Management Division (IMD) to maintain and increase TRS’ international, national and state profiles as a highly successful, innovative, ethical, and respected pension fund.

**Tactics:**
A. Proactively launch a pilot project featuring a messaging campaign on hedge fund and private equity fees to increase understanding of how IMD manages investments in the best interest of members. This campaign could include the use of FAQs, other website content, social media, newsletters, and presentations.
B. Hire an Investments Communications Specialist to increase awareness and understanding of TRS’ investments (including return assumptions), build relationships with reporters, issue more news releases to promote TRS and pension fund accomplishments, and handle media calls in an efficient manner.
C. Explore software options to better track and categorize inquiries.
D. Explore how to leverage IMD internal speeches and training to a wider audience at TRS or among our membership.
E. Publicize IMD and its employees when they have won prestigious awards.
F. Produce a series of brief videos. Topics may include “10 Reasons to Feel Secure about Your TRS Pension,” “How TRS Increases the Fund’s Value through Investing,” “Investments Overview,” and “How TRS has become a Champion of Providing Investment Partnership Opportunities for Women and Minorities.”
G. Collaborate with IMD to provide photography, signage and other materials for events such as the Emerging Managers Conference.
ii. **Pension Plan**

**Goal 1:** Increase awareness among younger members of the need for financial planning.

**Strategy:** Partner with Special Projects (SP) to promote the Financial Awareness Video Series (FAVS) and the 403(b) program to increase members’ understanding of the importance of financial planning.

**Tactics:**

A. Reserve a “feature story” spot for the 2016-17 video series on the home page of the website (changing videos weekly), create a page devoted to current and future videos and provide a link to the series page from the TRS.TV page.
B. Place the videos on YouTube and promote through other social media.
C. Send MyTRS email notices of new videos.
D. Promote FAVS in the *TRS News* and *Update* newsletters.
E. Increase public awareness of the videos by using news releases and other media outreach to disseminate information.
F. Send emails specifically to REs informing them of FAVS and asking them to help promote FAVS.
G. Work with SP and IT to create a webpage to host downloadable posters that REs and others can use to promote the series.
H. Work with SP to have district personnel mention the video series when giving presentations to educators.
I. Work with associations to promote the series through emails to members.
J. Increase visibility and understanding of 403(b) (including related fees) through articles in publications, feature stories on the website, upgraded content on the website, and posts on social media.
K. Collaborate with SP to promote special events such as the 403(b) Rules Review Conference.

**Goal 2:** Partner with Benefit Services to help members understand the value of TRS pension benefits and how best to avoid losing their annuities.

**Strategy:** Develop communication messages and materials targeted at new members on the value of TRS benefits.

**Tactics:**

A. Produce a “Welcome to TRS” video for new employees.
B. Produce targeted newsletters for active members and retirees.
C. Produce TRS benefits articles in *TRS News* and *Update*.
D. Use MyTRS email to announce articles of interest to tech-savvy members.
E. Increase use of Twitter for tech-savvy members.
F. Consider using text messages for tech-savvy members.
G. Collaborate with education associations by sharing their posts on Facebook and asking them to share ours.
H. Partner with active education associations by providing content they can use in their own newsletters.
I. Work with Education Service Centers (ESCs) to promote new TRS member information and educational campaigns (such as the FAVS).

**Goal 3:** Partner with Benefit Services to increase understanding of often-misunderstood topics such as Employment After Retirement (EAR) among mid-career actives, those nearing retirement and Reporting Entities.

**Strategy:** In addition to the traditional EAR booklet, provide accurate, timely and consistent new messaging and materials, including education about the change in the definition of substitute.

**Tactics:**
A. Create new brochure on Top 10 Facts and Top 10 Misconceptions about EAR.
B. Use new brochure when meeting with associations and others.
C. Use calendars for social media posts, photos and videos to direct people to new EAR information on our website.
D. Use MyTRS email notices to announce EAR news in specific publications.
E. Create new instructional videos on EAR for use by members that can also be used by benefit counselors.

**Goal 4:** Continuously improve our benefit delivery information by collaborating with Benefit Services to increase awareness of the many ways, besides calling in, which TRS members can receive help with questions about pension benefits.

**Strategy:** Implement new methods for members to access counseling and benefit information and promote current methods.

**Tactics:**
A. Redesign the current layout and improve the writing style of the *TRS Benefits Handbook* to make it easier to understand and use.
B. Increase awareness of the *TRS Benefits Handbook* with a new promotional campaign. The campaign will include, but is not limited to, inserts in annual statements; information for the website, *TRS News*, the *Update* newsletter (to reporting officials), social media, and with *MyTRS* emails; and asking ESCs and ISD communications directors to distribute posters promoting the handbook in their facilities and on their websites and social media channels.
C. Improve the content in the *TRS News* to make it more useful to both active members and retirees.
D. Implement new email address for members’ account-specific questions under “Contact Us” on the TRS website.
E. Review and update brochures at least every six months, or as needed.
F. Produce new, brief videos. Potential topics could include ERS/TRS transfer, proportional retirement, the optional retirement plan (or a joint-webinar between TRS and/Higher Education Coordinating Board), special service credit, new web self-service features, retiree planning in yearly stages, and TRS’ and the Legislature’s role when it comes to benefit increases and other issues.
G. Produce new FAQs and other materials on TRS refunds to help members understand the impact on future financial security.
H. Leverage technological advances such as providing remote counseling sessions and promote such sessions on website and elsewhere.
I. Use calendars for social media posts, photos and videos, the website and other channels to promote new materials and current member counseling opportunities.
J. Work with Benefit Services to conduct research on TRS’ interactive voice response (IVR) system to determine what members like/dislike.

### iii. TRS-Care

**Goal:** Cultivate a well-informed, engaged and healthier population by using communications to increase health care literacy, foster consumer awareness and promote wellness. Informed and engaged participants can better manage health care costs, understand their plan provisions and key coverage and make the most of their health benefits.

**Strategy:** Assist HIB in leveraging and enhancing existing communications tools and resources to deliver timely, accurate, consistent and targeted messages. Tell the story about the value of TRS-Care benefits. Educate participants on the changing landscape of health care in the U.S. to provide broader context for benefit adjustments. Promote better understanding of health care by providing participants with evidence-based information on the link between preventive care, longevity and well-being. Help participants understand how to get the right care at the right time. Anticipate participant needs and questions and plan proactive and direct-to-member communications. Educate participants on plan provisions and key coverage. Identify participants who need the most assistance.

**Tactics:**
Collaborate with HIB to:

A. Develop and distribute messages and materials to communicate effectively and plan changes that may result from the 2017 85th Texas Legislature to ensure participants are well prepared to use their benefits.
B. Coordinate information with HIB and Benefit Counselors to ensure consistency in responding to the public.
C. Clearly place appropriate logos and contact information in all communication vehicles.
D. Develop key messages for the plan participant audience, as well as the legislator and taxpayer audiences and tie them to a variety of communications channels.
E. Engage communications experts to assist with health care education campaign.
F. Implement and publish *The Pulse*, a new, direct-to-participant email newsletter on health care.
G. Produce articles for *TRS News* and *The Pulse* – a new source for health care consumer tips, wellness and benefit updates.
H. Develop online educational materials such as participant-oriented feature articles, health care tips, website content, video scripts, FAQs, and calendars for social media posts.
I. Attend TRTA fall regional conventions to provide information about health program changes.
J. Keep participants informed of what materials they should expect from vendors in the mail, including new informational kits, ID cards, etc.
K. Supplement primary vendor communications by promoting statewide seminars on TRS-Care Medicare Advantage and Express Scripts Medicare prescription drug plan through website content, news articles and social media.
L. Leverage vendor resources to target communications to stakeholders.
M. Develop webinars to communicate health care changes, wellness topics and tips on how to use your plan wisely.
N. Use frequent social media postings relevant to the TRS-Care population:
   a. Cataract Awareness
   b. Senior Health and Fitness
   c. Mental Health Awareness
   d. Healthy Travel
   e. Osteoporosis Awareness

### iv. TRS-ActiveCare

**Goal:** Foster a health care participant population that knows how to use benefits wisely and effectively and carries this knowledge into their retirement years under TRS-Care. Informed and engaged participants can better manage health care costs, understand their plan provisions and make the most of their health benefits. TRS has a greater opportunity to help TRS-ActiveCare participants build better health care consumer and wellness habits earlier in life. Participants who lead healthy lives early on would give TRS a higher return on investment by using less high-cost services later in life.

**Strategy:** Anticipate participant needs and questions and plan more proactive and direct-to-member communications. Provide facts on the evolving environment of health care to provide broad context for possible changes in the health care plan. Send targeted and well-timed communications. Educate participants on shopping for cost-effective and valuable health care service alternatives. Promote better understanding of health care by providing participants with evidence-based information on the link between preventive care, longevity and well-being.
Tactics:
Collaborate with HIB to:

A. Develop and distribute messages and materials to communicate and effectively plan changes that may result from the 2017 85th Texas Legislature to ensure participants are well prepared to use their benefits.
B. Provide detailed information to school administrators and participants on new plan rates and benefits structure as soon as the final benefit design is known.
C. Implement *The Pulse* email newsletter and produce TRS-ActiveCare news for *The Pulse*.
D. Produce articles for every edition of *TRS News* to communicate plan changes.
E. Engage experts to help shape communication plan strategy.
F. Develop content for targeted mailings and emails explaining possible benefit changes.
G. Develop online materials such as participant-oriented feature articles and other website content, “TRS-ActiveCare” video, FAQs and calendars for social media posts and photos.
H. Keep participants informed of what new plan materials they should expect from vendors in the mail (including information kits and ID cards), through website content, social media reminders, news articles, and presentations.
I. Clearly place plan logos and contact information in all communication vehicles.
J. Obtain feedback on health care communication preferences and satisfaction through surveys and focus groups.
K. Promote use of “ALEX” – an online, animated benefits counselor that walks participants through plan options and helps them decide on the right plan for them. If a high-deductible health plan becomes the only option for participants, ALEX may serve as a tool to help participants explain how their plan works and when they would pay out-of-pocket or health care services.
L. Use frequent social media postings to promote wellness information such as:
   a. Planning to Start a Family and Having Your Baby Soon
   b. Responsible Drinking
   c. Skincare During Summer
   d. Healthy Eating
   e. Wellness Challenge
M. Develop webinars to communicate health care changes, wellness topics and tips on how to use your plan wisely.
N. Develop communications and trainings for school administrators to engage them and ensure they have the knowledge and tools to be successful.
O. Identify common questions and concerns and use those to help shape content and tone of messages.
v. Human Resources

**Goal:** Partner with HR to help them achieve their goal of promoting TRS as a career destination that provides a total compensation package that enables us to attract, retain and develop a highly competent staff.

**Strategy:** Provide communication services and skills to assist HR with implementing their recruitment and retention initiatives.

**Tactics:**

A. Curate and develop content including articles and photography for HR to use on social media sites (e.g. LinkedIn Career pages), in recruitment materials (printed and online), and on the website. Examples include:
   a. informational articles focusing on various TRS departments
   b. descriptions of extra “perks” of working at TRS such as downtown location, flexible work schedules and other components of the total rewards package
   c. posting more updates to the LinkedIn page to engage with followers
   d. posting more content about the culture of TRS and its work/life balance

B. Assist in cross-posting articles to use on LinkedIn, Facebook, Twitter, or in other communication materials. These articles would:
   a. help people understand TRS and what the agency does
   b. recognize TRS employees who have earned the Shining Example Award and the Executive Director’s Award of Excellence during National Public Employee Appreciation Week
   c. direct people to the website to publicize outstanding employees
   d. direct people to the website for employees’ “testimonials”
   e. publicize TRS employees who “give back” to the community

C. Produce or obtain more videos on:
   a. employees at work and topics such as “Why I Consider TRS my Second Home”
   b. TRS as a Top Workplace in Austin for several years in a row
   c. department-specific recruitment materials to attract new employees
   d. TRS culture and core values

D. Produce new materials for recruitment:
   a. brochures, materials for new-hire packets and other recruitment collateral (career fair giveaways, table tents, logos, etc.)
   b. maintain an updated photography portfolio that includes division-specific photography, informal and formal photos, and documentation from events, celebrations and other activities

E. Provide photography and articles in *Chalkboard* newsletter for events like:
   a. lunch and learns
   b. SECC kickoff and events
   c. employee tailgate
d. employee appreciation day (service award recipients and video for 25+ service anniversary recipients)
e. agency holiday celebration
f. leadership development program
g. huddles
h. pictorial documentation of TEAM events, including celebrations
i. OCM/core values/featured employee events
j. IMD events
k. other events as appropriate

vi. Communications Department

Goal: Our customers will be confident in our responsiveness. We will manage all projects effectively. Our customers will perceive us as a valued resource within the agency. We will practice effective communications, and internal and external customers will take note of our solutions for their quality and innovation.

Strategy: Work closely with our customers to ensure we have an agreed-upon vision of the final creative piece, complete information for us to create text or other content, and agreed-upon, realistic deadlines. The deadlines should have enough time built in for frequent communication check-ins, (ideally in person and perhaps once a week depending on the project schedule), dates for drafts 1, 2 and final approval, for example, and “padding” to allow for unforeseen issues.

Tactics:
A. Develop a process to ensure close departmental collaboration for all agency communications needs outlined in this plan.
B. Use a broad variety of methods to communicate the upcoming transition to the new TRUST website member self-service portal, including the news that all those who have previously created accounts on MyTRS will have to create new usernames and passwords for the new portal.
C. Continue to improve upon the functionality of the website with new, creative tools and other enhancements now available after phase two of the website redesign.
D. Work with content creators to ensure the website has well-written, consistent and timely content as specified in the Website Governance Document.
E. Continue working on the Website Governance Document to address new issues that may arise as we continually improve the TRS website.
F. Meet with Benefit Services to prioritize and update all brochures, as needed.
G. Conduct town hall meetings, if deemed appropriate by the EC, to discuss legislative or other issues.
H. Produce legislative wrap video(s) once the session has ended.
I. Work with departments wanting videos to prioritize them and then decide what we can do inside or what may need outsourcing.
J. Communicate to all TRS employees that we have an updated Website/Writing Style Guide and TRS Branding Style Guide that employees can follow when creating documents, PPTs, etc.

K. Produce content calendar for social media posts, photos and videos to promote yearly events such as National Retirement Security Week (Exhibit B, page 18).

L. Use social media to post departmental calendar content such as announcements, jobs, and links to other content.

M. Develop an agencywide program to educate employees on how to provide accessible information to persons with disabilities.

N. Assist in the translation of certain publications and forms for Spanish-speaking members.

VI. Measuring Success

Throughout this plan, we have discussed various brochures, newsletters, videos, the website, social media and a host of other communication tools we will use over the next year and beyond. We have discussed ways to improve publications such as the TRS News and the TRS Benefits Handbook. However, our work will be most effective if we know whether we have actually succeeded in increasing understanding. Therefore, as we have carefully set goals, strategies and tactics for this plan, we will establish ways to measure our success.

Goal: Set goals that are:

S – Specific

M – Measurable

A – Attainable

R – Realistic

T – Timely

Strategy: At the beginning of each project, we will discuss with customers how we will all measure the success of the project “smartly.”

Tactics:

A. Use surveys “before and after” or “X-date to X-date” for:
   a. brochures and publications
   b. website
   c. social media
   d. presentations

B. Use Meltwater Buzz Engage Social Media Analytics Software measuring:
   a. Facebook growth in likes and engagement
   b. Twitter growth in followers, likes and engagement
c. LinkedIn growth in followers and engagement
   d. YouTube growth in views and subscribers
C. Use Google Analytics to determine what website pages are most popular and what search terms visitors use most frequently, for example, to make information more accessible.
D. Use “calls to action” to measure participants’ engagement in desired behavior.
E. Check MS Word reading level measurements.
F. Monitor questions received from benefits counselors and produce materials to clear any confusion.
G. Monitor questions and/or comments received via the website.
H. Monitor feedback and posts on Facebook and other social media platforms.
I. Check number of new job applicants after specific social media campaigns, such as a Facebook ad.
J. Continue having members fill out surveys after counseling visits.
K. Continue having internal customers fill out satisfaction surveys when jobs are completed.

VII. Conclusion

In closing, the most important thing to consider about this communication plan is that it will never be “completed,” per say. It is a “living document” to be referenced throughout the year, perhaps to set new goals or adjust some of the tactics being used when they are proving to be ineffective. Going back to the communications cycle, we must constantly listen to our customers, both external and internal, to ensure we are providing the best in everything we do. If we discover something needs improvement, we will consider that as an urgent “call to action.”

All of us at TRS serve people who have dedicated their lives to the education of Texas students. They deserve nothing but the best possible work we can perform.
Communications has begun developing a new communications plan for the agency—one of the projects outlined in the TRS Strategic Plan. As part of this process, we are seeking input from all areas of the agency. Listed below are a series of questions that we’d like to ask you to help us in this process. We will send you a meeting invitation so that we can discuss your answers to these questions and learn of any other suggestions you may have. Our goal is to make this plan as responsive to your needs as possible.

Communications currently manages a number of outreach efforts. Some of our primary channels include the TRS News (members and retirees), TRS Update (for employers), Chalkboard (for employees), the agency website, social media (Facebook, Twitter, YouTube, LinkedIn), videos, MyTRS emails, brochures, board meeting webcasts, webinars, and town hall meetings.

Thanks for your help in answering the following questions:

1. Which of the above should be continued?

2. Which of the above should be discontinued and why? What, if anything, would you replace these with?

3. Which of the above should be continued, but changed in some way? What changes would you like to see?

4. What new communication channels would you like to see us use? Please explain.

5. What, if any, outreach efforts have you seen undertaken by other pension funds/other organizations that you liked and feel that TRS should consider?

6. What, if any, types of research could we assist you with that could be helpful to you (focus groups, telephone surveys, email surveys, online surveys, etc.)?

7. How well do you think we do in managing press relations? What, if anything, do you feel we should undertake to better represent the agency in press stories?

8. What, if any, activities are planned by your area in the coming year that may benefit from a press release?
9. If you feel that we can assist you with any videos in the coming year, what would be the topics of those videos, who would be your target audience(s), and what do you anticipate the timeframe would be?

10. Do you have any other suggestions for items to include in our new communications plan?

Thanks in advance for your help with these questions.
Exhibit B
Calendar of Observances

January:
National Month:
National Mentoring Month
National Days:
Jan. 1 – New Year’s Day
Jan. 11 – Most State Legislation Sessions Begin
Jan. 16 – Martin Luther King Jr. Day
Jan. 20 – Inauguration
Jan. 24 – National Compliment Day

February:
National Month:
National Black History Month
National Week:
Feb. 12-18 – Random Acts of Kindness Week
National Days:
Feb. 7 – Send a Card to a Friend Day
Feb. 12 – Abraham Lincoln’s Birthday
Feb. 14 – Valentine’s Day
Feb. 20 – Presidents’ Day

March:
National Month:
National Women’s History Month
National Days:
March 2 – National Read Across America Day (Dr. Seuss Day)
March 3 – National Employee Appreciation Day
March 7 – National Pancake Day
March 12 – Daylight Saving Time Begins
March 13 – National K9 Veterans Day
March 17 – St. Patrick’s Day
March 20 – Spring Begins (changes annually)
March 25 – National Medal of Honor Day

April:

National Month:
National Stress Awareness Month

National Week:
April 9-15 – National Library Week

National Days:
April 1 – April Fools’ Day
April 4 – National School Librarian Day
April 6 – National Student-Athlete Day
April 7 – National Education and Sharing Day (changes annually)
April 10 – National Encourage a Young Writer Day
April 11 – National Pet Day
April 15 – Tax Filing Deadline (typically, but may vary)
April 16 – Easter (changes annually)
April 16 – National Stress Awareness Day
April 20 – National Get to Know Your Customers Day (Third Thursday of Each Quarter)
April 20 – Volunteer Recognition Day
April 21 – National Kindergarten Day
April 22 – Earth Day
May:

National Month:
National Military Appreciation Month

National Weeks:
May 1-5 – Substitute Teacher Appreciation Week (First Week in May)
May 7-13 – Public Service Recognition Week

National Days:
May 4 – National Star Wars Day (“May the 4th be with you”)
May 5 – Cinco de Mayo
May 9 – National Teacher Appreciation Day
May 10 – National School Nurse Day
May 14 – Mother’s Day (Second Sunday in May)
May 19 – National Pizza Party Day (Third Friday in May)
May 20 – Armed Forces Day
May 29 – Memorial Day

June

National Month:
National Great Outdoors Month

National Days:
June 1 – National Say Something Nice Day
June 6 – D-Day and National Higher Education Day
June 12 – National Children’s Day
June 14 – Flag Day
June 18 – Father’s Day
June 20 – American Eagle Day
June 21 – First Day of summer (changes annually)
July

National Month:
National Ice Cream Month

National Days:
July 1 – International Joke Day
July 4 – Independence Day
July 6 – National Fried Chicken Day
July 11 – All American Pet Photo Day
July 23 – National Parents’ Day (Fourth Sunday in July)
July 26 – National Aunts’ & Uncles’ Day

August

National Month:
National Back-to-School Month

National Days:
Aug. 6 – American Family Day (First Sunday in August)
Aug. 7 – Purple Heart Day
Aug. 11 – National Sons’ and Daughters’ Day
Aug. 11 – National Presidential Joke Day
Aug. 16 – National Tell a Joke Day
Aug. 26 – Women’s Equality Day

September

National Month:
National Hispanic Heritage Month

National Days:
Sept. 2 – National College Colors Day
Sept. 4 – Labor Day
Sept. 8 – International Literacy Day
Sept. 11 – Patriot Day and National Day of Service and Remembrance
Sept. 15 – National Online Learning Day
Sept. 26 – National Voter Registration Day (Fourth Tuesday in September)
Sept. 30 – National Family Health & Fitness Day (Last Saturday of September)

**October:**

**National Month:**
National Cybersecurity Awareness Month

**National Week:**
Oct. 16-20 – National Retirement Security Week (Third Week in October)

**National Days:**
Oct. 1 – International Coffee Day
Oct. 9 – Columbus Day
Oct. 31 – Halloween

**November:**

**National Months:**
National Native American Indian Heritage Month
National Scholarship Month

**National Weeks:**
Nov. 16-22 – American Education Week
Nov. 20-24 – National Family Week

**National Days:**
Nov. 1 – National Stress Awareness Day
Nov. 5 – Daylight Saving Time Ends (First Sunday in November)
Nov. 7 – Election Day
Nov. 11 – Veterans Day
Nov. 23 – Thanksgiving
December:

National Month:
National Universal Human Rights Month

National Days:
Dec. 2 – Special Education Day
Dec. 6 – St. Nicholas Day
Dec. 7 – National Pearl Harbor Remembrance Day
Dec. 12 – Chanukah Begins
Dec. 15 – Bill of Rights Day
Dec. 21 – Winter Solstice
Dec. 24 – Christmas Eve
Dec. 25 – Christmas
Dec. 26 – Kwanzaa Begins
Dec. 31 – New Year’s Eve
TAB 10
Fiduciary Duties

February 22, 2017
John H. Walsh
Partner
Three Critical Questions

1. What are fiduciary duties?
2. What should we be doing?
3. How can we test ourselves?
1. What Are Fiduciary Duties?
Foundation

- Trust

- When someone enters into a relationship of trust and confidence with you, that makes you a fiduciary
  - Spouses
  - Parents
  - Religious
  - Doctors
  - Executors
  - Lawyers

- The duty applies in business
“Many forms of conduct permissible in a workaday world for those acting at arm’s length are forbidden to those bound by fiduciary ties. A trustee is held to something stricter than the morals of the market place. Not honesty alone, but the punctilio of honor the most sensitive, is then the standard of behavior.”

- Judge Cardozo in Meinhard v. Salmon, Court of Appeals of New York (1928)
Many scholars say fiduciary duties come from morality.

Roscoe Pound, a famous legal scholar, said:
- Due care
- Fair conduct of a fiduciary
- Good faith

All come from morals, and involve an idea of “fairness or reasonableness”.
Other scholars say fiduciary duties come from natural law.

Societies around the world and in different times have all recognized something like a fiduciary duty:

- Hebrew
- Christian
- Roman
- Chinese
Currently, many scholars point to how fiduciary duties create economic value

- Having known terms between a fiduciary and beneficiary simplifies relationships
- A generalized duty:
  - Enhances the fiduciary’s ability to serve the beneficiary, especially in regards to unanticipated risks & opportunities
  - Reduces the beneficiary’s cost of oversight and monitoring
What Does This Mean?

- Serving as a fiduciary should be familiar to you
  - If you have a spouse, child, minister, doctor, executor, or lawyer, you already have experience with fiduciary duties

- Plus, in one form or another, you already understand the spirit behind the duties
  - Morality
  - Cultural Awareness
  - Efficiency
Perhaps Most Important

— Attitude

— Before you think about the specifics you should have the right frame of mind
  • Even though being a fiduciary is a widespread relationship
  • It is a special relationship
  • Judge Cardozo says, fiduciaries are on “a level higher than that trodden by the crowd”
2. What Should We Be Doing?
Fiduciaries Have Two Specific Duties

Duty of Loyalty

- This means that the fiduciary must put the beneficiary’s interests first (within the scope of the duty)

- Initial Thoughts:
  • Conflicts of interest are the biggest risk
  • Conflicts can cause the fiduciary to give preference to someone other than the beneficiary

Duty of Care

- This means that the fiduciary must use reasonable effort and diligence in serving the beneficiary

- Initial Thoughts:
  • This is a standard of conduct not of performance
  • Actions will be judged as of the time of the action, not by hindsight
Duty of Loyalty

— A fiduciary is strictly prohibited from engaging in transactions that involve self-dealing or that otherwise involve or create a conflict between his or her fiduciary duties and personal interests
  • Restatement of the Law of Trusts § 78

— Why is the standard so strict?
  • “To remove altogether the occasions of temptation”
What Can You Do?

— Follow the Ethics Policies
  • By addressing specific issues (like gifts and personal investments), the ethics policies will help you avoid accidental episodes of disloyalty

— Also, always ask for Legal or Compliance advice
  • You will avoid accidental disloyalty
  • You will show your good faith
  • You will avoid problems instead of having to fix them after-the-fact
Duty of Care

- The fiduciary has a duty to act as a prudent person would, through the exercise of reasonable care, skill, and caution
  - Restatement of the Law of Trusts § 77

- Can you listen to advice?
  - Yes!
  - “As necessary or appropriate to informed decision making, care may also call for obtaining and considering the advice of others on a reasonable basis”
What Can You Do?

— Because this is a **conduct** standard, our focus will be on your actions

— To be prudent, when making business decisions, your actions:
  • Should be on an informed basis
  • Should be in good faith
  • Should be made in the honest belief that the action taken is in the best interests of the company

— *See In re Walt Disney Company*, Supreme Court of Delaware (2006)
Take Away

Duty of Loyalty

— Learn the Ethics Policies
— Commit to following it
— Do not hesitate to contact Legal or Compliance any time a question arises
— Make sure everyone around you (such as spouses) understands the importance of your work as a trustee

Duty of Care

— Be informed by asking questions
— Take the board books seriously
— Join the discussion, ask questions, and keep asking until you’re satisfied
— Form an honest belief about the best interests of the TRS in each setting
3. How Can We Test Ourselves?
Methods

— How can a board test its performance?
— There are several methods
  • Independent Third Party Assessment
  • Self-Assessment
  • Learning by Doing
— We will focus on learning by doing
Learning By Doing

– You do not have to wait for a formal assessment
– As a board, and as individual trustees, you can ask questions, raise topics for consideration, and generally make sure everyone – you, your fellow trustees, and the staff – are constantly evaluating the board’s work
Ten Questions to Consider
#1 What Is Our Mission?

- This is a really good question for any board
- But even more so in the public sector
  - Private companies can say: to make a profit
  - Public sector entities have different stakeholders and more diverse potential considerations
- Self-Testing Questions:
  - Have you thought about this?
  - Have you talked about it on the board?
  - Ask yourself, as a trustee, what is my mission?
#2 Do We Have A Strategic Vision?

- It’s not enough to have a mission, you should also have a vision for how you expect to accomplish the mission.

- Not only what you hope to accomplish, but a path for getting there.
  - Some boards require written strategic plans.
  - Others are less formal.

- Self-Testing Questions:
  - Do we have a vision?
  - Have you talked about it with your fellow trustees?
  - Have you asked the staff about it?
#3: Do We Hold Each Other Accountable?

- The board is a collective body
- That means governance is through your collective action
- For it to work properly, we all must hold each other accountable

Self-Testing Questions:
- Are you comfortable reminding other trustees of your mission and their responsibilities?
- How does the board respond when this happens?
- Are we sharing information amongst ourselves so that each trustee has the same starting point to review issues?
#4 What Does The Staff Do?

You should have a good sense of the division of responsibility between you and the staff

- You don’t want to push the staff aside and try and do its job
- But you don’t want to just defer to the staff and ignore your own responsibilities

Self-Testing Questions:

- As a trustee, what is your understanding of the difference between what the staff does and what the trustees do?
- Have you familiarized yourself with the statutory requirements and by-laws that direct and shape the work of both trustees and staff?
- Have you discussed this on the board and with the staff?
#5 What Expertise Do We Need?

- Trustees are not expected to have personal expertise in every topic that comes before the board
  - Remember the *Restatement* – you may ask questions
  - That’s why you have staff and outside experts

- Self-Testing Questions:
  - Are we getting the right expertise?
  - Are the experts explaining things to us so we can understand and act on their information?
#6 Do We Hold The Staff Accountable?

– An important role of any board is to hold the staff accountable

– Self-Testing Questions:
  • Every time the staff makes a proposal, do we ask: How will we hold them accountable for this?
  • Periodically, do we ask the staff for reports on their own performance, and demand candor and substantiation of every assertion?
  • Finally, are there real consequences, for the staff, for success, and failure?
#7 How Do We Manage Risk?

- Risk management is a serious matter in every enterprise, but especially for one that must plan to meet obligations far in the future.

- Boards have special responsibilities here.

- Self-Testing Questions:
  - Have we talked on the board about our organizational risk appetite and strategy?
  - Has the staff presented a good risk management plan?
  - What have they done to validate to you that it is an appropriate plan for TRS?
  - Have there been surprises?
#8 What is Our Role in Compliance?

- Compliance is another critical area with a need for board involvement.
- Regulators all want to see a good “tone at the top” – and that starts with the board.
- Tone at the top also needed for organizational ethics.
- Self-Testing Questions:
  - Are you comfortable with the compliance information provided by the staff: goals, policies, monitoring practices, incidents, and responses?
  - Are you and the other trustees sending the right messages to the staff about compliance and ethics?
  - Are you communicating regularly with the staff when compliance and ethics issues arise?
#9 How Do We Manage Internal Controls?

- The financial management of an enterprise is a critical area for board oversight

- In particular, the board is expected to play an active role in demanding a good internal control system, to ensure that the numbers are accurate

- Self-Testing Questions:
  - Has the staff presented a comprehensive plan for providing financial internal controls?
  - Have they done a good job of identifying potential exposures and mitigating controls?
  - Are we making effective use of internal and external auditors?
#10 What Metrics Do We Use?

– There is an old saying: “If you can’t measure it, it didn’t happen”
  • Every organization lives by its metrics
  • Boards, in particular, need metrics to accomplish their other tasks

– Self-Testing Questions:
  • Have we been asked, as a board, to work with the staff on the metrics they present to us?
  • Do we actively review those metrics and discuss their meaning and importance?
Conclusion

- Fiduciary duties should be familiar to you
- You implement them though a duty of loyalty and a duty of care
- There are questions you can ask, as you go about the business of the board, to test your work and how well you are doing
- Most importantly, as trustees:
  - Talk about these issues, both with your fellow trustees, and with the staff
Questions?
Moving Forward
to Better Serve Our Members

Audit, Compliance and Risk Management Oversight

Presenters Amy Barrett, Heather Traeger, Jase Auby and Jay LeBlanc
Agenda

✓ Oversight Areas
✓ The Three Lines of Defense
✓ Interwoven But Not Overlapping
  → Investment Risk Management (IRM)
  → TRS Compliance
  → Enterprise Risk Management (ERM)
  → Internal Audit
✓ Oversight Case Study: External Public Markets
✓ Oversight Process Action Items
Many areas work together to conduct oversight of TRS Investment Portfolios directed by Board Policies:

IRM – Investment Risk Management
IMC – Investment Management Committee
IIC – Internal Investment Committee
The Three Lines of Defense

TRS oversight areas are organized into “lines of defense”:

1st Line of Defense (Operations):
- IMD Profit Centers
- Investment Risk Management
- Investment Management Committee (IMC)
- Internal Investment Committee (IIC)
- Legal and Compliance
- Investment Operations

2nd Line of Defense (Oversight, Compliance & Risk Management):
- Investment Risk Management
- Legal and Compliance
- Enterprise Risk Management (ERM)
- Investment Accounting
- Information Security

3rd Line of Defense (Independent Assurance & Advisory):
- Internal Audit
- External auditors hired by TRS
- Board Advisors

**Interwoven, But Not Overlapping**

**Investment Risk Management (IRM)**

**Purpose**
To enable efficient risk taking through the management and monitoring of risk

**History/Evolution**
- The Investment Risk Committee of the Board and the IMD’s investment risk function were formed in 2007
- IMD risk management is overseen by the Chief Risk Officer (CRO)
- The IMD risk group has grown from one employee in 2007 to seven employees today
- The 2008 Global Financial Crisis emphasized the need for research into market regimes, bubbles and valuation to augment traditional risk monitoring activities

**Key Activities**
- **Managing Risk**: Risk Signals, Risk Strategies, Risk Budgeting
- **Monitoring Risk**: Risk Reporting, Risk Certification, Compliance Issues Response
Interwoven, But Not Overlapping

TRS Compliance

Purpose
- To foster an ethical and compliance culture and behavior at TRS consistent with TRS Core Values
- To strengthen and protect organizational value by (1) advising, educating and training on regulations, laws and policies and (2) preventing, detecting and correcting policy violations

History/Evolution
- Investment Compliance (IC) function: IMD → Internal Audit → Legal Services
- TRS Compliance created by combining IC and certain ethics compliance functions
- FTEs: TRS Chief Compliance Officer & Compliance Counsel; compliance specialists
- Restructure and enhance scope and functionality of TRS Compliance
- TRS Compliance reporting to Audit Committee
- Legal Services renamed Legal & Compliance

Key Activities
- TRS ethics-related issues and policies (including, Ethics, FWAP, Personal Trading, MNPI, Hotline)
- Consult and advise on policies, internal controls, legislation, and regulation
- Coordinate with TRS departments to promote ethics and compliance
- Investment Compliance function
Interwoven, But Not Overlapping

Enterprise Risk Management (ERM)

Purpose
To identify risks that can keep us from achieving our goals and objectives. We do this by coordinating and facilitating risk assessments across TRS

History/Evolution
- April 2007 - TRS dedicates one FTE to ERM implementation. Reports to Chief Audit Executive (CAE)
- September 2008 – Executive Director authorizes the creation of a formal ERM program. This includes the formation of the Risk Oversight Committee (ROC)
- August 2009 – Executive Director presents the first “Stoplight Report” to the Board of Trustees
- September 2010 – Executive Director establishes the Office of Risk Management and Strategic Planning. Staff transfers out of Internal Audit and ERM reports to Ken Welch
- September 2011 – Bylaws of the Board of Trustees state that ERM report risk and control activities to the Risk Management Committee of the Board
- November 2013 - Executive Director establishes the Division of Strategic Initiative. ERM reports to Rebecca Merrill to better align ERM and Strategic Planning

Key Activities
- Enterprise Risk Management, Strategic Planning, Business Continuity, Safety, Insurance
Interwoven, But Not Overlapping

Internal Audit

Purpose
To enhance and protect organizational value by providing risk-based and objective assurance, advice, and insight

History/Evolution
- Statutorily required by the Texas Internal Auditing Act (1993)
- Part of TRS for almost 40 years
- Four Chief Audit Executives (CAE)
- Started Enterprise Risk Management (ERM) function at TRS
- Administered investment compliance for five years

Key Activities
- Assurance on operations, financial, and compliance risks across TRS
- Internal consulting, as requested
- Informal internal advisory such as inputs to policies, training on controls, coordination of outside auditors, and non-voting participation in key meetings
The following case study illustrates how oversight is applied to one investment group: External Public Markets (EPU)

- EPU manages $37.2 billion allocated to 37 long-only equity managers and 39 hedge fund managers (28% of the total Trust) as of September 30, 2016
The External Manager investment process is as follows:

1. **Strategy Development**
   - IPS and Ethics Policies Updates
   - Portfolio Allocation and Strategy

2. **Manager Selection**
   - Premier List
   - Certification Process/Pre-Deal Approval
   - Deal Approval

3. **Portfolio Administration**
   - Portfolio Risk Monitoring and Reporting

4. **Post Investment**
   - Compliance Monitoring and Reporting
   - Enterprise Risk Management
   - Assurance
✓ Amend TRS bylaws to change Audit Committee to Audit and Compliance Committee

✓ Address Funston Report recommendations
   → Compliance Charter
   → Compliance map for Trustee training
   → Coordination of Audit and Compliance Testing
   → Coordination of Compliance reporting
Appendix
### Oversight Case Study: External Public Markets

#### 1. IPS and Ethics Policies Updates

<table>
<thead>
<tr>
<th>Committee</th>
<th>Inputs/Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board Policy Committee</td>
<td>Approval of Policies</td>
</tr>
<tr>
<td>Fiduciary Counsel and Board Advisors</td>
<td>Inputs to Policy updates</td>
</tr>
<tr>
<td>TRS Compliance</td>
<td>Inputs to Policy updates</td>
</tr>
<tr>
<td>Legal Investments</td>
<td>Advise on programmatic/legislative changes</td>
</tr>
<tr>
<td>Internal Audit</td>
<td>Inputs to Policy updates</td>
</tr>
<tr>
<td>Investment Risk Management</td>
<td>Inputs to Investment Policy updates</td>
</tr>
</tbody>
</table>

#### 2. Portfolio Allocation and Strategy

<table>
<thead>
<tr>
<th>Committee</th>
<th>Inputs/Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board Investment Committee</td>
<td>Review of program reports</td>
</tr>
<tr>
<td>Board Advisors</td>
<td>Review of program</td>
</tr>
<tr>
<td>IMD Management Committee</td>
<td>Review of new strategies</td>
</tr>
<tr>
<td></td>
<td>Review of investment process</td>
</tr>
</tbody>
</table>

#### 3. Premier List

<table>
<thead>
<tr>
<th>Committee</th>
<th>Inputs/Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board</td>
<td>Receipt of report annually</td>
</tr>
<tr>
<td>IMD Advisors</td>
<td>Review and discussion with TRS</td>
</tr>
</tbody>
</table>
## Oversight Case Study: External Public Markets

### 4 Certification Process/Pre-Deal Approval

<table>
<thead>
<tr>
<th>IMD Advisors</th>
<th>Due diligence, consultant report, prudence letter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Investments</td>
<td>Advise on contract and ISDA* agreement, fee and term negotiations</td>
</tr>
<tr>
<td>TRS Compliance</td>
<td>Ethics policies administration (e.g., conflicts)</td>
</tr>
</tbody>
</table>

*ISDA – International Swaps and Derivative Association

### 5 Deal Approval (continued)

<table>
<thead>
<tr>
<th>Investment Risk Management</th>
<th>IIC participation as a voting member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Investments</td>
<td>Risk certification process</td>
</tr>
<tr>
<td>Internal Investment Committee (IIC)</td>
<td>Deal approval below an established threshold</td>
</tr>
<tr>
<td>TRS Compliance</td>
<td>IIC attendance</td>
</tr>
<tr>
<td>Internal Audit</td>
<td>Compliance review (e.g., statutory, regulatory, policy)</td>
</tr>
</tbody>
</table>

### 5 Deal Approval

<table>
<thead>
<tr>
<th>Board</th>
<th>IIC attendance and veto right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review reporting (e.g., transparency report)</td>
<td></td>
</tr>
<tr>
<td>Approve (when applicable)</td>
<td></td>
</tr>
<tr>
<td>Board Investment Committee</td>
<td>Deal review/recommendation above established thresholds</td>
</tr>
<tr>
<td>Staff reports</td>
<td></td>
</tr>
<tr>
<td>Executive Director</td>
<td>IIC attendance and veto right</td>
</tr>
</tbody>
</table>

*ISDA – International Swaps and Derivative Association*
## Oversight Case Study: External Public Markets

### Portfolio Administration

<table>
<thead>
<tr>
<th>Board</th>
<th>Legal Investments</th>
<th>Investment Operations</th>
<th>Investment Accounting</th>
<th>TRS Compliance</th>
<th>IMD Advisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Custodian selection</td>
<td>• Advise on custody agreement</td>
<td>• Funding request administration</td>
<td>• Interface with custodian</td>
<td>• Input on custody agreement</td>
<td>• Monitor/verify fees</td>
</tr>
<tr>
<td>• Approves General Authority Resolution</td>
<td></td>
<td>• Account Opening and Maintenance</td>
<td>• Accounting and financial reporting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Administration of Custody Services</td>
<td>• Wire transfer review/administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ISDA* agreements</td>
<td>• Valuation review/confirmation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Portfolio Risk Monitoring and Reporting

<table>
<thead>
<tr>
<th>Board Risk Committee</th>
<th>Board Advisors</th>
<th>IMD Management Committee</th>
<th>Investment Risk Management</th>
<th>Investment Operations</th>
<th>Investment Accounting</th>
<th>TRS Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Review investment risk reports</td>
<td>• Performance reports to the board</td>
<td>• Portfolio monitoring</td>
<td>• Quantitative risk analysis</td>
<td>• Derivative monitoring</td>
<td>• Monitor unfunded commitment amounts (when applicable)</td>
<td>• Compliance monitoring and violation resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Risk signals (CUSUM)</td>
<td>• Calculation, verification and tracking of fees</td>
<td>• Monitor/verify monthly fee accruals</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Derivatives usage monitoring</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*ISDA – International Swaps and Derivative Association*
Oversight Case Study: External Public Markets

8. Compliance Monitoring and Reporting
- Board Risk, Audit and Ethics Committees
  - Review and evaluation of compliance reports
- TRS Compliance
  - IPS Policy compliance monitoring, reporting and resolution, regulatory reporting
  - Personal Trading Policy and Fraud, Waste, and Abuse Prevention (FWAP) administration
- Investment Risk Management
  - IPS Policy compliance violation resolution and remediation

9. Enterprise Risk Management
- Board Risk Committee
  - Enterprise Risk Management risk assessment and mitigation plan reports
- Executive Director
  - Chair of Risk Oversight Committee
- Enterprise Risk Management Team
  - Risk and controls facilitator for stoplight report
  - Risk Oversight Committee coordinator
- TRS Compliance
  - Participation in Risk Oversight Committee
- Legal Investments
  - Participation in Risk Oversight Committee
- Internal Audit
  - Participation in Risk Oversight Committee
- Investment Risk Management
  - Participation in Risk Oversight Committee
Oversight Case Study: External Public Markets

Assurance

Board Audit Committee
- Assurance reports receipt and direction

Internal Audit
- Assurance reports to the Audit Committee
- Coordination of the State Auditor’s Office Activities

State Auditor’s Office
- Assurance reports to Legislative Audit Committee
TAB 15A
Trend And The End Of Globalization?

Ruchir Sharma
What Is Globalization?

A period in which new technologies and new policies lead to …

• Large increase in global Trade flows
• Large increase in global Capital flows
• Large increase in global Migration flows
Globalization Advances and Retreats in Long Waves

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870 – 1913</td>
<td>First Wave of Globalization</td>
</tr>
<tr>
<td>1914 – 1945</td>
<td>First Wave of De-globalization</td>
</tr>
<tr>
<td>2008 – ??</td>
<td>Second Wave of De-globalization?</td>
</tr>
</tbody>
</table>
Echoes of the Interwar Era: Global Trade

Global Trade to GDP

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>5%</td>
<td>18%</td>
<td>30%</td>
<td>10%</td>
<td>16%</td>
<td>30%</td>
<td>60%</td>
<td>55%</td>
</tr>
</tbody>
</table>

1870 – 1913: First wave of globalization
1914 – 1945: Interwar period
1970s – 2008: Second wave of globalization

Source: Klasing and Milionis (2014), Estavadeordal, Frantz and Taylor (2003), Penn World tables, MSIM calculations
Now Capital Flows Have Fallen Back to the 1980 Level

Global Cross-Border Banking Flows

The Flow of People Is Slowing

Cumulative Net Migration from EM to DM Countries

Millions of People

<table>
<thead>
<tr>
<th>Period</th>
<th>Millions of People</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986 – 1990</td>
<td>7</td>
</tr>
<tr>
<td>1991 – 1995</td>
<td>12</td>
</tr>
<tr>
<td>1996 – 2000</td>
<td>13</td>
</tr>
<tr>
<td>2001 – 2005</td>
<td>16</td>
</tr>
<tr>
<td>2006 – 2010</td>
<td>16</td>
</tr>
<tr>
<td>2011 – 2015</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: UN Population Database, Haver Analytics. Data as of 2Q – 2016
Net Migration to the United States Is Down, Too


Number of Immigrants (Thousands)

Deglobalization Is One Factor Making Rapid Growth Even Rare

Average Number of Countries Growing at 7 Percent Growth Rate

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Number of Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003 – 2007</td>
<td>52</td>
</tr>
<tr>
<td>2008 – 2015</td>
<td>27</td>
</tr>
<tr>
<td>2016</td>
<td>6</td>
</tr>
</tbody>
</table>

Number of Countries (Out of 188 Countries)

Source: MSIM Calculations, IMF, Haver Analytics
The Revolt Against Incumbent Politicians Rolls On…

Incumbents Have Been Losing More and More Elections Since the Global Financial Crisis

Share of Elections With Incumbent Victories (50 Most Populated Democracies)

Source: MSIM Emerging Markets Calculations. Data taken from various news sources and political research. 50 most populated democracies.
Leading to Economic Experiments in the Developed World

“How Trump-o-nomics Will Bring Back the ’80s”

“Trump’s trade policies become more shocking by the day”

“Wake up Wall St: There’s more to Trump’s tax policy than cuts”

“Foreign Secretary: U.K. ‘first in line’ for free trade deal with U.S.”

“Theresa May: U.K. cannot keep ‘bits’ of EU membership”

“More Britons want greater control of immigration than EU free trade-poll”

Source: Wikimedia Commons, Trump quotes taken from various publications from November 2016 to January 2017 and Theresa May quotes taken from July 2016 to January 2017, Quotes taken from Google News
… And the Emerging World

“India Changes GDP Calculation Method”

“Narendra Modi Bans India's Largest Currency Bills”

“Hungary mandates pro-government ads for banks in loan program”

“Hungary is cutting its corporate tax rate below every country except notorious havens”

“Poland backs lower retirement age”

“Poland dismantles private funds in pension revamp”

Source: Wikimedia Commons. Quotes taken from Google News and were spoken between June 2015 to January 2017
…. And to Nationalist Attempts to Divert Popular Attention

“Russia’s in the Tank, But Putin Rides High”

“Economy slumps but Putin Soars”

“In Russia, It’s Not the Economy, Stupid”

“As Erdogan cracks down on free press, journalists leave dire warning as they flee”

“In University Purge, Turkey’s Erdogan Hits Secularists and Boosts Conservatives”

Outsourcing as a Model Is Under Threat

More People Pick Apples Than Work for Apple Inc. in the U.S.

Number of Jobs

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Inc. Employees in the U.S.</td>
<td>66,000</td>
</tr>
<tr>
<td>Apple Orchard Picking Jobs in the U.S.</td>
<td>70,000</td>
</tr>
<tr>
<td>Apple Inc. Supplier Jobs, Most Outside the U.S.</td>
<td>1,600,000</td>
</tr>
</tbody>
</table>

Source: MSIM Research, Apple, NPR, Engadget. Data as of 4Q-2016
The Edge Shifts to Less Export-Dependent Countries

Exports to GDP (%)

Source: IMF MSIM EM Research as of September 2016, Green are countries we like in EM
Globalization Held Inflation in Check

Before 2008, Rising Trade Competition Helped Contain Inflation

Trade to GDP (%) and Inflation (Y-o-Y %)

Source: MSCI Calculations, IMF, WB, Haver Analytics. Data as of 2014 *Estimates are subject to change and may not actually come to fruition
...And That Check Is Weakening

The Rise of Anti-Global Populists Like Trump Has Raised Inflation Expectations

U.S. 10-Year Breakeven Inflation Rate (%)

Source: Factset as of December 2016
Signs That Wage Pressures Are Rising

More Money for Middle America?

U.S. Atlanta Fed Wage Tracker (y/y%, 3mma)

Source: Atlanta Federal Reserve as of December 2016
Power Is Shifting Back to Workers

U.S: Labor Share and Profit Share as % of GDP

Source: Goldman Sachs, BEA. Data as of December 2016
Peak Bond Bubble

Decadal Winners 1950 – 2000

2010’s winners

2010’s Winners: G-3 Government Bonds

* Equally weighted U.S., Japan, Germany 30yr Government Bond Total return.
Deglobalization Could Lead to Low Growth, Higher Inflation

The Deglobalization Period After 1914 Saw Weaker Growth With Higher Inflation

<table>
<thead>
<tr>
<th>Period</th>
<th>Global GDP</th>
<th>Global Inflation (proxied w/US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1820 – 1870</td>
<td>0.9%</td>
<td>0.7%</td>
</tr>
<tr>
<td>1871 – 1913</td>
<td>2.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>1914 – 1950</td>
<td>1.8%</td>
<td>2.5%</td>
</tr>
<tr>
<td>*1990 – 2008</td>
<td>3.6%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Source: MSIM Research, Maddison database, Global Financial Data.
* Note: 1990 used to capture globalization effect as start date due to high inflation outliers in 1970s – 80s
The King Kong Dollar Keeps Climbing

U.S. Real Effective Exchange Rate

The Cheap “Fay Wray” Currencies - DM

Competitiveness Index Based on REER and Purchasing Power Parity (PPP)

Source: MSIM EM Research, Haver Analytics, BIS, IMF, JPM, Wikimedia Commons, Google Images as of December 2016
The Cheap “Fay Wray” Currencies-EM

Currency Competitiveness Index Based on REER and Purchasing Power Parity (PPP)

Source: MSIM EM Research, Haver Analytics, BIS, IMF, JPM, Wikimedia Commons, Google Images as of December 2016
Rising Geopolitical Tensions

Geopolitical Tensions Increase Under Multipolarity

Number of Interstate and Internationalized Internal Conflicts (1)

1. [ ]

Hegemonic Instability (USSR collapse)
Rising Defense Spending

Global Defense Spending

US$Bn

<table>
<thead>
<tr>
<th>Year</th>
<th>U.S.</th>
<th>Germany</th>
<th>Japan</th>
<th>China</th>
<th>India</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1,000</td>
<td>500</td>
<td>1,000</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>2030E</td>
<td>2,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Summary

• When globalization retreats, the retreat in flows of goods, money and people tends to last

• Deglobalization, depopulation and deleveraging will lead to continued low global growth

• Slow growth is fuelling anti-establishment revolt – sometimes for the better

• As anti-global populists rise, the checks on inflation are falling

• Tax policy is the new protectionist policy
Implications for Markets and Strategic Portfolios

• Strong domestic economies, and companies, have the edge: outsourcing and MNCs may be out

• Secular low in inflation and interest rates behind us

• Rising inflation and interest rates do not favour bonds; inflation hedges favoured

• The King Kong Dollar keeps marching – look for weak “Fay Wray” currencies

• Increasing geopolitical tension to benefit defence sector globally

• Country dispersion to matter even more in an era of deglobalization
APPENDIX
Capital Flows Peaked in 1914, Did Not Recover Till 1990s

Global Capital Mobility – a Measure of the Scale and Ease of Capital Flows – since 1860

During Rapid Advances in Globalization, Inequality Rose

Income Inequality in the United States
Percentage Income Received by Top 1% of Households in U.S.

This Time Was No Different

Share of U.S. Household Wealth by Income Level

U.S. Top 0.1% Hold the Same Amount of Wealth as Bottom 90%

Source: DB, Data estimated by Berkely professors Seaz and Zucman using capitalised income tax returns. QJE May 2016
In One Region, Revolt is Bringing Reformers to Power: Latin America

“Argentina pays off ‘holdout’ bondholders, elevating hopes for economy”

“Argentina rakes in cash from new tax law”

“Brazil’s Acting President Michel Temer Vows to Tackle Insolvent Pension System”

“Michel Temer to pursue tax reform in 2017”

“Peru’s Congress approves Kuczynski’s economic reform package”

“Will Kuczynski unlock Peru’s economic potential?”

Source: Wikimedia Commons Quotes Taken from April 2016 to January 2017 and taken from Google News.
The Center Holds: European Populists Still a Minority

Latest Polls for Euro Area Populist Parties, in the First Round of the Next Elections

<table>
<thead>
<tr>
<th>Party</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative for Germany (Germany)</td>
<td>13%</td>
</tr>
<tr>
<td>National Front-1st Round (France)</td>
<td>25%</td>
</tr>
<tr>
<td>5 Star Movement-1st Round (Italy)</td>
<td>29%</td>
</tr>
<tr>
<td>Freedom Party of Austria (Austria)</td>
<td>34%</td>
</tr>
<tr>
<td>Party of Freedom (Netherlands)</td>
<td>36%</td>
</tr>
</tbody>
</table>

Trump Has Promised a Tax Revolution

Current U.S. Corporate Income Tax and Trump Proposal

<table>
<thead>
<tr>
<th>(%)</th>
<th>Current</th>
<th>Trump Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>35%</td>
<td>15%</td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
…Which Could Trigger a Race to the Bottom for Corporate Taxes

Combined Corporate Income Tax (2016), Select Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Effective Tax Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. (Current)</td>
<td>39</td>
</tr>
<tr>
<td>India (Current)</td>
<td>35</td>
</tr>
<tr>
<td>Germany</td>
<td>30</td>
</tr>
<tr>
<td>Mexico</td>
<td>30</td>
</tr>
<tr>
<td>Japan</td>
<td>30</td>
</tr>
<tr>
<td>Korea</td>
<td>24</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>19</td>
</tr>
<tr>
<td>U.S. (Projected)</td>
<td>15</td>
</tr>
</tbody>
</table>

Average: 15

Source: MSIM EM Research
The End of the Party for Multinationals

Revenues from Abroad Are in Decline, as a Share of Total Revenue

US S&P 500 Revenues from Abroad / Total (%)

Source: BCA. Data as of December 2016.
In The Past, Export Powers Grew Faster

GDP per Capita and Export Growth

1980 – 2015
Exports per Capita Growth Rate (1980 – 2015)

Source: BCA, WDI, Haver Analytics.
TAB 15B
Moving Forward
to Better Serve Our Members

Last Five / Next Five
Britt Harris, Chief Investment Officer
### TRS IMD: Last Five Years

#### As of 9/30/2016

<table>
<thead>
<tr>
<th></th>
<th>Last 5-Years</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Return</strong></td>
<td>9.2%</td>
<td>8.0%</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>5.9%</td>
<td>11.0%</td>
</tr>
<tr>
<td><strong>Inflation</strong></td>
<td>1.2%</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Sharpe Ratio</strong></td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Real Return</strong></td>
<td>8.0%</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

#### Rank (%-ile)

<table>
<thead>
<tr>
<th></th>
<th>Return</th>
<th>Risk¹</th>
<th>Return/Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32</td>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

#### TRS vs Peer Average³

<table>
<thead>
<tr>
<th></th>
<th>Actual ($)</th>
<th>Projected ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trust Value²</strong></td>
<td>134.0</td>
<td>133.9</td>
</tr>
<tr>
<td><strong>Investment Returns</strong></td>
<td>51.8</td>
<td>46.6</td>
</tr>
<tr>
<td><strong>Total Contributions</strong></td>
<td>25.3</td>
<td>24.0</td>
</tr>
<tr>
<td><strong>Members</strong></td>
<td>13.0</td>
<td>12.0</td>
</tr>
<tr>
<td><strong>State/District</strong></td>
<td>12.3</td>
<td>12.0</td>
</tr>
<tr>
<td><strong>Payouts</strong></td>
<td>45.0</td>
<td>43.9</td>
</tr>
</tbody>
</table>

#### 2016 vs 2011

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funded Status</strong></td>
<td>79.7%</td>
<td>75.8%</td>
</tr>
<tr>
<td><strong>Contributions</strong></td>
<td>15.4%</td>
<td>~31%</td>
</tr>
<tr>
<td><strong>(Employer/ Member)</strong></td>
<td>(7.7%/ 7.7%)</td>
<td>(~20%/~11%)</td>
</tr>
<tr>
<td><strong>Benefits⁴</strong></td>
<td>52%</td>
<td>82%</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>22.6 Years</td>
<td>13-20 Years</td>
</tr>
</tbody>
</table>

---

**Source:** Aon Hewitt, TRS IMD, GRS

¹ Risk rank shown in inverse

² Trust Market Value

³ Funded status Peers include all public plans greater than $20 B. Contribution/Benefit Peers include all Teacher retirement systems that do not make contributions to Social Security

⁴ Source: TRS 2012 Pension Benefit Design Study. Reflects Relative Benefit Index, a measure of the value of retirement income provided to a prototypical career employee from retirement until the member no longer receives benefits. An index score indicates a plan provides a benefit with a value equal to the full salary replacement and cost living adjustments consistent with inflation. The impact of social security benefits are included as well, if applicable.
TRS IMD: Last Five Years

As of 9/30/2016

Global Equity

- US Equity: 15.1%
- Non-US Dev: 8.0%
- Em Markets: 4.2%
- Dir Hedge Fund: 4.4%
- Private Equity: 12.5%

Real Return

- TIPS: 2.0%
- Real Assets: 12.9%
- ENRI\(^1\): -4.3%

Stable Value

- Long Treasury: 6.3%
- Stable Value Hedge Fund: 3.9%
- Absolute Return: 14.4%

Risk Parity\(^1\): 5.5%

- Return: 6.4%
- Risk: 8.5%
- Sharpe: 1.3
- Corr. to GE: (-0.4)

- 10.2%
- 7.7%
- 0.8
- 1.0

- 8.3%
- 2.3%
- 3.6
- 0.3

Source: TRS IMD, State Street Bank, Aon Hewitt
\(^1\) 3-Year results, Risk Parity and ENRI do not yet have 5-year track records

Annualized Return vs. Annualized Standard Deviation
5 Years Ending September 30, 2016
Global Equity Regime: Monetary Policy Supported Markets

Central Bank Policy
- Fed Funds Rate (LHS, %)
- Fed Balance Sheet (RHS, $Tn)

Easy monetary policy has fueled a prolonged market rally

GDP Growth
- US Real GDP, YOY Growth

Growth is steady, but low

Inflation
- US inflation, YOY Change

Inflation remains below normal

Unemployment
- US Unemployment Rate

Labor markets have recovered

Private Spending
- Personal Consumption, YOY Change

Growth in private spending remains subdued

Labor Productivity
- US Labor Productivity
- Pre-GFC Trend

Labor Productivity is below-trend

Source: Bloomberg, Bureau of Labor Statistics, OECD
Last 5 Years: Top Priorities

20% Annual Productivity Improvement
# Preferred Destination: Principal Investments

<table>
<thead>
<tr>
<th></th>
<th>Private Equity</th>
<th>Real Assets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>25</td>
<td>36</td>
<td>61</td>
</tr>
<tr>
<td>Commitment ($,B)</td>
<td>$ 4.265</td>
<td>$ 9.620</td>
<td>$ 13.885</td>
</tr>
<tr>
<td>NAV ($,B)</td>
<td>$ 2.966</td>
<td>$ 5.485</td>
<td>$ 8.451</td>
</tr>
<tr>
<td>5 Year IRR</td>
<td>17.4%</td>
<td>15.0%</td>
<td>15.7%</td>
</tr>
<tr>
<td>Median Peer</td>
<td>9.6%</td>
<td>11.3%</td>
<td>10.8%</td>
</tr>
<tr>
<td>Value Added</td>
<td>7.7%</td>
<td>3.7%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Dollars Earned ($,B)</td>
<td>$ 1.230</td>
<td>$ 2.563</td>
<td>$ 3.793</td>
</tr>
<tr>
<td>Value Added ($,MM)</td>
<td>$ 394.6</td>
<td>$ 454.4</td>
<td>$ 848.9</td>
</tr>
</tbody>
</table>

Source: State Street Bank, TRS IMD and TUCS as of 9/30/2016. Median Peer Total represents a weighted average based on TRS allocation. Note: Principal investments are either commitments to a single investment and/or a single LP structure.
Bubble Risk Dilution

**Bubble Monitor**

- Equities
- Fixed Income
- Commodities
- Currencies
- Alternatives

**Economic Regime**

- Signal
- Forecast
- 2016
- 2015
- 2014
- 2008-2013

**New Investment Capabilities**

- Risk Parity
- Low Volatility

Source: Bloomberg, TRS IMD
Productivity

20% Annual Productivity Improvement

Better, Cheaper, Faster

Critical Processes

- Valuation
- Risk Management
- Relationship Management
- Trading
- Operations
- Culture
- Communications
- Recruitment/Retention

Process Mapping – External Manager Program

<table>
<thead>
<tr>
<th>Strategic Planning</th>
<th>Premier List Development</th>
<th>Certification Process</th>
<th>Risk Analysis</th>
<th>Final Fit Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review asset allocation</td>
<td>Initial manager proposal</td>
<td>Onsite visit conducted</td>
<td>Quantitative analysis</td>
<td>“Alpha Stacking” demonstrated</td>
</tr>
<tr>
<td>Evaluate Premier List needs</td>
<td>Perform minimum criteria analysis</td>
<td>Receive/review consultant report</td>
<td>Review of current portfolio (chars. &amp; valuations)</td>
<td>Determine initial and optimal size</td>
</tr>
<tr>
<td>Collaborative review by TRS, Aon Hewitt &amp; Albourne</td>
<td>Evaluate 9 critical areas</td>
<td>Prepare certification report</td>
<td>Develop optimized asset class structure</td>
<td></td>
</tr>
<tr>
<td>Add/reject proposed portfolio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ability to Act

Circle of Competence

Repeatable Practices

Bubble Risk

Strong Pricing skills
Competitive Advantage

Trust Level
- Long-Term
- Large
- Not levered
- Liquid

Policy
- Diversification
- Performance
- Collaboration
- Transparency

Circle of Competence
- Strategic Relationships
- Principal Investing
- Developing New Strategies
- TRS Dislocation Strategy
- Recruit and Retain Top Investor Talent
- World Class Agency Structure
Agency Structure

Board of Trustees
Nine Members Appointed for Six-Year Terms
Board Advisory Committees
- Audit
- Benefits
- Budgets
- Compensation
- Ethics
- Investment Management
- Policy
- Risk Management

Internal Investment Committee (IIC)
Nine Senior Members of Investment Division + Executive Director
- CIO
- Deputy CIO
- Asset Allocation
- Operations
- External Private Markets
- Trading
- Internal Investment Management
- External Public Markets
- Risk Management
- Executive Director (non-voting, veto power)

Standardized Regular Reporting Process with monthly reporting

Management Committee (MC)
Twelve Senior Members of Investment Division
- CIO
- Deputy CIO
- COS
- Operations
- Asset Allocation
- Trading
- Internal Investment Management
- External Public Markets
- Risk Management
- External Private Markets
- Strategic Partnership Research
- General Counsel
- Professional Development (Observer)

Ability to Act  Circle of Competence  Repeatable Practices  Bubble Risk  Strong Pricing skills

Board Responsibilities
- Establish long-term asset allocation policy
- Approve long-term return targets and risk parameters
- Provide appropriate resources, incentives and establish approved processes
- Establish appropriate reporting standards and metrics
- Comply with relevant laws
- Ensure professional audit systems
- Approve budget

IMD Responsibilities
- Implement investment policies within approved guidelines
- Maximize effectiveness of resources provided
- Deliver transparent reporting
- Comply with relevant laws
- Collaborate with audit process
- Implement Board objectives

MC Responsibilities
- Advise CIO/DCIO and business group heads on management authority
- Provide a forum for in-person cross-team communication
- Review and attribute monthly performance reporting
- Monitor risk exposures
- Discuss market performance and future expectations
- Track and report trust and group priorities
- Coordinate professional development priorities and processes

TRS Accolades
- Top Fund/Top LP
- CIO: Ranked second in the World
- CIO: Two Lifetime Achievement Awards
- Chief Risk Officer: Top ranked in US
- Best Investors under Forty: Two
- 144 Full Time Employees
- 13 years of average investment experience
- 84 Masters Degrees
- 47 CFA's
## Contribution Requirements: Last 5 Years

<table>
<thead>
<tr>
<th>Last 5-Years</th>
<th>Median Peer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>9.2%</td>
</tr>
<tr>
<td>Risk</td>
<td>5.9%</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### TRS vs. Peer Average

<table>
<thead>
<tr>
<th>Funded Status</th>
<th>TRS</th>
<th>Peer Average¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>79.7%</td>
<td>74.9%</td>
</tr>
<tr>
<td>2011</td>
<td>82.7%</td>
<td>77.0%</td>
</tr>
</tbody>
</table>

**Contributions**

- **Employer/ Member**
  - 15.4% (~31%)
    - 7.7%/ 7.7% (~20%/~11%)

**Benefits²**

- 52% vs. 82%

**Duration**

- 22.6 Years vs. 13-20 Years

### Notes:

- **Over the past 5-years, TRS delivered Risk-adjusted returns better than 90% of peers**
  - 1.2% above 8.0% target

- **Funded Status fell to 79.7%**

- **Contribution levels and overall benefits are well below the national average**

- **TRS Duration is longer than most peers**

Source: Aon Hewitt, TRS IMD, GRS

1 Funded status Peers include all public plans greater than $20 B. Contribution/Benefit Peers include all Teacher retirement systems that do not make contributions to Social Security.

2 Source: GRS. Reflects Relative Benefit Index, a measure of the value of retirement income provided to a prototypical career employee from retirement until the member no longer receives benefits. An index score indicates a plan provides a benefit with a value equal to the full salary replacement and cost living adjustments consistent with inflation. The impact of social security benefits are included as well, if applicable.
Investment Outlook: Investment Markets Are Fully Valued

US Stock Market
- Current PE Above Average

Interest Rates
- Interest Rates Very Low

US Dollar
- US Dollar Strengthening

Global Central Banks
- Policy Rate
- Easing/Tightening
- Market Expectation for Dec 2017
- USA 0.63% Tightening 1.13%
- Japan -0.05% Easing -0.01%
- Eurozone -0.40% Easing -0.37%
- UK 0.25% Tightening 0.41%

Private Equity
- EBITDA Multiples Near Peak

Real Estate Cap Rates
- Cap Rates are at their lows

Energy Markets
- Oil Prices crashed in 2015, but strengthened

VIX Volatility Index
- VIX Index low

Source: Bloomberg, Townsend, S&P Capital Group, TRS IMD
Blank Canvas Report: Projected Intermediate Term Returns Have Fallen

Blank Canvas Expected Return Review (Beta)

<table>
<thead>
<tr>
<th>Category</th>
<th>Blank Canvas Expected Return Review (Beta)</th>
<th>Blank Canvas Expected Return Review (Alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>5.1%</td>
<td>2.0%</td>
</tr>
<tr>
<td>EAFE</td>
<td>5.3%</td>
<td>2.0%</td>
</tr>
<tr>
<td>EM</td>
<td>5.3%</td>
<td>2.0%</td>
</tr>
<tr>
<td>PE</td>
<td>6.5%</td>
<td>4.8%</td>
</tr>
<tr>
<td>DHF</td>
<td>3.3%</td>
<td>5.0%</td>
</tr>
<tr>
<td>LT Bonds</td>
<td>2.7%</td>
<td>5.0%</td>
</tr>
<tr>
<td>SVHF</td>
<td>1.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Cash</td>
<td>0.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>TIPS</td>
<td>1.7%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>4.2%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>5.8%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Energy</td>
<td>5.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Illiquid Credit</td>
<td>4.8%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Risk Parity</td>
<td>3.2%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Source: TRS IMD
Next 5-Year Projected Returns from Blank Canvas Study

- Total Stable Value: 2.3%
- Total Global Equity: 6.6%
- Total Real Return: 6.1%
- Total Risk Parity: 5.9%

Source: TRS IMD
Top Priorities

**Beta Management**
- Reduce Deflation Hedge
- Re-Allocate Currency Risk
- Evaluate Use of Leverage
- Prepare for Cycle Transition

**Alpha Production**
- Global Equity Best Practices Transition
- Hedge Funds Fee Modification 70/30 Gross Alpha Split
- Rebalance Hedge Fund Strategy

**Absolute Returns**
- Illiquid Credit
- Evaluate Internal TAA
- Expand Alternative Risk Premia Overlay

**Private Markets**
- Determine Conservative Baselines
- Increase Energy Exposure
- Improved Access to GP’s and Allocations
- Better Fee Structure (70% Alpha)

**CIO Issues**
- Modify Organization
- Evaluate Global Footprint
- Executive Management Growth
- Career Ladder
- Compensation Alignment

**James**

**Jase**

**Mohan**

**Eric**

**Jerry**
TRS IMD: Calculating Funded Status

Funded Ratio¹: 79.7% (Plan Assets / Projected Benefit Obligation)
Funding Period: 36 years (Est. Time to Pay Down Unfunded Liability)

Liabilities²
- Current (4.6% Growth Last 5-Years)
- Projected (4.2% Growth)

Assets³
- Current (Last 5-Years: 3.8%)
- Projected (4.9% Growth)

Contributions⁴
- Current (15.4% Total)
- Projected (15.4%)

FY 2018/19 - Texas Budget⁵

<table>
<thead>
<tr>
<th></th>
<th>State</th>
<th>Federal/ Other</th>
<th>Total - Biennium</th>
<th>Total - Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>$110.6 B</td>
<td></td>
<td>$213.6 B</td>
<td>$106.7 B</td>
</tr>
<tr>
<td>Federal/ Other</td>
<td>$103.0 B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total - Biennium</td>
<td></td>
<td></td>
<td>$213.6 B</td>
<td>$106.7 B</td>
</tr>
</tbody>
</table>

Annual TRS Pension System

<table>
<thead>
<tr>
<th></th>
<th>State</th>
<th>Districts</th>
<th>Members</th>
<th>Trust⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dollars</td>
<td>$2.0 B</td>
<td>$1.4 B</td>
<td>$3.3 B</td>
<td>$150 M</td>
</tr>
<tr>
<td>% of Budget</td>
<td>1.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: GRS, TRS IMD
¹ The Funded Ratio is a measure of Plan Assets relative to the Projected Benefit Obligation at a point in time. If Projected Contributions are included in this calculation, it goes up to 99.3%.
² Current number includes changes in mortality assumptions made in 2015
³ Asset growth rate reflects Fund Investment Returns (+) Contributions (-) Payouts
⁴ Contributions expressed as a percent of Payroll
⁵ Total budget reflects proposal in Senate Bill 1 for the next biennium. State line includes General Revenue and GR-Dedicated line-items.
⁶ TRS Trust operating budget is paid out of the Trust Fund and is not a state expense.
TAB 15C
Moving Forward

to Better Serve Our Members

Best Practices Review
Amy Barrett, Carolina de Onís, Sylvia Bell
## Roles and Functions

### Long-Term Investment Results

<table>
<thead>
<tr>
<th>Effective Governance Framework</th>
<th>Professional Investment Management</th>
<th>Excellent Legal/Operational Infrastructure</th>
<th>Consistent Fair Independent Review</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trustees</strong></td>
<td><strong>IMD</strong></td>
<td><strong>Legal</strong></td>
<td><strong>Audit</strong></td>
</tr>
<tr>
<td>Standards, Oversight, and Delegation</td>
<td>Execution</td>
<td>Compliance with Legal Requirements</td>
<td>Post-investment Assurance</td>
</tr>
</tbody>
</table>

### Process / Performance / Communication / Resources
Governance Structure

**Board of Trustees**
Nine Members Appointed for Six-Year Terms

**Board Advisory Committees**
- Audit
- Benefits
- Budgets
- Compensation
- Ethics
- Investment Management
- Policy
- Risk Management

**Internal Investment Committee (IIC)**
Nine Senior Members of Investment Division + Executive Director

**Standardized Regular Reporting Process with monthly reporting**

**Management Committee (MC)**
Twelve Senior Members of Investment Division

**Board Responsibilities**
- Establish long-term asset allocation policy
- Approve long-term return targets and risk parameters
- Provide appropriate resources, incentives and establish approved processes
- Establish appropriate reporting standards and metrics
- Comply with relevant laws
- Assure professional audit systems
- Approve budget

**IMD Responsibilities**
- Implement investment policies within approved guidelines
- Maximize effectiveness of resources provided
- Deliver Transparent Reporting
- Comply with relevant laws
- Collaborate with audit process
- Implement Board objectives

**MC Responsibilities**
- Advise CIO/DCIO and business group heads on management authority
- Provide a forum for in-person cross-team communication
- Review and attribute monthly performance reporting
- Monitor risk exposures
- Discuss market performance and future expectations
- Track and report Trust and group priorities
- Coordinate professional development priorities and processes
### Operational Infrastructure

**Data**
- Secure, Verified
- Comprehensive and Accessible
- Investment Information

**Legal**
- 8 Investment In-house Counsel
- 7 External Counsel firms
- Strive for market-leading terms

**Compliance**
- Integrated Pre and Post Trade Compliance Processes

**Settlement**
- 99.6% Trade Settlement Accuracy on all Cash and Derivative Markets

**Custodian**
- Dedicated Team of 35+ from State Street

**Valuation**
- Multi-Level Pricing Hierarchy - Daily Audits

**Technology: Automation, Alerts and Continual Process Improvements**
Consistent/Fair Independent Review

- More than 70 audits reports over the last 5 years covering all major functions of IMD
- No Significant Findings

<table>
<thead>
<tr>
<th>Function</th>
<th># of Audits</th>
<th>Auditors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>22</td>
<td>SAO, Comptroller, Internal</td>
</tr>
<tr>
<td>Performance</td>
<td>7</td>
<td>SAO, Internal</td>
</tr>
<tr>
<td>Policy</td>
<td>25</td>
<td>SAO, Internal</td>
</tr>
<tr>
<td>Risk Management</td>
<td>3</td>
<td>Internal</td>
</tr>
<tr>
<td>Trading</td>
<td>3</td>
<td>Internal</td>
</tr>
<tr>
<td>Legislative Authority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Derivatives</td>
<td>3</td>
<td>Internal</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>2</td>
<td>Internal</td>
</tr>
<tr>
<td>External Management</td>
<td>10</td>
<td>Grant Thornton, Internal</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>
Independent Opinions

AON during 2016 IPS Review:
• “Importantly, we also think the current policy reflects best practices. As an appendix to this memorandum, we have included a list of items we think are indicative of best practices for investment policy, and TRS covers these well.”

Reinhart Boerner Van Deuren during 2016 IPS Review:
• “At the conclusion of this process, the Board will have followed a well-documented, prudent review process, resulting in these IMD recommended changes. Overall, the Board will have demonstrated positive fiduciary oversight of the IPS revisions.”

Funston during Fiduciary Audit of Real Assets:
• “In our experience, it is a leading practice for public pension boards to delegate external investment manager selection, as well as authority to manage selected internal investment portfolios, to an appropriately skilled and resourced investment staff.”
TAB 15D
Moving Forward
to Better Serve Our Members

Blank Canvas
Mike Pia, Director, Strategic Partnerships & Research
• Utilize all six strategic partners to develop a better guide for the future.

• **Objective**: Diverse partner views may provide IMD new opportunities, areas of improvement, and further research projects.

• **“Force Multiplier”:** Blank Canvas project put this concept to work.
### Request
- Updated asset class expected returns and asset allocation
- Optimal structure to execute the plan
- Identify organizational considerations
- Unique ideas to support mission to achieve 8% return

### Partner Research & Approach
- “With limited constraints, how would you manage $130 billion?”
  - Mean variance optimization
  - Factor based breakdown of assets and portfolio construction
  - Yield-based
  - Private market / illiquidity tilts

### Post-Project
- Four interdisciplinary IMD teams
- Develop independent assessments of “best-in-class” ideas from partners
  - “Verdicts” function as new guideposts for 2017 actions and beyond
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All major markets are fairly valued
- Bonds: +1.8%
- Equity: +6.2%
- Private RE: +6.6%
- Private Equity: +8.6%

Potential Opportunities
- Energy
- Illiquid Credit

Potential shift into a reflationary biased regime
Illiquid assets continue to provide adequate source of active return, while public asset opportunities are more limited.

Distinctions made between outsourcing, packaging, and manufacturing:

- **Outsourcing**: delegation to external firms
- **Packaging**: internal management of strategies, factors
- **Manufacturing**: internal asset management and trading
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This slide was intentionally left blank.
This slide was intentionally left blank.
• Issue four independent assessments and “verdicts” of partner solutions
  o Trust-wide, interdisciplinary teams
  o Efficient decision making and collaborative environment, seeking common end-goal
  o Reviewed return assumptions, allocations, and unique ideas from partner Blank Canvas reports
  o “Verdict” asset class expected returns more conservative than partner projections
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This slide was intentionally left blank.
Accomplished:

✓ Utilized network of “best and brightest” from our strategic partners.

✓ Summarized recommendations and extracted best ideas from all presentations.

✓ Collaborated internally and provided implementable solutions.

✓ Created next steps.

2017 Top Five Priority Projects:

☐ Beta Management

☐ Alpha Production

☐ Focus Transition

☐ Private Markets

☐ CIO Issues
Moving Forward
to Better Serve Our Members

TRS Competitive Advantages
Katy Hoffman, Senior Director, Chief of Staff
Mohan Balachandran, Senior Managing Director Asset Allocation
I. TRS Competitive Advantages

II. Strategic Relationships

III. Principal Investing

IV. TRS Dislocation Strategy

V. Developing New Internal Strategies

VI. Recruit and Retain Top Investor Talent

VII. World Class Agency Structure
TRS IMD’s Competitive Advantages

- **Large:** $133 billion
  - Up $52 billion over last 5 years
  - 14th largest pension fund in the World
  - 2nd largest return seeking enterprise in Texas

- **Long-Term:** 20+ Year Time Horizon

- **Liquid:** $50 billion in “Stressed Market Scenario”

- **Not Significantly Levered:** Prudent and Controlled

Unique Characteristics of TRS

Strategic Relationships

- Performance
- Resources
- Insight
- Access
- Efficiency
- Research

<table>
<thead>
<tr>
<th>Public</th>
<th>Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BlackRock</td>
<td>$1.7 billion</td>
</tr>
<tr>
<td>2. JP Morgan</td>
<td>1.8 billion</td>
</tr>
<tr>
<td>3. Morgan Stanley</td>
<td>1.7 billion</td>
</tr>
<tr>
<td>4. Neuberger Berman</td>
<td>1.7 billion</td>
</tr>
<tr>
<td>Total</td>
<td>$6.9 billion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Private</th>
<th>Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apollo</td>
<td>$1.5 billion</td>
</tr>
<tr>
<td>2. KKR</td>
<td>1.7 billion</td>
</tr>
<tr>
<td>Total</td>
<td>$3.2 billion</td>
</tr>
</tbody>
</table>

Total of 48 High Quality Research Projects for TRS

- TRS is a Top Five Relationship with 95 Firms Globally

Proprietary Research | Total
---|---
1. Investment Models | 9
2. Valuation Frameworks | 14
3. Risk Management | 16
4. Investment Strategies | 9

Source: State Street Bank and TRS IMD as of 9/30/2016. Private Markets Strategic commitments total $6.6B out of the $8B allocated. SPN Tactical Value NAV $664mm and commitments of $2B
Principal Investment Program

- $8.5 billion in Principal Investments (61 Investments)
- Added significant value to the Trust: 16% annualized return and nearly $4 billion of investment return
- Texas Way Valuation process used to standardized and speed execution
- Our ability to act, our size and our professionals made this possible

<table>
<thead>
<tr>
<th></th>
<th>Private Equity</th>
<th>Real Assets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>25</td>
<td>36</td>
<td>61</td>
</tr>
<tr>
<td>Commitment ($,B)</td>
<td>$ 4.265</td>
<td>$ 9.620</td>
<td>$ 13.885</td>
</tr>
<tr>
<td>NAV ($,B)</td>
<td>$ 2.966</td>
<td>$ 5.485</td>
<td>$ 8.451</td>
</tr>
<tr>
<td>5 Year IRR</td>
<td>17.4%</td>
<td>15.0%</td>
<td>15.7%</td>
</tr>
<tr>
<td>Median Peer</td>
<td>9.6%</td>
<td>11.3%</td>
<td>10.8%</td>
</tr>
<tr>
<td>Value Added</td>
<td>7.7%</td>
<td>3.7%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Dollars Earned ($,B)</td>
<td>$ 1.230</td>
<td>$ 2.563</td>
<td>$ 3.793</td>
</tr>
<tr>
<td>Value Added ($,mm)</td>
<td>$ 394.6</td>
<td>$ 454.4</td>
<td>$ 848.9</td>
</tr>
</tbody>
</table>

Unique Investment Capabilities of TRS

Source: State Street Bank, TRS IMD and TUCS as of 9/30/2016. Median Peer Total represents a weighted average based on TRS allocation
Note: Principal Investments are either commitments to a single investment and/or a single LP structure.
TRS Dislocation Strategy

• Cross functional group at IMD assembled to evaluate markets answering two questions:
  - Does it play to TRS key strength; Large, Long-term, Liquid and unlevered?
  - Does it move the needle?

• Develop Investment strategy with multiple entry triggers

• Strategy typically has four phases:
  - Identification – 80% probability of desired return in next 3 years
  - “Small boats” – Typically early, picking the bottom of the market very difficult
  - “Large boats” – Clarity and experience established & significant testing for 8% minimum return
  - Predetermined exit strategy

Unique Ability to Capture Value in Dislocations
Dislocations

- Evaluated multiple dislocations
- 80% probability of desired return in next 3 years
- TRS process produced high teens returns and a profit exceeding $1 billion at very low risk

Source: State Street Bank, TRS IMD and Bloomberg
## IMD Evaluation Process

### Research and Development of New Investment Concepts and Strategies

<table>
<thead>
<tr>
<th>Investment Concept</th>
<th>“Paper” Portfolio</th>
<th>“Research” Portfolio</th>
<th>Long-Term Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Role in Trust</td>
<td>• Six Months</td>
<td>• Six Months</td>
<td>• Beyond one year</td>
</tr>
<tr>
<td>• Type of Strategy</td>
<td>• Operations oversight o No assets o Trade entry o Position reporting</td>
<td>• Operations oversight o Assets &lt;= $100 million o Trade entry o Position reporting</td>
<td>• Metrics satisfied</td>
</tr>
<tr>
<td>• Investment Process</td>
<td>• Performance reporting through State Street Systems</td>
<td>• Performance reporting through State Street Systems</td>
<td>• Role in Trust established</td>
</tr>
<tr>
<td>• Policy Compliance</td>
<td>• Monthly Report to Management Committee</td>
<td>• Monthly Report to Management Committee</td>
<td>• Direct assignments made</td>
</tr>
<tr>
<td>• Sponsor from Management Committee</td>
<td>• Transparency Report</td>
<td>• Transparency Report</td>
<td>• All previous oversight and reporting continued</td>
</tr>
<tr>
<td>• Success Metrics</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Management Committee Review</th>
<th>IIC Approval/Disapproval</th>
<th>IIC Approval/Disapproval</th>
<th>Established Internal Strategy</th>
</tr>
</thead>
</table>

- Board Transparency provided continually throughout the process

## Unique Research and Development at TRS
Research & Development

- TRS has a formal process for researching and developing new investment strategies
- Currently running nearly $7 billion in new strategies developed in the last five years
- All above benchmark since inception

<table>
<thead>
<tr>
<th>Strategy Name</th>
<th>Market Value ($,000)</th>
<th>3 Year Return</th>
<th>3 Year Excess Return</th>
<th>Estimated Annual Cost Savings ($,m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Volatility</td>
<td>$775,486</td>
<td>16.8%</td>
<td>5.5%</td>
<td>3.1</td>
</tr>
<tr>
<td>US High Quality Equity</td>
<td>99,108</td>
<td>14.1%</td>
<td>3.1%</td>
<td>0.4</td>
</tr>
<tr>
<td>Internal Risk Parity</td>
<td>3,217,282</td>
<td>7.7%</td>
<td>4.2%</td>
<td>11.3</td>
</tr>
<tr>
<td>Precious Metals (aka “Gold”)</td>
<td>242,999</td>
<td>7.2%</td>
<td>29.3%</td>
<td>1.0</td>
</tr>
<tr>
<td>Quantitative Equity</td>
<td>2,648,432</td>
<td>5.8%</td>
<td>0.4%</td>
<td>5.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$6,983,308</strong></td>
<td><strong>6.4%</strong></td>
<td><strong>2.5%</strong></td>
<td><strong>21.1</strong></td>
</tr>
</tbody>
</table>

Source: State Street Bank as of 9/30/2016. Estimated Annual Cost Savings is a per annum IMD Calculation: Low Vol, US High Quality, Precious Metals 40bps; Internal Risk Parity 35bps, Quantitative Equity 20bps.
# Recruit and Retain Top Investor Talent

## Awards & Credentials
- CIO: Ranked second in the World (Two Lifetime Achievement Awards)
- Chief Risk Officer: Top ranked in US
- Best Investors under Forty: Two
- 144 Full Time Employees with 13 years of average investment experience
- 84 Masters Degrees
- 47 CFA’s

## Investment
- Character
- Culture
- Commitment
- Compensation

---

**Unique Investment Team and Culture**
World Class Agency Structure

Board of Trustees
Nine Members Appointed for Six-Year Terms
Board Advisory Committees

- Audit
- Benefits
- Budgets
- Compensation
- Ethics
- Investment Management
- Policy
- Risk Management

Internal Investment Committee (IIC)
Nine Senior Members of Investment Division + Executive Director

- CIO
- Deputy CIO
- Asset Allocation
- Operations
- External Private Markets
- Trading
- Internal Investment Management
- External Public Markets
- Risk Management
- Executive Director (non-voting, veto power)

Standardized Regular Reporting Process with monthly reporting

Management Committee (MC)
Twelve Senior Members of Investment Division

- CIO
- Deputy CIO
- COS
- Operations
- Asset Allocation
- Trading
- Internal Investment Management
- External Public Markets
- Risk Management
- External Private Markets
- Strategic Partnership Research
- General Counsel
- Professional Development (Observer)

Board Responsibilities
- Establish long-term asset allocation policy
- Approve long-term return targets and risk parameters
- Provide appropriate resources, incentives and establish approved processes
- Establish appropriate reporting standards and metrics
- Comply with relevant laws
- Assure professional audit systems
- Approve budget

IMD Responsibilities
- Implement investment policies within approved guidelines
- Maximize effectiveness of resources provided
- Deliver Transparent Reporting
- Comply with relevant laws
- Collaborate with audit process
- Implement Board objectives

MC Responsibilities
- Advise CIO/DCIO and business group heads on management authority
- Provide a forum for in-person cross-team communication
- Review and attribute monthly performance reporting
- Monitor risk exposures
- Discuss market performance and future expectations
- Track and report Trust and group priorities
- Coordinate professional development priorities and processes
Moving Forward
to Better Serve Our Members

Optimize TRS IMD Public Equity Portfolio
Jase Auby, Chi Kit Chai, Dale West
I. Executive Summary and Introduction
II. Project plan
III. Enhanced external manager compensation structure
IV. Summary of initial conclusions
V. Appendix
Executive Summary

As of September 30, 2016, the TRS global public equity portfolio consists of:

- $52.4 billion of assets (39% of the Trust) with 5Y return of 10.5% and 5Y alpha of +21 bp

In 2016, a group of senior leaders of the IMD led a project to:

1. Determine how we can better use and optimize our current public equity alpha streams
2. Review new potential investing strategies
3. Develop recommendations for consideration by the CIO and DCIO

Key initial conclusions

1. Manage the global public equity portfolio as one integrated portfolio
2. Better optimize current TRS beta and alpha streams
3. Enhance active / passive mix
4. Create an enhanced compensation structure for external relationships

Source: State Street, total global public equity excludes SPW public equity, Directional Hedge Funds, and TAA
Introduction

The project team’s six members represent all of the Trust’s public equity portfolios

Jase Auby, CFA
Senior Managing Director
Chief Risk Officer
BS, Harvard College
Project Team Leader

Chi Kit Chai, CFA
Senior Managing Director
Internal Public Markets
MBA, Southern Methodist
MA, Univ. of Texas
BA, Virginia Tech

Dale West, CFA
Senior Managing Director
External Public Markets
MBA, Stanford University
BS, Univ. of Texas

Mark Albert, CFA
Senior Director
Asset Allocation
MBA, Univ. of Michigan
BS, Brandeis University

Katy Hoffman
Senior Director
Chief of Staff to CIO
MBA, Vanderbilt University
BA, Trinity University

Mike Pia, CFA, CAIA
Director
Strategic Partnerships & Research
MBA, Texas Christian Univ.
BS, U.S. Naval Academy

The team developed a three phase project plan

1. June 2016
   - Review best practices
   - Review all current IMD alpha streams
   - Develop database / metrics for evaluation

2. December
   - Identify optimal alpha stream contributions
   - Eliminate redundant, unproductive streams
   - Create optimal single integrated strategy

3. June 2017
   - Initiative implementation
   - Transition plan over time
The global public equity portfolio is comprised of six sub-portfolios

- IPM Core and EPU are the bulk of the assets – 89% of total public equity portfolio
- Quant, Low Volatility, Quality and Passive are newer, smaller portfolios – 11% of the total public equity portfolio

For the total portfolio, five year return is **10.5%** and excess return is **+21 bp**

### TOTAL PUBLIC EQUITY PORTFOLIO

<table>
<thead>
<tr>
<th></th>
<th>Total Assets</th>
<th>5 Year Annualized Return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$, billion</td>
<td>% Pub Eq</td>
</tr>
<tr>
<td>IPM Core</td>
<td>$20.2</td>
<td>38.5%</td>
</tr>
<tr>
<td>EPU</td>
<td>26.3</td>
<td>50.1</td>
</tr>
<tr>
<td>Quant</td>
<td>2.6</td>
<td>5.1</td>
</tr>
<tr>
<td>Low Volatility</td>
<td>0.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Quality</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Passive</td>
<td>2.5</td>
<td>4.7</td>
</tr>
<tr>
<td>Total</td>
<td>$52.4</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: State Street. As of September 30, 2016. Low Volatility return is for a period shorter than five years (inception date is 1/1/2013).
## Introduction

**Global public equity portfolio today and 5 years ago**

### The portfolio today and 5 years ago

- The number of alpha streams has increased from 34 to 44
- An alpha stream is the excess return of a portfolio versus its benchmark

### Performance

<table>
<thead>
<tr>
<th></th>
<th>5 Year Return</th>
<th>5 Year Excess (bp)</th>
<th>No. of Alpha Streams</th>
<th>% of Assets – Today</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10.1%</td>
<td>+5</td>
<td>34</td>
<td>50.1%</td>
</tr>
<tr>
<td></td>
<td>11.0%</td>
<td>+4</td>
<td>3</td>
<td>38.5%</td>
</tr>
<tr>
<td></td>
<td>12.5%</td>
<td>+155</td>
<td>3</td>
<td>5.1%</td>
</tr>
<tr>
<td></td>
<td>18.8%</td>
<td>+433</td>
<td>3</td>
<td>1.5%</td>
</tr>
<tr>
<td></td>
<td>17.5%</td>
<td>+118</td>
<td>1</td>
<td>0.2%</td>
</tr>
<tr>
<td></td>
<td>10.5%</td>
<td></td>
<td>1</td>
<td>4.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100.0%</td>
</tr>
</tbody>
</table>

### Assets

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>EAFE+C</th>
<th>EM</th>
<th>World</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets – Today</strong></td>
<td>$6.2</td>
<td>$10.5</td>
<td>$1.4</td>
<td>6.1</td>
<td>$20.6</td>
</tr>
<tr>
<td>USA</td>
<td>$5.6</td>
<td>7.0</td>
<td>0.9</td>
<td>6.1</td>
<td>13.9</td>
</tr>
<tr>
<td>EAFE+C</td>
<td>8.4</td>
<td>2.7</td>
<td>0.3</td>
<td></td>
<td>11.8</td>
</tr>
<tr>
<td>EM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td>World</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$26.3</td>
<td>$20.2</td>
<td>$2.6</td>
<td>$0.1</td>
<td>$2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>EAFE+C</th>
<th>EM</th>
<th>World</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets – 5 Years Ago</strong></td>
<td>$7.9</td>
<td>$7.4</td>
<td>$0.1</td>
<td>3.2</td>
<td>$17.4</td>
</tr>
<tr>
<td>USA</td>
<td>3.7</td>
<td>6.4</td>
<td>0.1</td>
<td>3.2</td>
<td>13.4</td>
</tr>
<tr>
<td>EAFE+C</td>
<td>5.6</td>
<td>2.8</td>
<td></td>
<td>3.2</td>
<td>8.7</td>
</tr>
<tr>
<td>EM</td>
<td></td>
<td></td>
<td></td>
<td>3.2</td>
<td>0.3</td>
</tr>
<tr>
<td>World</td>
<td></td>
<td></td>
<td></td>
<td>3.2</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$20.4</td>
<td>$16.6</td>
<td>$0.2</td>
<td></td>
<td>$5.4</td>
</tr>
</tbody>
</table>

### No. of Alpha Streams

<table>
<thead>
<tr>
<th></th>
<th>Today</th>
<th>5 Years Ago</th>
<th>% of Assets – Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Streams</td>
<td>34</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>% of Assets</td>
<td>50.1%</td>
<td>38.5%</td>
<td>34</td>
</tr>
</tbody>
</table>

*Source: State Street. As of September 30, 2016. Low Volatility return is for a period shorter than five years (inception date is 1/1/2013).*
Project plan

Project research questions

• Can we combine alpha streams to:
  o Optimize returns
  o Optimize expenses
  o Control risks
  o Add more value

• Can we identify and eliminate alpha streams that are:
  o Redundant
  o Ineffective
  o Unaligned with respect to compensation
  o Unable to scale

• Can we optimize remaining alpha streams with an emphasis on:
  o Producing a single integrated strategy
  o Long term reliability
  o Understandable diversification expectations
  o Diversified production processes / styles
  o Costs versus benefits
Project plan
Project research questions (cont’d)

- How many viable alpha streams do we have?

<table>
<thead>
<tr>
<th>Current alpha streams</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamental Core</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Fundamental Value</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Fundamental Growth</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Fundamental Activism</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fundamental Macro / cycle</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Quant Factor</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Quant Timing/Idiosyncratic</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Quant Alpha capture</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>34</td>
</tr>
</tbody>
</table>

- How have our alpha streams performed?

<table>
<thead>
<tr>
<th>5 year alpha</th>
<th>Total</th>
<th>USA</th>
<th>EAFE+C</th>
<th>EM</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPM Core</td>
<td>+4</td>
<td>-126</td>
<td>+134</td>
<td>+264</td>
<td></td>
</tr>
<tr>
<td>EPU</td>
<td>+5</td>
<td>-138</td>
<td>+128</td>
<td>+90</td>
<td>+12</td>
</tr>
<tr>
<td>Quant</td>
<td>+155</td>
<td>+204</td>
<td>+144</td>
<td>+131</td>
<td></td>
</tr>
<tr>
<td>Low Vol 1</td>
<td>+433</td>
<td>+429</td>
<td>+162</td>
<td>+125</td>
<td></td>
</tr>
<tr>
<td>Quality USA</td>
<td>+118</td>
<td>+118</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>+21</td>
<td>-117</td>
<td>+138</td>
<td>+151</td>
<td></td>
</tr>
</tbody>
</table>

Note: For the year 2016, EPU USA had alpha of +202 bp and returned 14.7%

- How have we performed under different market regimes (value, momentum, quality/defensive)?

<table>
<thead>
<tr>
<th>bp</th>
<th>5 Year Annualized Alpha</th>
<th>Positive Value 39/60</th>
<th>Negative Value 21/60</th>
<th>Positive Momentum 42/60</th>
<th>Negative Momentum 18/60</th>
<th>Positive Quality/Defensive 34/60</th>
<th>Negative Quality/Defensive 26/60</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPM Core</td>
<td>+4</td>
<td>-7</td>
<td>+11</td>
<td>+25</td>
<td>-21</td>
<td>-33</td>
<td>+37</td>
</tr>
<tr>
<td>EPU</td>
<td>+5</td>
<td>-29</td>
<td>+34</td>
<td>-42</td>
<td>+47</td>
<td>-119</td>
<td>+124</td>
</tr>
<tr>
<td>Quant</td>
<td>+155</td>
<td>+103</td>
<td>+52</td>
<td>+91</td>
<td>+64</td>
<td>+58</td>
<td>+97</td>
</tr>
<tr>
<td>LowVol 1</td>
<td>+433</td>
<td>+140</td>
<td>+293</td>
<td>+699</td>
<td>-266</td>
<td>+740</td>
<td>-307</td>
</tr>
<tr>
<td>Quality USA</td>
<td>+118</td>
<td>-52</td>
<td>+170</td>
<td>+353</td>
<td>-235</td>
<td>+420</td>
<td>-302</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>-11</td>
<td>32</td>
<td>25</td>
<td>-4</td>
<td>-26</td>
<td>47</td>
</tr>
</tbody>
</table>

Example: When value stocks outperformed (39 of 60 months), IPM Core underperformed by -7 bp. Similarly, when value underperformed (21 of 60 months), IPM Core outperformed by +11 bp.
Project plan

Project research questions (cont’d)

• How has performance by region (USA, EAFE+C and Emerging Markets) contributed to the Total?

• Alphas are cyclical

• Favorable factors can include:
  o Value
  o Momentum
  o Quality / Defensive

• Some constraints are:
  o AUM too large
  o Portfolio structure
  o Fees
  o Transaction costs

-150  -100  -50   0     +50    +100   +150  +200  +250

2013  2014  2015  2016

Rolling 5Y Alpha

-150 -100 -50  0 +50 +100 +150 +200 +250

2013 2014 2015 2016

Historical degree of difficulty

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EM</td>
<td>Less hard</td>
</tr>
<tr>
<td>EAFE+C</td>
<td>Hard</td>
</tr>
<tr>
<td>USA</td>
<td>Hardest</td>
</tr>
</tbody>
</table>

Source: State Street, as of September 30, 2016
• Long term alpha cycles -- how have our TUCS peers performed?
Project plan

Project research questions (cont’d)

• What have we done so far?
  - Research of Global Best Practices
  - Internal database of alphas and risk exposures
  - Review of current alpha streams
  - Cross Functional Leadership Team

• What remains to be done?
  o Identify combination of current alphas which are
    ▪ Individually productive but reside within one integrated portfolio
    ▪ Understandable diversification sources
    ▪ Properly weighted/scaled
    ▪ Unique
  o Develop transition plan
    ▪ Describe time horizon to implement and check-in points
    ▪ Key metrics – alpha, tracking error, market regime performance, factor exposures, valuation

Source: State Street, as of September 30, 2016
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Enhanced Compensation Structure
1 or 30 fee external manager structure

- **Key Partner Endorsements**
  - Albourne
  - BlackRock

- **Future communication efforts**
  - Present the structure at 4 large industry events over the next six months

- **Industry Articles**

<table>
<thead>
<tr>
<th>Publication</th>
<th>Article or quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional Investor</td>
<td>“Could this be the holy grail of hedge fund fees?”</td>
</tr>
<tr>
<td>Pensions &amp; Investments</td>
<td>“Texas fund taking bold steps on fees”</td>
</tr>
<tr>
<td>HFM Week</td>
<td>“Texas Teacher RS plans '1 or 30' structure”</td>
</tr>
<tr>
<td>Bloomberg</td>
<td>“Globally, at least two dozen ‘well-known’ managers with institutional investors have either adopted or are working on a so-called ‘1-or-30’ fee model”</td>
</tr>
</tbody>
</table>
Summary of initial conclusions

Initial conclusions are in four key categories:

1. **One integrated portfolio**
   - Implement any changes to the portfolio over time with an orderly transition and rigorous review as research and development and other transition milestones are reached

2. **Better optimize current TRS beta and alpha streams**

3. **Enhance active / passive mix**
   - Timing of any change subject to current macro conditions

4. **Install an enhanced compensation structure for external relationships**
   - Implement and communicate 70/30 fee structure

*Source: TRS IMD*
APPENDIX
The newer portfolios typically use “quantitative investing”. Quantitative investing is one of the two main styles of investing:

- **Fundamental** – picking individual stocks and group allocations
- **Quantitative** – designing and monitoring rules for a computer to systematically execute

<table>
<thead>
<tr>
<th>Fundamental Research</th>
<th>Quantitative Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on human experience, envisions a future different from the past</td>
<td>Based on objective rules, envisions a future based on the past</td>
</tr>
<tr>
<td>Understands the power of exceptions</td>
<td>Understands the power of averages</td>
</tr>
<tr>
<td>Applies deep and broad knowledge to a narrower opportunity set</td>
<td>Applies narrow set of quantitative insights to a broader opportunity set</td>
</tr>
</tbody>
</table>

At TRS, we invest using both styles in both our internal and external portfolios.

Traditionally, more of the TRS internal portfolio was fundamental research, however, recent research and development has focused on quantitative methods.

Source: Adapted from Macquarie
Equity factor investing

- Many styles of Quantitative Investment make use of “Equity Factors”

- There are many different types of equity factors. This chart shows a few examples.
  - Blue are the returns from factors with an expected long term positive return from an overweight
  - Green are the returns from factors with more indeterminate return from an overweight

<table>
<thead>
<tr>
<th>Equity Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
</tr>
<tr>
<td>Momentum</td>
</tr>
<tr>
<td>Quality</td>
</tr>
<tr>
<td>Defensive</td>
</tr>
<tr>
<td>Growth</td>
</tr>
<tr>
<td>Mid Capitalization</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td>Long-Term Reversal</td>
</tr>
<tr>
<td>Liquidity</td>
</tr>
</tbody>
</table>

Source: Barra equity factor model
Equity factor investing (cont’d)

- Theories of why a positive premium from certain equity factors exists

<table>
<thead>
<tr>
<th>Factor</th>
<th>Possible Fundamental Explanation</th>
<th>Possible Behavioral Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>High sensitivity to economic shocks in bad times</td>
<td>Overreaction to bad news and extrapolation of the recent past leads to sustained underpricing</td>
</tr>
<tr>
<td>Momentum</td>
<td>None</td>
<td>Investor overconfidence, self-attribution bias and recency bias leads to returns continuation in the short term</td>
</tr>
<tr>
<td>Quality</td>
<td>Firms facing high cost of capital or otherwise maintaining profitability discipline will invest only in the most profitable projects</td>
<td>Investors do not care about high and low profitability in growth firms</td>
</tr>
<tr>
<td>Defensive</td>
<td>Most investors are constrained from using leverage in their portfolio and are limited to purchasing high risk stocks when they wish to expand risk</td>
<td>Investors are drawn to firms with more interesting stories and higher variation of possible outcomes</td>
</tr>
<tr>
<td>Volatility Selling</td>
<td>Substantial tail risks</td>
<td>Investor risk aversion causes them to overpay for insurance against tail events</td>
</tr>
<tr>
<td>Size</td>
<td>Low liquidity, high distress and downside risk is compensated by higher returns</td>
<td>Limited investor attention to smaller cap stocks</td>
</tr>
</tbody>
</table>

Source: EDHEC-Risk as revised by TRS
**Equity factor investing (cont’d)**

A few of our pension fund peers have invested either internally or externally in quantitative portfolios

<table>
<thead>
<tr>
<th>Fund</th>
<th>AUM</th>
<th>Country</th>
<th>Media Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway Oil Fund</td>
<td>$884 B</td>
<td>Norway</td>
<td>“Harvest[ing] systematic risk premiums is an integral part of NBIM’s management mission.” [Value, Small]</td>
</tr>
<tr>
<td>APG / ABP</td>
<td>$419 B</td>
<td>Netherlands</td>
<td>Have allocated ~EUR40 billion to portfolios benchmarked to smart beta. In addition, has tilted 50-60% of developed equities to factors. [Value, Momentum, Quality, Defensive, RAFI]</td>
</tr>
<tr>
<td>PGGM / PfZW</td>
<td>$215 B</td>
<td>Netherlands</td>
<td>“40% of equity holdings to three factor premiums: value, low-volatility and quality.” [Value, Quality, Defensive]</td>
</tr>
<tr>
<td>ATP</td>
<td>$122 B</td>
<td>Denmark</td>
<td>15% of risk allocated to “alternative risk premia.”</td>
</tr>
<tr>
<td>PKA</td>
<td>$28 B</td>
<td>Denmark</td>
<td>“Portfolio targets alternative beta, including dividends, implied volatility, merger arbitrage, value, and liquidity event risk premiums.” [Value, Defensive, Liquidity]</td>
</tr>
<tr>
<td>AIMco</td>
<td>$80 B</td>
<td>Canada</td>
<td>“We’ve been doing this for many years and have built models that emphasize value, momentum and quality” [Value, Momentum, Quality]</td>
</tr>
<tr>
<td>AP2</td>
<td>$35 B</td>
<td>Sweden</td>
<td>“AP2, the state pension fund in Sweden that oversees $35 billion, tried smart beta in 2002 through an equal-weighted portfolio of Swedish stocks, followed in 2006 by investments in a RAFI index...now, 50 percent of the fund’s equities are in the strategies” [RAFI]</td>
</tr>
<tr>
<td>Calpers</td>
<td>$297 B</td>
<td>US</td>
<td>“$28 billion allocated to smart beta” – via internally managed RAFI. Also, has started to invest in factors such as LowVol and Momentum. [RAFI, Momentum, Defensive]</td>
</tr>
</tbody>
</table>

Source: Various media sources
Recent USA alpha experience

• To help explain recent USA alpha experience, we constructed a “Generic USA Manager”:
  o 27% US Small, 20% US Growth, 7% US Value, 4% EAFE, 3% Cash, 39% Passive

• We then compared our “Generic USA Manager” to the TUCS median alpha for USA portfolios:

• USA Managers tend to outperform their benchmarks when:
  1. US Small, US Growth and US Value outperform
  2. EAFE outperforms
  3. Cash outperforms

Source: TUCS, MSCI index data, TRS calculations. Generic USA Manager created by a regression of TUCS alpha to MSCI indices.
TAB 15G
Moving Forward to Better Serve Our Members

Top 5 Priorities for 2017
Jerry Albright, Deputy Chief Investment Officer
• In 2007, Texas Statue and TRS Investment Policy were changed to allow the Trust, through 2019, to use:
  o **External Managers up to 30% of Trust assets under agency agreements.**
    ▪ **Result:** $1.1 billion added value in active management.
  o **Hedge Funds up to 10% of Trust**
    ▪ Increased return with minimal increase in Trust risk.
    ▪ **Result:** $500 million in valued added.
  o **Derivatives**
    ▪ Common practice in investment management.
    ▪ **Result:** Reduced cost and better risk management.

• Our authority has been audited extensively, internally and externally since 2010 with no significant findings

• Request elimination of the 2019 Sunset for derivatives and external managers

• Request elimination of Cap on external management
## London Office Update

**Opened in November 2015**

### First Year

- TRICOT has exceeded their goal for increased deal flow
  - 66 potential investments ($7.5 billion)
    - 21 Private
    - 41 RE
    - 4 Other
  - Geographic dispersion of deals reviewed
    - 51% Europe
    - 43% UK
  - TRICOT closed 3 deals total of $400 million and a projected fee savings of $9 million
- General Partner Tours were conducted with over 50 firms in the UK
- Enhanced information flow around significant market events such as Brexit
- TRICOT has exported its “Texas Way” to London

### This Years Goals

- Continue executing on current plan
- Targeted European Partner’s meetings (France, Germany)
- Enhance expertise with a Real Assets professional
- Determine appropriate deal size for London office opportunities
### Top Priorities

<table>
<thead>
<tr>
<th>Beta Management</th>
<th>Alpha Production</th>
<th>Absolute Returns</th>
<th>Private Markets</th>
<th>CIO Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reduce Deflation Hedge</td>
<td>- Global Equity Best Practices Transition</td>
<td>- Illiquid Credit</td>
<td>- Determine Conservative Baselines</td>
<td>- Modify Organization</td>
</tr>
<tr>
<td></td>
<td>- Re-Allocate Currency Risk</td>
<td>- Evaluate Internal TAA</td>
<td>- Increase Energy Exposure</td>
<td>- Evaluate Global Footprint</td>
</tr>
<tr>
<td></td>
<td>- Evaluate Use of Leverage</td>
<td>- Hedge Funds Fee Modification 70/30 Gross Alpha Split</td>
<td>- Expand Alternative Risk Premia Overlay</td>
<td>- Executive Management Growth</td>
</tr>
<tr>
<td></td>
<td>- Prepare for Cycle Transition</td>
<td>- Rebalance Hedge Fund Strategy</td>
<td>- Improved Access to GP’s and Allocations</td>
<td>- Improved Access to GP’s and Allocations</td>
</tr>
<tr>
<td>James</td>
<td>Jase</td>
<td>Mohan</td>
<td>Eric</td>
<td>Jerry</td>
</tr>
</tbody>
</table>

- Mohan is responsible for evaluating the use of leverage and preparing for cycle transition.

- Eric is responsible for hedge fund strategy and fee modification.

- Jase is responsible for global equity best practices transition and hedge fund fee modification.

- James is responsible for reduce deflation hedge, re-allocate currency risk, evaluate use of leverage, and prepare for cycle transition.

- Jerry is responsible for modify organization, evaluate global footprint, executive management growth, and compensation alignment.
TAB 15H
Moving Forward

to Better Serve Our Members

Emerging Manager Program Overview

Sylvia Bell, Managing Director
I. Overview

II. Organizational Structure

III. Assets, Relationship and Performance

IV. Capital Plan

V. Commitment to Small and Diverse Managers

VI. Program Accomplishments and Priorities
Overview

Established in 2005

• Celebrating 11-year anniversary
• In top five Emerging Manager Programs in the US
• $4.7 billion in emerging manager commitments since inception
  o $2.9 billion in committed capital to 151 managers, including graduates
  o $1.8 billion invested with EM graduates at Trust-level (averaging over $360 million each)
• Emerging Managers are firms with less than $2 billion AUM
  o Minority or Woman Owned is defined as 1/3 ownership by a woman, minority, disabled or veteran
  o Typical first commitment between $10 million to $20 million
  o Follow-on commitments are between $20 million to $50 million

Broader Emerging Manager Structure in the World

• Asset Classes: Private Equity, Real Estate, Public Equity and Hedge Funds
• Performance: 9.8%; above benchmark (three years through 9/30/16)
• Key criteria for transitioning to the larger trust: growth of firm AUM, operational infrastructure, Trust alignment and manager performance

<table>
<thead>
<tr>
<th>Graduated EM Managers</th>
<th>Asset Class</th>
<th>Firm AUM ($ in billions)</th>
<th>Initial Commitment ($ in millions)</th>
<th>Current Commitment ($ in millions)</th>
<th>Total TRS Commitments ($ in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crestview</td>
<td>Private Equity</td>
<td>$7.0</td>
<td>$7</td>
<td>$427</td>
<td>$434</td>
</tr>
<tr>
<td>Roark</td>
<td>Private Equity</td>
<td>$5.5</td>
<td>$14</td>
<td>$200</td>
<td>$214</td>
</tr>
<tr>
<td>Vista</td>
<td>Private Equity</td>
<td>$19.0</td>
<td>$15</td>
<td>$400</td>
<td>$415</td>
</tr>
<tr>
<td>Wayzata</td>
<td>Private Equity</td>
<td>$7.3</td>
<td>$12</td>
<td>$350</td>
<td>$362</td>
</tr>
<tr>
<td>Divco West</td>
<td>Real Estate</td>
<td>$3.4</td>
<td>$15</td>
<td>$450</td>
<td>$465</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$63</strong></td>
<td><strong>$1,827</strong></td>
<td><strong>$1,890</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: TRS IMD as of 12/31/2016
Organizational Structure

OPERATIONS

LeAnn Gola  
Senior Associate, CPA  
MBA, Texas State University

ADVISORS

Afsaneh Beschloss  
President and CEO  
The Rock Creek Group

Sylvia Bell  
Managing Director, CPA  
MS, University of Florida

INVESTMENTS

Edgar Mayorga  
Analyst  
BA, UT Austin

Peter Braffman  
Managing Director  
GCM Grosvenor
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Commitment to Small and Diverse Managers

TRS Annual Emerging Manager Conference

- TRS hosts an annual conference in Austin, Texas dedicated to Emerging Managers, welcoming stakeholders from across the country
- Attendees include: pensions, endowments, insurance companies, family offices, fund of funds, and emerging managers of all asset classes and strategy types

Emerging Manager Capital Commitments

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian American</td>
<td>21%</td>
</tr>
<tr>
<td>Hispanic American</td>
<td>24%</td>
</tr>
<tr>
<td>African American</td>
<td>38%</td>
</tr>
<tr>
<td>Woman</td>
<td>17%</td>
</tr>
<tr>
<td>MWOB</td>
<td>44%</td>
</tr>
<tr>
<td>Non-MWOB</td>
<td>56%</td>
</tr>
</tbody>
</table>

Source: TRS IMD and State Street Bank as of 9/30/2016

Conference Attendance by Year

- 2012: 115
- 2013: 370
- 2014: 500
- 2015: 730
- 2016: 1025
- 2017: 1340

Jan-12 Jan-13 Jan-14 Jan-15 Jan-16 Jan-17
Program Accomplishments and Priorities

### 2016 Accomplishments

- Consolidated Program under GCM Grosvenor and Rock Creek Group
  - Optimized Program Roles and Responsibilities
  - Effective control of capital allocation
- Achieved Capital Plan goals
  - Deployed $465 million to qualified emerging managers
- Outperformed Total Program benchmark, net of all fees
  - Added alpha of 90 basis points on 1-year basis
  - Added alpha of 30 basis points on 3-year basis
- Hosted preeminent Emerging Manager Conference with record attendance of over 1,000 people

### 2017 Priorities

- Deliver net alpha utilizing qualified emerging managers across all asset classes
- Integrate dedicated on-site GCM investment associate to TRS Emerging Manager team
- Effectively allocate approved EM capital as requested by the TRS Trustees
- Identify and grow the next generation of investors for the Trust
- **Primary Focus:** Additional funding to successful EM’s in current portfolio

Source: State Street Bank; Performance as of 9/30/2016, Commitments as of 12/31/2016
TAB 16
EVALUATION OF THE INVESTMENT PRACTICES AND PERFORMANCE AT THE TEACHER RETIREMENT SYSTEM OF TEXAS:

AN ASSESSMENT OF THE TRS REAL ASSETS INVESTMENT PROGRAM

FEBRUARY 23, 2017 TRS BOARD OF TRUSTEES PRESENTATION
INTRODUCTIONS

Presentation Team:

• **Randy Miller** – Principal with Funston Advisory Services (FAS) and project manager

• **Keith Bozarth** – Senior Advisor on the FAS team and and former Executive Director of the State of Wisconsin Investment Board (SWIB) and Orange County Employees Retirement System

• **Chris Tehranian** – Principal with Meketa Investment Group (MIG) in the firm’s Private Markets Group and Head of Infrastructure Research

• **Christy Gahr** – Senior Vice President with MIG who focuses on real estate and private equity

Other Core Team Members:

• **Lisa Bacon** – Senior Vice President with MIG in the Private Markets Group, previously Real Return Investment Analyst for the New Mexico State Investment Council (NMSIC)

• **Chris Waddell** – Senior Attorney with Olson Hagel & Fishburn, LLP, previously General Counsel for California State Teachers’ Retirement System (CalSTRS) and the San Diego City Employees’ Retirement System (SDCERS)
OUTLINE

• Background of Review
• Summary of Findings
• Recommendations for Improvement
  – Governance
  – Real Assets Policies and Strategies
  – Real Assets Processes
BACKGROUND OF REVIEW

• Conducted on behalf of the State Auditor’s Office (SAO) by Funston Advisory Services with assistance from Meketa Investment Group.
• Directed to focus specifically on the effectiveness of the Real Assets (RA) investment program:
  – TRS’s goals and objectives in real assets
  – Adequacy of the Board’s policies governing real assets.
  – Effectiveness of TRS’s investments in real assets.
  – Adequacy of TRS’s identification of risks related to the real assets program.
  – Compliance with laws, regulations, and investment policies.
  – TRS’s current structure for investing in real asset investments.
  – Real asset investment strategies currently not employed by TRS.
  – Adequacy of the level of information TRS receives.
  – Adequacy of the reporting of investing activities/results of TRS’s investments in real assets to executive management and the Board.
  – Potential opportunities for improving TRS’s policies, procedures, and practices for investing in real assets.
SUMMARY OF FINDINGS

- TRS utilizes leading or prevailing policies and practices in all areas we assessed.
- Real Assets program goals and objectives appear to be appropriate.
- The Board’s policies governing Real Assets are adequate.
- TRS has been meeting its Real Assets goals and objectives.
- TRS has a leading practice investment risk management program and tools and is effectively managing risk in Real Assets.
- We identified no instances of Real Assets non-compliance with laws, regulations or policies.
- TRS is utilizing the investing structures it is authorized to employ effectively and taking advantage of cost-effective vehicles such as co-investing, sidecars and other principal investing structures.
- The information which TRS receives from its General Partners (GPs) is appropriate and adequate.
- Real Assets reporting to executive management and the Board is appropriate and adequate.
RECOMMENDATIONS FOR IMPROVEMENT

**Governance:**

1. The TRS Board should **consider enhancing the monitoring and oversight of annual commitments through two actions:**
   - The TRS staff should provide the Board the annual capital plan for the Real Assets portfolio as soon as it is final each year and include an update on the capital plan with each quarterly Transparency Report; and,
   - TRS should include in Appendix B of the IPS a limit on the total Real Assets commitments that can be made in a single year.

2. The Board should consider adopting a stand-alone Compliance Policy in order to place Board emphasis on the importance of compliance and greater clarity to the respective roles and responsibilities throughout TRS respecting this area.
RECOMMENDATIONS FOR IMPROVEMENT

Governance (continued):

3. The TRS Board should consider several options to improve reporting and coordination of compliance and other oversight activities:
   • Consider whether the ability to use and comprehend the various investment information from all sources provided to trustees would be enhanced by developing a map, or guide, to the various sources and their purpose as a part of trustee training or in a manual.
   • Although overall reporting is robust, TRS may benefit by shifting more regular reporting responsibilities to the Chief Compliance Officer and moving the Chief Audit Executive towards the role of assessing the effectiveness of the compliance function.
   • Specific to investment compliance, map the responsibilities and functions of the responsible areas to provide a system-wide view of investment compliance activities and enhance TRS’ already strong investment compliance efforts.

4. The TRS Board should consider adopting a stated limit to the use of leverage rather than rely on the set of guidelines developed by the Real Assets team.
RECOMMENDATIONS FOR IMPROVEMENT

Real Assets Policies and Strategies:

5. The TRS Board should consider, for clarity and completeness, a reference to inflation protection or hedging in the Investment Policy Statement.

6. TRS should consider implementing improvements to the Real Assets benchmark to better match the current portfolio construction with regard to risk through one of two options:
   • Formally adopt the NCREIF ODCE plus premium percentage approach that would reflect TRS Real Assets strategy and portfolio construction.
   • Adopt a blended real assets benchmark given the global nature of the program, exposure to non-core real estate, and the allocation beyond traditional property types.

7. TRS should continue to explore the potential benefits of foreign currency hedging and consider hedging its foreign currency exposure in Real Assets.
RECOMMENDATIONS FOR IMPROVEMENT

Real Assets Policies and Strategies (continued):

8. TRS should consider whether additional mechanisms are necessary to support graduating Emerging Manager funds from that program to the Real Assets Premier List.

9. In consideration of the higher returns achieved, the Principal Investing (PI) program should be expanded, as already contemplated by staff.

10. The PI program, or other approach, should be used as needed to “wrap” managers with multiple investments to replicate aspects of the Strategic Partner Network (SPN) and secure the best possible terms and deal flow (i.e., to gain benefits similar to strategic partners with those managers).

11. Real Assets should undertake a cost/benefit analysis of the potential for active direct real estate investing.
RECOMMENDATIONS FOR IMPROVEMENT

Real Assets Processes:

12. TRS should consider greater standardization of data collection and templates to improve efficiency.

13. A plan to selectively conduct targeted fee audits should be developed and implemented on a partial-portfolio rolling basis.

14. Valuation audits could be performed on rolling basis, and/or independent valuations could be required/requested for selected investments.

15. Expanding written guidelines to address selected portfolio review and diligence activities should be considered.
CONCLUSIONS AND NEXT STEPS

• Overall, the Real Assets program is sound and TRS utilizes many leading practices.
• The recommendations in our report should enhance those leading practices already in place.
• TRS staff have indicated their support for the recommendations and have been very constructive in working with our team.
• TRS staff will be able to implement some of the recommendations without Board involvement.
• The TRS Board should expect further discussions over the next 24 months regarding many of the recommendations.
Moving Forward

to Better Serve Our Members

IMD Review of the Funston Report
Eric Lang and Grant Walker
Overall Assessment: TRS utilizes leading or prevailing policies and practices in all areas assessed by Funston.

<table>
<thead>
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<th>BOARD</th>
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<td>• Increase Principal Investing</td>
<td>At next IPS Review:</td>
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<tr>
<td>• Attempt to replicate Strategic Partner structure in additional relationships</td>
<td>• Consider reference to inflation protection / hedging</td>
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<tr>
<td>• Complete an analysis of the cost/benefit of direct real estate investing</td>
<td>• Consider a stand-alone compliance policy</td>
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<tr>
<td>• Research alternatives to address foreign currency fluctuations</td>
<td>• Research market for improved benchmarks</td>
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<td>• Consider limitations on leverage and annual commitments</td>
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Evaluation of the Investment Practices and Performance at the Teacher Retirement System of Texas

Final Report

Submitted: December 21, 2016
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Executive Summary

Context

The scope of this review, conducted on behalf of the State Auditor’s Office (SAO), was directed to specifically focus on the effectiveness of the Real Assets (RA) investment program at the Teacher Retirement System of Texas (TRS). However, most aspects of investment oversight and management are common for the entire trust fund portfolio: the overall governance framework for the Board of Trustees and TRS and its Investment Management Division (IMD); the investment policies; investment reporting and oversight; risk management; organizational checks and balances; and independent oversight. As a result, the Funston Advisory Services LLC (FAS) team also reviewed all of these areas and assessed their effectiveness in the context of the Real Assets program.

Overview of Findings

We found TRS to utilize leading or prevailing policies and practices in all areas we assessed. While we did identify a number of opportunities for improvement which are included later in this report, we did not find any areas of significant concern.

In summary, we found the TRS Real Assets program goals and objectives to be appropriate and the Board’s policies governing Real Assets to be adequate. TRS has been meeting its Real Assets goals and objectives. TRS has a leading practice investment risk management program and tools and is effectively managing risk in Real Assets. We identified no instances of Real Assets non-compliance with laws, regulations or policies.

TRS is currently utilizing the investing structures it is authorized to employ effectively and taking advantage of cost-effective vehicles such as co-investing, sidecars and other principal investing structures. The one investment approach that TRS does not currently use in Real Assets, internally managed investment in Real Assets through securities issued by TRS-controlled title-holding entities (hereafter, “direct investing” or “direct real estate investment”), is not authorized by TRS’ current governing laws. If TRS were to be allowed to engage in such direct investing, it would require legislative action, significantly more internal resources, and a business plan to guide its development.

The information which TRS receives from its General Partners (GPs) is appropriate and adequate, as is Real Assets reporting to executive management and the Board.

Real Assets Strategies and Goals

Overall, the TRS Real Assets program goals and objectives are generally appropriate. In terms of investment scope, the Real Assets program is now only focused on Real Estate, but the Trust has exposure to Infrastructure, Energy and Natural Resources through a separate but dedicated allocation. The permitted Real Estate sectors and strategies outlined in the Investment Policy Statement (IPS) appear to be robust.
The TRS Real Assets program has a specific objective in the IPS to provide the Trust diversification through both low correlations to other asset classes and by portfolio construction. This objective is in line with other large institutional investors and with TRS’ current portfolio.

TRS has a stated Real Assets objective to provide competitive returns through capital appreciation and alpha generation (i.e., excess returns relative to a passive benchmark). This objective is in line with other large institutional investors and with the current TRS portfolio.

The Real Assets program makes up the largest allocation to the Trust’s Real Return strategy (TRS breaks down their investment strategies into three groupings for diversification purposes: Stable Value; Global Equity; and Real Return). The Real Return strategy includes Energy, Natural Resources, Infrastructure, and Inflation-Linked Bonds and is meant to provide positive performance for the Trust during an inflationary period. This objective is in line with other large institutional investors and with the current TRS portfolio.

The Real Assets program has a target allocation of 14% which is consistent with other large institutional investors. Additionally, TRS is expected to reach this target by 2018 based on current investment pacing and expected capital deployment.

The Real Assets program currently utilizes the NCREIF ODCE (National Council of Real Estate Investment Fiduciaries – Open-End Diversified Core Equity) index for a benchmark and has an alpha target maximum of 1.25% above the index for incentive compensation calculation purposes. A NCREIF ODCE + premium percentage would be a suitable approach that would reflect TRS Real Asset strategy and portfolio construction. Although this would not be an investable index, it is a suitable approach due to the relative lack of generally accepted, robust, or transparent Real Estate benchmarks currently available that would directly reflect TRS’ investment strategy. The Real Assets staff is working with other providers, such as the Investment Property Databank (IPD), to help provide a more accurate benchmark, but likely that is not a near-term option.

TRS makes Real Assets investments in multiple modes, with significant capital deployed through partnership arrangements that provide lower fees, better governance, and greater opportunities to earn alpha than relying only on commingled funds would provide. One-third of the program’s exposure is through modes other than standard commingled funds, under “Principal Investments”. TRS also makes significant use of principal (with manager), co-investment, single LP, and sidecar modes.

TRS does not significantly rely on secondaries or funds of funds in Real Assets, which is consistent with TRS’s status as a sophisticated, large, well-resourced investor.

TRS does not currently make real estate investments without a manager, as it is not authorized to do so under its governing statutes.

IMD Policies and Processes Related to Real Assets

The primary expression of policy by the TRS Board is through its IPS. Within the IPS and its appendices, the following are pertinent to the Real Assets portfolio:

- Fund level and Real Assets objectives;
• General Private Market portfolio (of which RA is a part) criteria and processes;
• Authorized RA investments and restrictions;
• General investment processes for RA;
• Allocation target and ranges for RA;
• Risk management factors and general approaches;
• Ethics issues – in particular, political contributions, improper influence, placement agents and finders; and,
• Measurement and reporting criteria.

In reviewing the specifics of each of these areas, we noted no material deficiencies. One item that may be further clarified is a more detailed definition of the objectives for real assets.

TRS appropriately seeks to operate an investment program that meets the standards of the best institutional investors. Providing adequate resources for such an operation is difficult in a governmental setting, particularly in the context of staff size, qualifications and compensation.

In our view, providing a governing board with full budget authority is the optimum governance structure. However, the budget for TRS is a part of the state legislative process, and placing the right emphasis and focus on resources, including staff resources, is a critical part of the Board’s job. The Board has adopted policy provisions aimed at that task.

The IPS itself requires at least annual reporting of staffing to the Board, keeping the Board in an informed position. The IPS also authorizes staff to acquire consulting resources where beneficial to augment staff resources, providing needed flexibility.

In its Bylaws, the Board has established standing committees for budget and for staff compensation. Part of the mandate for the Compensation Committee is to help maintain the performance incentive pay plan, an important tool in staffing an institutional quality investment program.

Taken together, these policies provide the needed awareness and Board priority for addressing resource needs. Based upon our interviews, and comparing to other large public pension funds, we believe the TRS Real Assets program is appropriately resourced for its current investment program.

TRS’s Real Assets program is well-designed to forge strong relationships with best-in-class managers and drive deal flow to co-investments and other modal opportunities with lower fees and tactical attractions. We consider the policies and processes to be leading practice among large institutional investors.

For example, under the Premier List system, manager due diligence is conducted and managers are certified at least six months in advance of recommending any investment with them. Staff review the Premier List twice a year to reconfirm or revise status. Per Executive/Senior Management direction, the practice is to keep the total number roughly the same, so adding a new manager or general partner (GP) requires removing another from the list.
Medal colors – platinum (Strategic Partner Network (SPN) managers), gold, silver, and bronze — further segment managers, largely based on future expected deal flow to future commitments, including principal and co-investments. This system focuses staff and consultant time and attention on the most important relationships, and provides a strong signal to managers about TRS’s status as a source of significant and potentially recurring capital.

Planning, sourcing, diligence, approval, execution, monitoring, and reporting processes and requirements are documented, in the form of procedures and guidelines. The written guidelines represent a comprehensive combination of narrative, checklists, flow charts, and other templates to support work flow and decision-making.

Risk-related items, including policy requirements, are considered from the early stage of an opportunity and evaluated explicitly during due diligence. These benefit from the Chief Risk Officer sitting on the Internal Investment Committee. Process outputs are tracked for completion, conformance, and electronically filed according to convention. Sample work products reflect rigorous and thoughtful analysis, presented at both a summary and detailed level.

Communication within the Real Assets team appears frequent and well-functioning. The investment review and decision-making activities occurring at the Pre-Internal Investment Committee and full Internal Investment Committee meetings include the appropriate professionals and diligence documentation to support collective deliberations and investment recommendations.

All staff we interviewed understood the process and were fluent and accurate in describing the steps and associated activities with excellent consistency.

At a macro and micro level, the investment processes effectively implement the “Texas Way,” which is articulated in policy.

From a manager monitoring perspective, reporting by investment managers meets, and in some aspects, exceeds industry standards. Managers submit the required information in a timely manner in their regular format, with submissions going directly to TRS, the custodian bank, and the Real Assets consultant. The regular and supplemental reporting provides information at the fund-level and property-level, including valuations and fees.

TRS documents reporting requirements in Side Letter conditions that memorialize (create a record of) reporting covered in partnership terms and impose additional specific and broad requirements, addressing items such as reporting deadlines, asset and fund level information, and data formats.

Individually and collectively, TRS, the custodian bank, and the RA consultant systems are comprehensive, at or above industry standard, and sufficiently redundant and workflows are sound and well documented.

TRS, the custodian bank, and real assets consultant each have appropriate QA/QC (Quality Assurance/Quality Control) processes and procedures, with multiple layers of approval for all contributions and distributions. Systems and workflows internally at TRS and at the custodian bank provide appropriate back-up and allow data to be reconciled easily, with the custodian bank holding the investment book of record.

Finally, TRS plans to continue advocacy/participation in industry efforts toward standardization and
Real Assets Performance

Overall, the TRS Real Assets program is meeting its goals and objectives. Current correlation across public markets is relatively low. The actual experience of the Trust has been lower than projected by the Risk Management Group and is generally low on an absolute basis.

The Real Assets portfolio’s total gross time-weighted return over the five-year period is 14.2%, comprised of 4.6% income and 9.3% appreciation. The experience across sub-sectors was consistent and appropriate for each strategy’s expected return drivers. It is likely that the removal of infrastructure from the Real Assets portfolio will enhance the portfolio’s appreciation return at the expense of income production.

The Trust is well-diversified according to IPS’ stated metrics. Strategy exposure is robust and appropriate and well-diversified across the U.S. on both an absolute and relative basis compared to the NCREIF ODCE benchmark. As a portion of market, the Real Assets ex-U.S. exposure is 13%, split across Europe (7%), Asia (4%), and Latin America (2%).

Real Assets Risk Management and Compliance

TRS’ identification and monitoring of key risks within the Real Assets program appear adequate. As mentioned, the Real Assets program is well-diversified by geographic region, strategy type, and sector. Currency exposure appears appropriate for a US dollar-denominated plan. While the Trust has experienced foreign exchange losses, for a plan of its size, global diversification is appropriate and the level of participation is reasonable.

Currently, TRS has an overweight to “Other” real estate. While some of the specialty real estate investments offer defensive characteristics, they also may be susceptible to operating risk (i.e., risk of loss resulting from inadequate or failed internal processes, people and systems or from external events.) Operating Risk in the Real Assets program is likely to fall with the removal of Infrastructure.

The Real Assets program previously was managed to an alpha target of 2.5% above the program’s benchmark, the NCREIF ODCE, for incentive compensation calculation purposes. The reduction of this maximum alpha target to 1.25% is viewed favorably and should better align the risk profile of the Real Assets program with the stated benchmark.

The Real Assets team, alongside the Risk Management Group, completes a joint risk assessment on principal investments/co-investments. Risk categories include: strategy type, manager experience, geographic diversification, industry diversification, regulatory, accounting, tax and legal, leverage, Investment Management Division’s experience with the manager, “Texas Way” criteria, and the size of the investment.

As it relates to asset allocation limits, the Real Assets team develops an annual capital plan to generate forward commitments for the program. The capital plan is completed with the guidance of the Asset Allocation group.

Finally, development exposure is likely contained to Opportunistic investments and the sub-sector’s
risk/return profile captures this level of risk. The current allocation to Opportunistic is 28%, which falls within a reasonable allocation range.

The Chief Compliance Officer (CCO) has overall responsibility for investment compliance monitoring, hiring external parties to assist with investment compliance monitoring, if necessary, and presenting investment compliance reviews on a quarterly basis to the TRS Board. In the aggregate, the TRS Board has budgeted sufficient resources for the investment compliance function, and there appears to be strong “top-down” support for investment compliance throughout the organization.

All facets of compliance with laws and policy relating to the Real Assets portfolio are being addressed by TRS senior management, although there is an opportunity to provide greater clarity with respect to the allocation of compliance responsibilities within senior management. In addition, compliance activities with respect to the Real Assets portfolio are regularly reported to the TRS Board through its committees by senior management and internal audits and overall reporting is robust.

Summary of Opportunities for Improvement

Although we did not find any areas of significant concern and did conclude that TRS utilizes leading or prevailing policies and practices in all areas we assessed, we did identify a number of opportunities for improvement as described in the summary below. We have organized the recommendations thematically in the areas of: 1) Governance; 2) Real Assets Policies and Strategies; and, 3) Real Assets Processes, and listed the recommendation reference number from the main body of the report.

Governance:

1. **The TRS Board should consider establishing annual limits on the size of commitments to work in conjunction with existing deal-level limits through two actions:**

   - (R2.2) The TRS staff should provide the Board the annual capital plan for the Real Assets portfolio as soon as it is final each year and include an update on the capital plan with each quarterly Transparency Report; and,
   - (R2.3) TRS should include in Appendix B of the IPS a limit on the total Real Assets commitments that can be made in a single year.

   **TRS Response:** TRS agrees. We propose to provide the Board the final Annual Capital Plan at the start of the calendar year and update the Board through quarterly Transparency Reports. Implementation date for this information is by June 30, 2017. TRS agrees to discuss the limits on the size of total Real Assets commitments that can be made in a single year during the next IPS review period September 2018. The Board currently limits our latitude here with 5% bands around the target allocation on Real Assets as well as overall Trust tracking error and VAR limits.

2. **(R5.1) The Board should consider adopting a stand-alone Compliance Policy in order to place Board emphasis on the importance of compliance and greater clarity to the respective roles and responsibilities throughout TRS respecting this area.**
TRS Response: TRS agrees to review and discuss this suggestion with the Board. A stand-alone Compliance Policy could be potentially redundant, excessive and misplaced when considered with TRS’ existing policies. Alternatively, TRS may recommend the creation of a Compliance Charter that addresses TRS Compliance broadly, not solely investment compliance. Similar to the Audit Charter, a TRS Compliance Charter could be adopted by the Board. Implementation date for providing a recommendation to the Board evaluating adoption of a stand-alone Compliance Policy is December 31, 2017.

3. The TRS Board should consider several options to improve reporting and coordination of compliance and other oversight activities:

   • (R9.1) Consider whether the ability to use and comprehend the various investment information from all sources provided to trustees would be enhanced by developing a map, or guide, to the various sources and their purpose as a part of trustee training or in a manual.

   TRS Response: TRS agrees. We are already addressing the compliance mapping issue as part of a presentation for the Board. Whether fully incorporated into the Board presentation or not, a detailed map could serve as a resource for multiple purposes including a TRS Compliance Charter. Implementation date for an initial compliance map is May 2017.

   • (R5.3) Although overall reporting is robust, TRS may benefit by shifting more regular reporting responsibilities to the Chief Compliance Officer and moving the Chief Audit Executive towards the role of assessing the effectiveness of the compliance function.

   TRS Response: TRS agrees to review and discuss this suggestion with the Board. Shifting certain compliance reporting responsibilities to the CCO may better centralize the investment compliance function consistent with IPS requirements. Such a shift is embodied in the proposed renaming of the Board’s Audit Committee to the Audit and Compliance Committee and the creation of a regular reporting item for the CCO to the Committee. In addition, Internal Audit and Risk Management have suggested that existing reports related to investment compliance violations could be shifted to the CCO for reporting to the Board. Implementation date for officially shifting certain reporting responsibilities is next revision of relevant committee by-laws.

   • (R5.2) Specific to investment compliance, map the responsibilities and functions of the responsible areas to provide a system-wide view of investment compliance activities and enhance TRS’ already strong investment compliance efforts.

   TRS Response: TRS agrees. See response to R9.1 above.

4. (R4.1) The TRS Board should consider adopting a stated limit to the use of leverage rather than rely on the set of guidelines developed by the Real Assets team.

   TRS Response: TRS agrees to review and discuss this suggestion with the Board. We will review this recommendation with our consultants and provide a recommendation to the Board during the next IPS review period September 2018.
Real Assets Policies and Strategies:

5. **(R2.1)** The TRS Board should consider, for clarity and completeness, a reference to inflation protection or hedging in the Investment Policy Statement.

   **TRS Response:** TRS agrees to review and discuss this suggestion with the Board. We will review this recommendation with our consultants and provide a recommendation to the Board during the next IPS review period September 2018.

6. **TRS should consider implementing improvements to the Real Assets benchmark to better match the current portfolio construction with regard to risk through one of two options:**

   - (R1.2) Formally adopt the NCREIF ODCE plus premium percentage approach that would reflect TRS Real Asset strategy and portfolio construction.
   - (R3.1) Adopt a blended real assets benchmark given the global nature of the program and exposure to non-core real estate and the allocation to various property types.

   **TRS Response:** TRS agrees to further evaluate the current Real Assets benchmark and make recommendations for a modification if it is determined that an alternate benchmark structure is appropriate during the next IPS review period September 2018.

7. **(R4.2)** TRS should continue to explore the potential benefits of foreign currency hedging and consider hedging its foreign currency exposure in Real Assets.

   **TRS Response:** TRS agrees. We already have a Research Dynamic Hedging practice in place and are targeting to have a currency hedging recommendation for Private Markets by June 30, 2017.

8. **(R6.4)** TRS should consider whether additional mechanisms are necessary to support graduating Emerging Manager funds from that program to the Real Assets Premier List.

   **TRS Response:** TRS agrees. To date, the Program has already graduated 5 EM managers who have received over $1.8 billion of Trust level allocation. In addition, IMD conducts a Bi-Annual Portfolio Review with the TRS Private Market teams and EM Program consultants to identify and target EM managers that would make good “Trust level” candidates. Decisions are based on EM managers’ exceptional performance and Trust level strategy fit. Finally, TRS Private Market portfolio managers in conjunction with the EM program director approve all EM program investments. We believe our current process is highly effective in meeting EM program goals. We will continue to evaluate whether additional mechanisms are necessary to support graduating Emerging Manager funds to the Real Assets Premier List.

9. **(R6.2)** In consideration of the higher returns achieved, the Principal Investing (PI) program should be expanded, as already contemplated by staff.
TRS Review of Real Assets Investment Practices and Performance
Final Report

TRS Response: TRS agrees. We will continue to focus existing resources on Principal Investing and consider the need for any additional resources as we evaluate the potential for a larger percentage allocation to Principal Investing in the 2017 Capital Plan. Implementation by March 2017.

10. (R6.3) The PI program, or other approach, should be used as needed to “wrap” managers with multiple investments to replicate aspects of the Strategic Partner Network (SPN) and secure the best possible terms and deal flow (i.e., to gain benefits similar to strategic partners with those managers).

   TRS Response: TRS agrees. We are researching this and evaluating proposals for such “key” relationships with a target implementation by December 2017.

11. (R7.1) Real Assets should undertake a cost/benefit analysis of the potential for active direct real estate investing.

   TRS Response: TRS agrees. We will have internal discussions with key stakeholders by December 2017 to determine the next course of action.

Real Assets Processes:

12. (R8.1) TRS should consider greater standardization of data collection and templates to improve efficiency.

   TRS Response: TRS agrees. We have begun implementing this process and will continue to refine it over time.

13. (R8.2) A plan to selectively conduct targeted fee audits should be developed and implemented on a partial-portfolio rolling basis.

   TRS Response: TRS agrees. Internal Audit is piloting two private equity fund audits in FY17 that will include fees and valuation practices. Based on the results of those audits and as part of the annual audit planning process, TRS will consider expanding the scope of future audits to include real estate fee audits in FY18. Implementation date for an approved audit plan considering real estate fee audits is 9/30/2017.

14. (R8.3) Valuation audits could be performed on rolling basis, and/or independent valuations could be required/requested for selected investments.

   TRS Response: TRS agrees. As part of the audit planning process for FY18, Internal Audit will consider adding a project to risk assess TRS’s Real Estate portfolio holdings to identify any valuation estimates using significant assumptions where TRS does not receive independent valuations or assurance. We will use the results of this assessment to recommend to management investments that would benefit from third party valuations or assurance in the future. Implementation date for an approved audit plan considering a valuation risk assessment is 9/30/2017.

15. (R6.1) Expanding written guidelines to address selected portfolio review and diligence activities should be considered.
TRS Response: TRS agrees. As Portfolio Review is a fluid discussion, we agree to outline guidelines regarding the general process.
Purpose of the Review

TRS background

The Teacher Retirement System (TRS) was established in 1936 to provide a retirement program for persons employed in public education in professional and business administration, supervision, and instruction. Benefits were later expanded to include disability, death, and survivor benefits. In 1949, membership was expanded to include all employees of public education, and in 1985 the administration of a health insurance program, TRS-Care, for public school retirees, was added. The passage of the Texas Public School Employees Group Insurance Act in 1995 gave additional responsibilities for TRS to administer health insurance program benefits to active school employees, beginning with the 1996-1997 school year.

The assets of the TRS pension fund are required by state and federal law to be held in trust for the exclusive benefit of plan participants and beneficiaries. The Board of Trustees of TRS, the trustee of all plan assets, is responsible for the general administration and operation of TRS, and is authorized by law to adopt rules for the administration of TRS and the transaction of the business of the Board.

TRS has approximately 600 employees and an annual operating budget of $113 million. TRS’s responsibilities include the maintenance of an actuarially sound retirement system and the provision of health insurance services to retirees and active public school employees. To meet these responsibilities, TRS must prudently manage its $126.6 billion (market value) investment portfolio.

The retirement program administered by TRS is a defined benefit plan. As of August 31, 2015, TRS reported 1,459,243 members, which consist of 1,081,505 active members and 377,738 retiree members. For the fiscal year ending August 31, 2015, TRS paid approximately $9.4 billion in retirement benefits.

The Investment Management Division (IMD) of TRS manages the defined benefit trust fund as a balanced and globally diversified portfolio with a long-term strategy which includes risk management, active investing and asset allocation. More than 150 investment professionals within IMD are involved in managing the diverse portfolio.

Requirement for review by State Auditor’s Office

In accordance with Section 825.512 of the Texas Government Code, the Texas State Auditor’s Office sought proposals to evaluate the investment practices and performance at TRS and selected Funston Advisory Services LLC.

Scope of review

The scope of work agreed between Funston Advisory Services (FAS) and the State Auditor’s Office (SAO) included an evaluation of the effectiveness of TRS’s real assets investment program to determine if it is achieving its goals and objectives. FAS was instructed to consider the following:

- Appropriateness of TRS’s goals and objectives of investing in real assets.
• Adequacy of the Board’s policies governing real assets.

• Effectiveness of TRS’s investments in real assets – i.e., whether TRS has been meeting the goals and objectives of the real assets program.

• Adequacy of TRS’s identification of significant risks related to the real assets program.

• Compliance with the requirements of laws, regulations, and investment policies.

• Evaluate TRS’s current structure for investing in real asset investments and compare that structure to other potential investment methods.

• Evaluate real asset investment strategies currently not employed by TRS that could be advantageous for the fund.

• Adequacy of the level of information TRS receives from partnerships, including information on fund, property level details, investment valuations, and fees via the TRS reporting template.

• Adequacy of the reporting of investing activities/results of TRS’s investments in real assets to executive management and the Board.

• Potential opportunities for improving TRS’s policies, procedures, and practices for investing in real assets.
Work Performed

Review process and activities completed

Funston Advisory Services LLC has developed a comprehensive fiduciary and governance review framework and methodology which has been used in similar assignments with other public retirement systems. The FAS framework starts with the overall duties of the fiduciary and conceptually addresses three major questions:

- Are the plan fiduciaries effectively assessing plan liabilities, making reasonable assumptions for investment returns and risk, and adopting prudent investment strategies?
- What is the legal, governance and policy framework under which the plans operate and how does it compare to industry practices?
- How do fund practices, procedures and performance with respect to operations, compliance, and controls compare to peers, taking into consideration its operating framework?

For this assignment to evaluate selected aspects of TRS investment policies, operations, and performance, this methodology was adapted to the scope of the RFP.

The review was conducted in three phases: Data Gathering; Assessment and Analysis; and Final Report.

During the Data Gathering phase, the FAS team reviewed over 200 documents provided in response to an information request. The FAS team also interviewed 20 TRS executives and four trustees, the Board’s financial advisor, as well as two external investment managers, the general and real assets consultants, and the custodian bank.

The Assessment and Analysis phase involved addressing the requirements listed in the nine areas included in the RFP as noted above in the scope. Preliminary findings were discussed with TRS staff and validated or revised based upon feedback and further analysis. An Interim Briefing was conducted in the TRS offices to discuss preliminary observations.

A draft final report was submitted to the SAO and TRS for review and feedback. After discussing the feedback, the FAS team considered it and made edits, as appropriate, and submitted the final report to the SAO. The Legislative Audit Committee will receive the full final report and, if desired, a summary presentation of findings and recommendations.

Project timeframe

The review was initiated in early September 2016 with a document request from FAS to TRS. During the third week of September, the FAS project team was on site in Austin and conducted interviews with TRS staff. The Interim Briefing was conducted in Austin on October 25, 2016. The draft final report was submitted to the SAO on November 22, 2016, and the final report submitted on December 20, 2016.
**Project team**

FAS has conducted a series of similar fiduciary reviews of a number of other U.S. public pension funds over the past six years. The scope of these reviews has varied significantly, but has often included a review of the governance structure and policies, investment operations, risk management policies and practices, compliance, and related policies and practices. On past assignments, members of the FAS team have been governance and operations experts, but not investment advisors, as FAS does not typically provide investment advice.

The required scope of this assignment included a review of specific TRS investment policies, practices and performance in the Real Assets asset class which requires a deep level of investment expertise. As a result, individuals from Meketa Investment Group, Inc. (Meketa) were included as a key part of the FAS team to address these areas.

The FAS project team included the following core team members:

- Lisa Bacon, real assets
- Keith Bozarth, governance
- Christy Gahr, real estate
- Randy Miller, project manager
- Chris Tehranian, investment policy and real assets
- Chris Waddell, compliance

In addition, the following were senior advisors to the team:

- Rick Funston, project leader
- John Haggerty, real assets and private markets
- Jon Lukomnik, governance and investment policy

More detailed biographies of the project team can be found in Appendix 2.
Findings

**Overall TRS Investment Governance**

As with most sophisticated institutional investor organizations, TRS has evolved significantly over the past ten years and continues to mature and adapt to changing conditions. We observed numerous areas where we believe TRS has developed leading practices among U.S. public pension funds in terms of its policies and practices, and we reference those areas throughout our report.

One of the most significant changes TRS implemented for its investment program was the delegation of investment decision-making, within limited investment amounts, to the IMD staff, a policy which was implemented in 2008. In our experience, it is a leading practice for public pension boards to delegate external investment manager selection, as well as authority to manage selected internal investment portfolios, to an appropriately skilled and resourced investment staff. This policy both allows the Board, which has limited time available for oversight of the retirement system, to spend sufficient time on overall investment strategy and other important matters, and moves investment management decision-making responsibility into the hands of full-time investment professionals who have both the skills and time to adequately assess investment opportunities.

The limits which the TRS Board has imposed on investment authority for the Internal Investment Committee (IIC) in the IPS are indicated in the table below:

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>TRS Investment Delegation Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial Allocation or Commitment with Manager Organization, by Portfolio</td>
</tr>
<tr>
<td>External Public Markets Portfolio</td>
<td>0.5%</td>
</tr>
<tr>
<td>Private Equity Portfolio</td>
<td>0.5%</td>
</tr>
<tr>
<td>Real Assets Portfolio</td>
<td>0.5%</td>
</tr>
<tr>
<td>Energy and Natural Resources Portfolio</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>Total IIC Approval Authority, each Manager Organization</strong></td>
<td></td>
</tr>
</tbody>
</table>

Based upon our experience, these limits are typical for a large public fund in the U.S. which has delegated significant authority to investment staff. For example, the California Public Employees’ Retirement System (CalPERS) has the following policy for its delegations in real estate as described in its Statement of Investment Policy for Real Assets dated February 16, 2016:

“Staff is responsible for...Screening, evaluating, and approving investment proposals that meet Real
Estate Delegation Resolution authority ("Delegated Authority") guidelines.

<table>
<thead>
<tr>
<th>CalPERS Real Estate Portfolio Investment Delegation Limits</th>
<th>New Investments or Dispositions</th>
<th>Existing Investments in the Strategic and Legacy Portfolios</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staff Authority Limits</strong></td>
<td><strong>Base Core</strong></td>
<td><strong>Domestic Tactical</strong></td>
</tr>
<tr>
<td>The Managing Investment Director or the Chief Investment Officer may commit the lesser of the indicated percent of the policy target amount or indicated dollar amount per relationship</td>
<td>5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Managing Investment Director</td>
<td>$1.5</td>
<td>$0.75</td>
</tr>
<tr>
<td>Chief Investment Officer</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Annual Limit</td>
<td>25%</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>$7</td>
<td>$2.5</td>
</tr>
</tbody>
</table>

Other large state pension funds allow full delegation to their staff. For example, the following is the real estate investment delegation of the State of Wisconsin Investment Board (SWIB) as described in the Real Estate Equity Portfolio Guidelines contained in their Investment Policy, Objectives and Guidelines dated August 10, 2016:

“Any other guidelines notwithstanding, all portfolio commitments are subject to the following approvals:

<table>
<thead>
<tr>
<th>SWIB Real Estate Investment Delegation Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Managing Director – Private Markets &amp; Funds Alpha</strong></td>
</tr>
<tr>
<td>Commingled Fund</td>
</tr>
<tr>
<td>• New Fund</td>
</tr>
<tr>
<td>• Follow-on Fund</td>
</tr>
<tr>
<td>Core - Separate Account</td>
</tr>
<tr>
<td>Non-Core - Separate Account</td>
</tr>
</tbody>
</table>
In order for a public pension board of trustees to continue to provide effective oversight of its investment program under this type of delegated investment authority, leading practice is to have strong capabilities in a number of areas which provide the appropriate management assertions and independent oversight that are necessary for the Board to exercise its fiduciary responsibilities:

- A clearly-articulated investment policy statement (IPS) which identifies the board’s investment beliefs and risk tolerance, investment allocation decisions, and related policies to be implemented;
- Transparency to the board of decision rationale for investments made by investment staff;
- An internal investment decision-making committee or group which provides a peer review of each investment opportunity and includes other key staff such as general counsel, compliance, and operational due diligence;
- Organizational checks and balances which provide effective controls and minimize the potential for single point of failure decision making;
- Effective investment risk management policies, procedures and reporting;
- An effective investment compliance function which ensures investments remain within policy guidelines;
- An effective internal audit capability and process which monitors investment processes and controls;
- A general investment consultant which is hired by the board, provides counsel to both the board and investment staff, and opines on investment staff decisions; and,
- Other external sources of independent information to the Board, for example, an investment consultant independent of staff, peer investment performance benchmarking or fiduciary reviews.

It is notable that TRS has addressed improvements in each of these areas since delegating investment decision-making to IMD. The following briefly summarizes the changes which TRS has implemented and their level of maturity:

1. The IPS, which is comprehensive, has evolved from a rules-based policy statement to one which is built more on principles of the investment strategy. This is an appropriate development because it provides more latitude for the IMD staff to implement Board policy but still provides effective guidance. As mentioned in more detail in the body of this report, there may be a few areas where the IPS could be more specific in its policy details.

2. As explained to the FAS team during our interviews, reporting on investment decisions to the Board is primarily contained in the Transparency Report, a monthly reporting package from IMD to the Board which contains all Internal Investment Committee (IIC) minutes, a detailed analysis of each investment approved, a list of upcoming investments being considered, and a performance report by asset class.

3. The IIC, which is chaired by the Deputy Chief Investment Officer (Deputy CIO), along with a
pre-IIC meeting chaired by the Chief of Staff, have become the focal points for investment
decision-making at TRS. The pre-IIC and IIC meetings are the forums where potential
investments are vetted by senior IMD staff, but also provide the structure and discipline to
ensure that all investment decisions are evaluated with a rigorous process. In addition, new
external investment opportunities are only considered if a manager has been on the Premier
List for at least six months, which forces a very methodical process.

4. In addition to the vetting by the IIC, the Executive Director (ED) also has the authority to
override any investment decision approved by the IIC. Although this would be an unusual
occurrence, and indeed has not yet occurred, it provides an opportunity for the ED to guide
the process and represents an organizational check and balance available to further vet
investment decisions.

5. IMD has developed risk management policies, staff and capabilities which are leading
practice for large public pension systems. The risk group has appropriate analytical tools, is
engaged with each asset class team, and presents its assessment to the Board twice
annually. The risk management team has collaborated with outside risk experts to develop
more effective approaches for measuring risk in private markets.

6. The Compliance function at TRS, although still developing and growing, has been
strengthened significantly over the past few years and is now part of the Office of the
General Counsel, which reports independently of IMD. Previously, IMD had completed much
of its own compliance reviews before responsibility for this shifted a few years ago to
Internal Audit before the Compliance function was moved to the Office of the General
Counsel. Compliance now has a structured, risk-based approach, is involved in compliance
reviews for new investments, and is making reports to the Board through the Audit
Committee.

7. The Chief Audit Executive reports directly to the Board through the Audit Committee, a
prevailing practice for public pension funds which provides for an added degree of
independence from IMD. Internal Audit (IA) reviews each area within IMD every three years
on a rotating basis, with a high degree of focus on due diligence and monitoring processes. IA
has a dedicated team which audits the asset side of TRS.

8. The general investment consultant is hired by the Board and serves as an advisor to the
Board, in addition to its role as an extension of IMD staff on an as needed basis. Potential
changes in investment policy or guidelines which are proposed to the Board are reviewed and
vetted by the investment consultant. In recent years, the general investment consultant has
had access to all materials from IMD which are presented to the Board.

9. In addition to the general investment consultant, TRS has had its own independent
investment consultant for many years. This consultant attends all Board and committee
meetings dealing with investment-related topics, and also opines on all investment-related
policy changes. The consultant, who has served the TRS Board since 1999, provides an
important independent source of advice and another check and balance on the IMD staff.
Also, TRS periodically engages CEM Benchmarking Inc. to conduct an Investment Cost
Effectiveness Analysis, with the most recent report completed during 2015. This report
compares TRS’ investment performance against its peers, as well as normalized investment expenses, including manager fees, which provides an independent review to the Board regarding IMD’s effectiveness and efficiency in managing its investment operations.

In summary, we believe that TRS has made significant improvements in its governance of trust investments and utilizes many leading practices in comparison to its peers. While these policies and processes apply more broadly than just the real assets portfolio, they do govern the oversight and management of real assets which is assessed in the remainder of this report.
1. Appropriateness of TRS’s goals and objectives of investing in real assets

Activities completed:

The objective of this scope item was to identify and review for appropriateness the stated goals and objectives of TRS with respect to its investments in Real Assets. The assessment included a review of the Investment Policy Statement (IPS), the Real Assets Board Report, the Texas Way document, as well as other documents and Staff and Consultant interviews. The scope of the review covered the real assets program’s overall fit within the Trust, allowed investments, benchmark assumptions, and other policy considerations.

The Real Assets program experienced a change in investment scope in the latest update to the IPS in September 2016. The most relevant updates included a change of the Real Assets Portfolio Authorized Investments, which now excludes investments in infrastructure, timber, agricultural real estate, and oil and gas. These investments and associated allocation will be allocated to the Energy and Natural Resources (ENR) asset class. The amended asset class would be called Energy, Natural Resources, and Infrastructure (ENRI) and the target allocation increased to 5% from its past level of 3%. The Real Assets asset class now has a target allocation of 14% and consists entirely of Real Estate investment opportunities. Due to these changes, the associated discussion will largely focus on Real Estate sectors with pointed discussions on other Real Asset sectors, as appropriate.

Standard of comparison:

As a proxy for appropriateness and best practices, a sample set of large U.S. and Canadian public pension funds was reviewed to compare the approach of other institutional and sophisticated Real Asset investors. Sovereign Wealth Plans were not included in this review as information was largely not available. The sample set programs all have an IPS that covers Real Assets (or similar asset classes) and identifies key characteristics sought as well as guidance and rules regarding the deployment of capital.

Although not exhaustive, the below examples represent some of the more common Real Asset objectives.

- **Investment Scope**: Overall, this is a widely invested asset class; however, Real Assets is not a standardized portfolio allocation across investors. A number of Institutional Investors categorize this allocation as including Real Estate, Natural Resources (e.g., Energy, Timberland, Agriculture, Metals and Mining), and Infrastructure. It is also common to see these allocations in different groupings or for an investor to have separate allocations to each of these investable areas. It is also not uncommon to see Energy and Mining investments included in Private Equity with land based strategies included in Real Estate. Other nomenclature used to describe these assets include; Tangible Assets, Inflation Sensitive, Hard Assets, and Real Return.

- **Diversification**: Real Assets are generally accepted to have low or negative correlations to other asset classes over long term periods. Among the sample set of institutional investors, diversification is a common objective.
• **Performance Expectations:** Due to the fact that the TRS Real Assets program is focused on Real Estate opportunities, Natural Resources and Infrastructure benchmarks are not relevant for comparison and will not be discussed. For Real Estate, the sample set of institutional investors largely use the NCREIF ODCE index as a benchmark for performance. This index is a U.S.-focused Core Real Estate Index. Investment Strategies are varied but can be generalized as focusing on either income generation, capital appreciation, or a mixture of the two. A Core strategy generally focuses more on income generation while value-added or opportunistic strategies have a capital appreciation expectation. Programs targeting a core portfolio generally target the NCREIF ODCE while those focused on capital appreciation typically utilize the NCREIF ODCE index with an associated premium (e.g., NCREIF ODCE plus 2%). Benchmarks will be further discussed in Scope Item #3. Other benchmarks used include an absolute return (CPI plus a premium), the NCREIF Property Index, a weighted average cost of capital approach, and a blended approach of regional IPD (Investment Property Databank) and NCREIF real estate indices.

• **Inflation Sensitivity:** The ability to have positive performance during an inflationary period is a key characteristic of Real Assets. Among the sample set of institutional investors, inflation linkage is a common objective. It should be noted that there are different levels of inflation sensitivity across Real Estate, Infrastructure, Natural Resources, and by their associated investment strategy; however, all of these areas provide benefits versus public equities during inflationary periods.

• **Portfolio Considerations:** The low correlation alongside investment return projections and volatility are important factors in developing a portfolio construction framework. Among the sample set of institutional investors, the average allocation to Real Estate was 10% with two plans reaching as high as 15%. Infrastructure and Natural Resources are generally smaller allocations ranging in the 3% to 5% range.

**Findings:**

1.1. **Overall, TRS’ Real Asset Program goals and objectives are generally appropriate.**

This conclusion was derived from the above “Standard of Comparison” review as well as through TRS’ current Real Asset investment strategy and expectations.

• **Investment Scope:** Although the Real Assets program is now only focused on Real Estate, the Trust has exposure to both Infrastructure and Natural Resources through a separate but dedicated allocation. Additionally, the permitted Real Estate sectors and strategies outlined in the IPS appear to be robust.

• **Diversification:** The TRS Real Assets program has a specific objective in the IPS to provide the Trust diversification through both low correlations to other asset classes and by portfolio construction. This objective is in line with other large institutional investors and with TRS’ current portfolio.

• **Performance Expectations:** TRS’ stated objective is to provide the Trust with competitive
returns through capital appreciation and alpha generation. This objective is in line with other large institutional investors and with TRS’ current portfolio.

- **Inflation Sensitivity:** The Real Assets program makes up the largest allocation to the Trust’s Real Return strategy. The Real Return Strategy includes Energy, Natural Resources, Infrastructure, and Inflation-Linked Bonds and is meant to provide positive performance for the Trust during an inflationary period. This is part of an economic regime management strategy that also includes Global Equity and Stable Value strategies. This objective is in line with other large institutional investors and with TRS’ current portfolio.

- **Portfolio Considerations:** The Real Assets program has a target allocation of 14% which is generally in line with other large institutional investors. Additionally, TRS is expected to reach this target by 2018 based on current investment pacing and expected capital deployment.

**Opportunities for improvement:**

**R1.1:** A specific Real Assets objective for inflation hedging or linkage should be added to the IPS.

Real Assets is the largest allocation in the Real Return strategy, which is meant to provide an inflationary hedge. This addition would also align Real Assets with the ENRI’s policy objective for inflation sensitivity.

**R1.2:** TRS should consider implementing a NCREIF ODCE plus premium approach to establishing a benchmark that matches the current portfolio construction with regard to risk.

The Real Assets program currently utilizes the NCREIF ODCE (National Council of Real Estate Investment Fiduciaries – Open-End Diversified Core Equity) index for a benchmark and has an alpha target maximum of 1.25% above the index for incentive compensation calculation purposes. A NCREIF ODCE + premium percentage would be a suitable approach that would reflect TRS Real Asset strategy and portfolio construction. Although this would not be an investable index, it is suitable approach due to the relative lack of generally accepted, robust, or transparent Real Estate benchmarks currently available that would directly reflect TRS’ investment strategy. The Real Assets staff is working with other providers, such as the Investment Property Databank (IPD), to help provide a more accurate benchmark, but likely that is not a near-term option.
2. Adequacy of the Board’s policies governing real assets

Activities completed:

The overview of activities included earlier in this report encompasses those activities relevant to this topic. Nonetheless, it is worth highlighting the key items. Pertinent Board policies are contained primarily in the Investment Policy Statement (IPS) and the Board’s By-laws. While this evaluation is focused on Real Assets, many general governance policies are critical for the Real Assets program, just as they are for operations of TRS in general, and those policies are referenced in the discussion that follows. Interviews that were important to this topic were the four trustee interviews, as well as those with the Executive Director, CIO, internal audit team, legal counsel and Chief Compliance Officer and investment consultants. Other documents and interviews provided elaboration and extension for the analysis.

Standard of comparison:

TRS ranks among the largest pension plans in the world, public or private. Its investment program is central to defeasing an identifiable, long-term liability. The size and responsibility of TRS dictate that it should operate using the best practices of institutions serving like functions globally.

TRS has appropriately chosen to look to some of the U.S.-based endowments and Canadian public pension funds as role models. While there are other models that also could be referenced, these comparators are generally recognized by the institutional investor community at large for having adopted leading practices. We believe that certain governance characteristics are necessary as a foundation for the establishment of leading practices.

Stated most broadly, the desirable characteristics begin with a governing body (in this case a board) that:

1. Sets clear fundamental investment principles, policies, and objectives;
2. Delegates implementation to professional staff and advisors, with clearly defined roles;
3. Provides the necessary resources for successful implementation;
4. Establishes means for assessing the implementation by staff and advisors of delegated authorities;
5. Includes, as part of its oversight, independent means for validating the execution of delegated authorities and compliance with policies, and;
6. Provides disciplined processes for the operation of the board itself and for reviewing and updating the policy framework.

The following assessment was conducted with reference to this standard, as applied to the Real Assets (RA) program.
Findings

2.1. TRS has adopted a principles-based approach to its Investment Policy Statement, which is appropriate to its mission and environment, and provides the necessary fundamental principles, policies and objectives.

The primary expression of policy by the TRS Board is through its IPS. TRS has chosen to adopt primarily a principles-based approach to drafting its IPS, rather than a rules-based approach that would set a variety of specific requirements and limits for investing. That decision is appropriate given the size and global scope of the investment operation, the ability of TRS to build a team of highly qualified staff members, the mixture of financial professionals and financial lay-people on the Board, and TRS’ investment in a broad range of sophisticated assets. The Standard of Comparison articulated above is consistent with such a principles-based approach.

The Board has also incorporated a number of items as appendices to the IPS. For purposes of this topic of the review, the most pertinent are Appendices B, E and F. (IIC Approval Authority and Manager Organization Allocation Limits; General Authority Resolution; and Political Contributions, Improper Influence, Board Observers and Board Representation, respectively). Finally, the Board’s Bylaws are important to the overall evaluation of policy.

Taken together, the various expressions of policy articulate fundamental investment principles, policies, and objectives. The following, pertinent to the RA portfolio, are specifically addressed:

- Fund level and Real Assets objectives;
- General Private Market portfolio (of which RA is a part) criteria and processes;
- Authorized RA investments and restrictions;
- General investment processes for RA;
- Allocation target and ranges for RA;
- Risk management factors and general approaches;
- Ethics issues – in particular, political contributions, improper influence, placement agents and finders; and,
- Measurement and reporting criteria (more specifically addressed in Findings 2.4 and 2.5 below).

In reviewing the specifics of the referenced policies, we made note of no material deficiency. One item that may be further clarified is the articulation of objectives for real assets. The IPS specifically identifies diversification and competitive returns through capital appreciation as objectives for RA. Yet in the annual report by the RA staff to the trustees, under Primary Objectives it states: “Portfolio is a partial hedge to inflationary environments and diversifier to the Trust.” (See page 15 of the 2016 presentation.) In discussing the role of the RA with trustees and staff there was general consistency in articulating diversification and returns as the foci for the portfolio, while acknowledging a potential collateral benefit of inflation protection. (Also, as noted in Item 1 of this report, inflation protection is generally recognized by other institutional investors as an objective of similar portfolios.) It is not our
expectation that any revision in the RA portfolio would result, but it seems for the sake of clarity and consistency that TRS may want to consider some adjustment to the IPS to acknowledge the inflation protection factor. (See Opportunity for Improvement 1 below.)

One further issue should be mentioned in this area of the policy review. A number of institutional investors have chosen in recent years to broadly address ESG (environmental, social and governance) investing considerations as a part of their investment policies. In the case of TRS, the Board received an extensive presentation from its general investment consultant and Board investment advisor on the ESG topic earlier this year. After receiving and considering that information the Board made no changes to its policies. This approach of educating itself and deciding de facto that no policy revisions were indicated seems to us a reasonable approach and outcome.

2.2. The Board’s policies include a broad delegation to staff and advisors for implementation of the Real Assets policies, and provide role definitions and articulation for all relevant parties.

The IPS and its appendices provide a broad delegation to staff and advisors for implementing the Board’s investment policies. This approach is consistent with the leading practice for large institutional investors similar to TRS. It also should be noted this is consistent with Texas law, contained in Sec.825.113 of the Texas Government Code, which provides in part: (b) The board shall develop and implement policies that clearly separate the policy-making responsibilities of the board and the management responsibilities of the executive director and the staff of the retirement system.

The TRS policies define the parameters of the delegation and in some instances prescribe processes to be used (see Article 3.4 of the IPS), which are consistent with the Board’s responsibilities. Taken as a whole, the policies effectively authorize, empower and define parameters. The following particulars are addressed in the IPS and appendices:

- Roles of Board, staff, consultants and advisors;
- Private markets portfolio authorization, investment process and authorized investments;
- Real assets authorized investments;
- IIC approval authority and limits; and,
- Powers delegated.

In reviewing the specifics of the referenced policies we note the following areas where the policies may be enhanced.

The Board has placed limits on the size of individual commitments that may be made to a single real assets manager organization. However, there is no annual limit on the total of commitments made. The inclusion of an annual limit may enhance the established set of parameters.

In practice, the RA staff submits an annual capital plan to the Board that addresses expected/potential commitments. The Board does not take action with respect to the plan, however. Given the broad delegation provided to the staff, and the fact that in effect the RA portfolio is managed consistent with the annual capital plans, it would make sense for the Board to act to endorse the annual plan. Such an
act would formalize the Board’s guidance that portfolio activities are consistent with the broad policy guidance in the IPS.

By enacting annual limits and/or modifying the annual capital plan process, the Board may clarify delegation and enhance its oversight. (See Opportunities for Improvement R2.2 and R2.3 below.)

2.3. The policy framework provides mechanisms for assuring that resource needs are addressed.

As noted above, TRS appropriately seeks to operate an investment program that meets the standards of the best institutional investors. Providing adequate resources for such an operation is difficult in a governmental setting, particularly in the context of staff size, qualification and compensation. In our view, providing a governing board with full budget authority is the optimum governance structure. The budget for TRS is a part of the state legislative process, however, and placing the right emphasis and focus on resources, including staff resources, is a critical part of the Board’s job. The Board has adopted policy provisions aimed at that task.

The IPS itself requires at least annual reporting of staffing to the Board, placing the Board in an informed position. The IPS also authorizes staff to acquire consulting resources where beneficial to augment staff resources, providing a needed flexibility.

In the Bylaws, the Board has established standing committees for budget and for staff compensation. Part of the mandate for the compensation committee is to help maintain the performance incentive pay plan, an important tool in staffing an institutional quality investment program.

Taken together, these policies provide the needed awareness and Board priority for addressing resource needs.

2.4. Through its required reporting and reviews, the Board has effective means for monitoring the implementation of its policies.

Once the Board has delegated authority it must, of course, be able to assess whether its policies are being carried out and the results of that implementation. The TRS Board, as part of its policy framework, has established a substantial reporting regimen. In Article 1.7 of the IPS, the Board requires a number of specific reports, addressing among other topics:

- Performance;
- Compliance;
- Asset exposures;
- Anticipated investments;
- Existing investments;
- Derivatives;
- Risks;
• Private markets (including RA) long-term strategy;

• Staffing; and,

• Other matters as the Board may decide ad hoc.

Also relevant are the roles of the Board’s standing Audit and Risk Management Committees in requesting and receiving reports from the Internal Audit Department (IAD), the Chief Compliance Officer (CCO), Investment Risk Management and Enterprise Risk Management.

Finally, it is worth noting that the Transparency Report, required by 1.7 of the IPS, includes the minutes of the Internal Investment Committee (IIC), thereby giving the Board not only advance knowledge of planned RA investments, but some insight to the deliberation of IIC. (See additional discussion of the IIC below.)

2.5. **The Board’s policies provide substantial independent assurance, reporting, and advice as part of its oversight, using TRS staff, and third parties.**

Closely related to the subject matter of Finding 2.4 is the need for the Board to have assurance, reporting, and advice independent of the staff and advisors to whom it has delegated, that it is receiving full and accurate information concerning the implementation of its investment policies, and that its policies are being followed. The TRS policy framework seeks to provide that in a number of ways.

In general, the Board has delegated investment authority that is not reserved to the Board itself (such as setting asset allocation) to the staff of the Investment Management Division (IMD) of TRS. There are several instances in which that authority has been delegated subject to concurrence by multiple parties. These structures act as a sort of check and balance.

Most notably, Article 3.4 of the IPS, which governs RA investments, requires in general the concurrence of the staff and the advisor (the selection of which is itself subject to Board concurrence) before an investment can be made without Board approval.

In addition, the IPS establishes the IIC, which must vote to approve RA investments, subject to the chief investment officer’s (CIO) veto. The IIC consists of staff members of the Investment Management Division, but relevant to RA investing, membership extends beyond the staff focused on RA investing. The IIC must also approve any RA investment going to the Board as the result of non-concurrence between the staff and advisor. Finally, the IPS authorizes the Executive Director, who is not a member of the IIC, to veto investments approved by the IIC, after consulting with the CIO.

These concurrence mechanisms provide multiple perspectives as part of the decision process, and mandate agreement by multiple parties who have a connection to the Board.

The policies also provide a range of more traditional means for independent assurance.

The Chief Audit Executive (CAE) is hired by and reports to the Board. A standing Audit Committee of the Board coordinates the audit program with the CAE. That committee also coordinates with the
external auditor hired to conduct financial and performance audits of TRS.

The Chief Compliance Officer (CCO) is charged by the IPS with testing compliance with the IPS. The CCO, who is not part of the IMD, must report exceptions to the Board. In addition, the Audit Committee recently began scheduling regular reports from the CCO (see Item 5 of this report for a more detailed treatment of the Compliance function.)

The IPS defines the role of the investment consultant to the Board as including independent advice on investment matters as well as responsibility for performance reporting. As a matter of practice, the general investment consultant attends each Board meeting. In addition, the Board has a long-standing (more than 16 years) practice of using its own investment advisor in advising the Board on policy and other matters.

Finally, while the CIO is hired by the Board, the Bylaws provide that the executive director of TRS has authority with respect to the CIO’s “assignment of duties, evaluation, compensation and discipline.” As a personnel arrangement this may be atypical, but at the very least it does provide an additional party, independent of those to whom delegation has been made, who is motivated to provide independent feedback and assurance to the Board with respect to investment operations.

2.6. The Board’s policies appropriately address its own governance and provide for regular review of the Board’s policies.

A governing board should have as a part of its policy framework clear and complete means for its own operation. Those means should include how information is brought to the board and how the board will address issues and reach decisions. In addition, there should be regular reviews of the policies and orderly methods to consider potential changes. The TRS policies have the necessary provisions.

The Board’s Bylaws include a complete system for developing agendas, conducting meetings and handling matters through standing committees. Provisions of the IPS referenced above more specifically address how certain matters should be surfaced to the board—proposed investments (including in the RA portfolio) where there is a lack of concurrence, compliance exceptions and investments under consideration, as examples.

The IPS also specifically calls for a review of the IPS at least every three years. In practice this occurs more frequently. Further, it provides the Board will receive policy advice from the IMD and from the Board’s consultant. A legal review process for policy changes is prescribed. Finally, the Bylaws establish a standing Policy Committee with responsibility to review and recommend policy changes and assure regular policy reviews.

Opportunities for Improvement

R2.1: TRS should consider whether, for clarity and completeness, a reference to inflation protection should be included in Article 5.1 of the IPS.

Based on the annual presentation from RA staff and the interviews with staff and trustees, it seems inflation protection is at least an ancillary objective of the RA portfolio. A reference in Article 5.1...
would be consistent with that objective.

**R2.2:** The TRS staff should provide the Board the annual capital plan for the Real Assets portfolio as soon as it is final each year and include an update on the capital plan with each quarterly Transparency Report.

This enhanced communication should not limit latitude of staff and the advisor to adjust activity over the course of the year, as is currently the case, but simply keep the Board fully advised of capital plans and execution.

**R2.3:** TRS should include in Appendix B of the IPS a limit on the total Real Assets commitments that can be made in a single year.

There are limits on the size of individual commitments, but no annual limit on commitments. An annual limit would provide a more complete set of parameters for oversight. The limit could be stated as a dollar amount, a percentage of the fund or some other metric pertinent to the RA program.
3. Effectiveness of TRS’s investments in real assets (whether TRS has been meeting the goals and objectives of the real assets program)

Activities completed:

At the time we initiated our engagement, the TRS Real Assets program allowed for investment in disparate assets across real estate, infrastructure, and select natural resource sectors (timber and agriculture). The objective of this scope was to review the allocations to each of these disparate segments and compare them to the stated goals of the program, noting factors that contributed to or detracted from performance (e.g., sector allocation, investment selection, geography). During our engagement, TRS made a strategic decision to remove infrastructure, land and natural resources from the “Other Real Assets” sub-sector of the Real Assets program, and move infrastructure and natural resources to the Energy and Natural Resources allocation and land strategies to Opportunistic Real Estate. This change limited our review to focus on real estate. In addition to the scope of Item 1, Item 3 also included a review of the program’s benchmark and whether it is prudent based on the current allocation of capital and based on future expectations. The current real assets benchmark is the NCREIF ODCE (National Council of Real Estate Investment Fiduciaries – Open-End Diversified Core Equity) index which is primarily a real estate index.

The review included a discussion with the Real Assets Team, functional head of Real Assets including principal investments, head of Private Equity, Chief Risk Officer, Deputy CIO, and CIO as well as the Trust’s consultants.

Standard of comparison:

As outlined in the Trust’s Investment Policy Statement there are three main investment objectives of the Real Assets portfolio:

1. As the primary focus, contribute favorably to diversification of the Total Fund through exposure to real assets’ low or negative correlation to the Public Markets portfolio.
2. Provide competitive returns through capital appreciation.
3. The following attributes will be considered in constructing a diversified Real Assets portfolio: strategy, geography, property types, size of investment, vintage year, and the number of funds or investment managers represented in the portfolio. No specific geographic diversification or leverage targets are required.

As it relates to diversification and correlation, TRS currently measures and reports correlation as a separate and defined risk statistic at a portfolio level. This analysis is included in the Board report and measures Real Assets correlation to Real Return, Global Equities, and Stable Value. In addition, correlation assumptions are embedded in the risk reporting (especially VaR (Value at Risk) and tracking error calculations) that the Trust reports to the Board and to the Investment Management Committee. These calculations embed as their assumption the realized correlation on an expanding window basis from a start date of 1/1/08 to the date of the report. The Risk Management Group prepares this reporting as part of: 1) its semi-annual presentation to the Board Risk Committee; and,
2) as part of its monthly report to the Management Committee.

In addition, the Asset Allocation Group develops specific correlation estimates every five years as a part of the Strategic Asset Allocation (SAA) process. For example, the table below provided by TRS shows the correlations to real estate that they assumed in the 2014 SAA Study compared to the actual experience of the Trust.

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>2014 SAA Study Assump.</th>
<th>TRS Actual Realized as of 9/30/16 3Y</th>
<th>Since 1/1/08</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>0.35</td>
<td>0.09</td>
<td>-0.23</td>
</tr>
<tr>
<td>US Large Cap Growth</td>
<td>0.33</td>
<td>0.11</td>
<td>-0.27</td>
</tr>
<tr>
<td>US Large Cap Value</td>
<td>0.37</td>
<td>0.17</td>
<td>-0.11</td>
</tr>
<tr>
<td>US Small Cap</td>
<td>0.37</td>
<td>-0.05</td>
<td>-0.30</td>
</tr>
<tr>
<td>Non-US Developed</td>
<td>0.35</td>
<td>0.07</td>
<td>-0.33</td>
</tr>
<tr>
<td>Emerging Markets</td>
<td>0.30</td>
<td>0.06</td>
<td>-0.44</td>
</tr>
<tr>
<td>Hedge Funds - Directional</td>
<td>0.20</td>
<td>0.13</td>
<td>0.06</td>
</tr>
<tr>
<td>Private Equity</td>
<td>0.34</td>
<td>0.68</td>
<td>0.60</td>
</tr>
<tr>
<td>US Long Treasuries</td>
<td>-0.07</td>
<td>-0.37</td>
<td>-0.01</td>
</tr>
<tr>
<td>Cash</td>
<td>-0.01</td>
<td>-0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Hedge Funds - Stable Value</td>
<td>0.20</td>
<td>-0.21</td>
<td>0.05</td>
</tr>
<tr>
<td>Inflation-Linked Bonds</td>
<td>0.06</td>
<td>-0.30</td>
<td>-0.56</td>
</tr>
<tr>
<td>Commodities</td>
<td>0.18</td>
<td>-0.24</td>
<td>-0.13</td>
</tr>
<tr>
<td>ENR</td>
<td>0.80</td>
<td>-0.21</td>
<td>-0.06</td>
</tr>
<tr>
<td>Risk Parity</td>
<td>0.54</td>
<td>-0.05</td>
<td>0.04</td>
</tr>
</tbody>
</table>

The Real Assets portfolio performance is reported regularly by the custodian bank and the Real Assets consultant. We have reviewed these reports as well as interviewed each body. As of March 31, 2016, the custodian bank reported a time-weighted return on the Real Assets portfolio of 12.37% over the 5-year period and a since inception IRR of 8.57%.

Similarly, the Real Assets investment consultant reported an 8.5% net IRR over the same period for total Real Assets. The Real Assets investment consultant quarterly report breaks down income versus appreciation across Real Assets sub-sectors. Overall, the Real Assets portfolio’s total gross time-weighted return over the five-year period is 14.2%, comprised of 4.6% income and 9.3% appreciation.

The Real Asset’s portfolio benchmark, the NCREIF ODCE, is a capitalization-weighted, time-weighted return index composed of the returns reported by 30 open-end commingled funds pursuing a core investment strategy. In order to participate in the index funds must adhere to a series of criteria including: 1) at least 80% of the market value of real estate net asset must be invested in private equity real estate properties; 2) domain – at least 95% of market value of real estate net assets
must be invested in US markets; 3) property types – at least 80% of market value of real estate net assets must be invested in office, industrial, apartment, and retail property types; 4) life cycle – at least 80% of market value of real estate net assets must be invested in operating properties, no more than 20% of such assets may be invested in pre-development/development or initial lease-up/lease-up cycle; 5) diversification – no more than 65% of market value of real estate net assets may be invested in one property type or one region as defined by the NPI (National Property Index); and lastly, 5) leverage is limited to 40%.

As of March 31, 2016, the NCREIF ODCE’s property exposure was as follows: apartment (24%), office (38%), industrial (14%), retail (20%), hotel (1%) and other (3%). As previously mentioned, this index is nearly entirely comprised of U.S.-based assets.

Findings:

3.1. Overall, TRS’ Real Assets program goals and objectives are being met.

This conclusion was derived from the above “Standard of Comparison” review and in conjunction with Item 1.

- **Correlation**: Current correlation across public markets is relatively low. The actual experience of the Trust has been lower than projected by the Risk Management Group and is generally low on an absolute basis. Correlation is measured and reported on a semi-annual basis to both executive management and the Board of Trustees.

- **Appreciation**: Overall, the Real Assets portfolio’s total gross time-weighted return over the five-year period is 14.2%, comprised of 4.6% income and 9.3% appreciation. The experience across sub-sectors was consistent and appropriate for each strategy’s expected return drivers. It is likely that the removal of infrastructure from the Real Assets portfolio will enhance the portfolio’s appreciation return at the expense of income production.

- **Diversification**: The Trust is well-diversified by the IPS’ stated metrics. Strategy exposure is robust and appropriate and well-diversified across the U.S. on both an absolute and relative basis to the NCREIF ODCE. As a portion of market, the Trust’s ex-U.S. exposure is 13%, split across Europe (7%), Asia (4%), and Latin America (2%). TRS is well-diversified across the major property types, including apartment, office, industrial, retail, and hotel with notable underweights to apartments (-9%), office (-11%), and retail (-5%) as compared to the NCREIF ODCE. These underweights are partially due to exposure to specialty real estate including public storage, single-family housing, senior housing, and other specialized property types. While size of investment is not explicitly measured, commitment and investment amounts appear appropriate for the size of the Trust’s program. The Real Assets portfolio is well-diversified by vintage year, number of funds, and investment manager taking into consideration the premier list investment approach.
Opportunities for improvement:

**R3.1:** TRS should consider a review of the real assets benchmark. An ideal benchmark would encompass the global nature of the program, exposure to non-core real estate, and the allocation to various property types.

Based on current allocation and future expectations, the NCREIF ODCE is a moderate proxy given the Real Assets portfolio’s large exposure to real estate; however, its effectiveness could potentially be improved. Some other institutional investors supplement the NCREIF ODCE with a public global proxy such as the FTSE EPRA/NAREIT (Financial Times Stock Exchange European Public Real Estate Association/National Association of Real Estate Investment Trusts) Global Real Estate Index to match their geographic target. There are a number of non-core benchmark providers, including the Trust’s Real Assets consultant, who provide these services. Others include Preqin, Cambridge Associates, IPD, NCREIF CEVA (Closed End Value Add), and Pitchbook.
4. Adequacy of TRS’s identification of significant risks related to the real assets program

Activities completed:

The objective of this scope item was to evaluate the investments in the real asset portfolio and to examine diversification by various sources of risk/reward. Traditional proxies for these sources include exposure to geographic region, currency, strategy type, and sector. In addition, we evaluated the overall level of risk present in the portfolio with respect to development, leverage, and operating risk, among other factors. Separately, we will evaluate the process by which TRS manages these risks in the portfolio management process.

The review included a high-level review of the Investment Policy Statement and total plan’s reported key risk metrics, with a particular focus on how these risks were identified and measured as it relates to the Real Assets program. We also reviewed the aforementioned stated traditional proxies which included a discussion with the Real Assets Team, functional head of Real Assets including principal investments, functional head of Private Markets, Chief Risk Officer, Head of Asset Allocation, Deputy CIO, and CIO, as well as the Trust’s consultants.

Standard of comparison:

As outlined in the Trust’s Investment Policy Statement, there are five key risk metrics listed below. TRS completes semi-annual Investment Risk Reports which are prepared and presented by the Chief Risk Officer to the Board. As of June 30, 2016, the Trust was found fully compliant across policy requirements.

1. Market Risk, including:
   a. Value at Risk (VaR): VaR was measured at 6.8% across the total plan compared to the benchmark of 6.4%. Real Assets VaR was measured at 20.3% above the dollar-weighted asset allocation of 14.2%. Real Assets is not intended to provide risk reduction but as outlined in Scope Item 3, to provide diversification and capital appreciation. Real Return’s contribution to VaR appears appropriate compared to the Global Equity and Stable Value programs.
   b. Asset Allocation limits: The 14% allocation to Real Assets is in compliance with policy.
   c. Holdings Analysis: TRS is making strides in collecting more detailed asset-level data across the Real Assets program through eFront. This is further explored in Scope Item 8.
   d. Tracking Error: The Risk Management Group forecasts the tracking error of Real Assets at 481 bps. This forecast uses past experiences from 2008 to the present and therefore includes the effects of the Global Financial Crisis. In addition, private asset class forecasts (including for Real Assets) are unsmoothed so as to be comparable the Trust’s public asset classes. As actually realized, Real Assets tracking error will tend to be lower than the unsmoothed forecast and the 3-year realized tracking error is
2. Foreign Exchange Risk: Fund level currency exposure is included in eFront quarterly dashboards that the Real Assets team has access to and it is also reported in the custodian bank monthly reports. The Real Assets investment consultant also completes a review of foreign currency and attribution in their quarterly reports. Currently, the Real Assets program’s ex-U.S. exposure is approximately 13% as measured by market value.

3. Credit Risk: While measured by The Risk Management Group, the view of counterparty risk as it relates to the Real Assets program is mitigated by the removal of Infrastructure investments (i.e. transportation, utility, communication sectors) from Real Assets.

4. Liquidity Risk: TRS assumes for all practical purposes that private asset classes including: 1) Private Equity; 2) Real Assets; and 3) Energy Natural Resources and Infrastructure, are completely illiquid. The Risk Management Group prepares a Trust liquidity analysis for the Board on a semi-annual basis. In addition, the Asset Allocation Group monitors total Trust liquidity on a daily basis. This is the most conservative approach to liquidity analysis and the Trust estimates net liquidity of $39.9 million or 32% of total plan assets.

5. Leverage Risk: The Real Assets Program’s loan to value as of June 30, 2016 was approximately 40%. The program’s leverage will increase with the removal of Infrastructure; the Other Real Assets Program’s leverage is approximately 25%. The ODCE index has a stated maximum loan to value of 40%; however, institutional investors typically target leverage at a loan to value of 50% to 60%. This accounts for the addition of value-added and opportunistic strategies which can have a higher level of leverage.

Findings:

4.1. Overall, TRS’ identification and monitoring of key risks within the Real Assets program appear adequate.

This conclusion was derived from the above “Standard of Comparison” review and in conjunction with Scope Item 3.

- **Diversification**: As further outlined in Scope Item 3, the Real Assets program is well-diversified by geographic region, strategy type, and sector. Currency exposure appears appropriate for a USD-denominated plan. While the Trust has predominantly experienced foreign exchange losses, for a plan of their size, global diversification is appropriate and the level of participation is reasonable.

- **Operating Risk**: While some of the specialty real estate investments offer defensive characteristics, they also may be susceptible to operating risk. Operating Risk in the Real Assets program is likely to fall with the removal of Infrastructure.

- **Alpha Target Reduction**: The Real Assets program previously was managed to an alpha target of 2.5% above the program’s benchmark, the NCREIF ODCE, for incentive compensation calculation purposes. The reduction of this alpha target to 1.25% is viewed favorably and
should better align the risk profile of the Real Assets program with the stated benchmark.

- **“Risk Card”**: The Real Assets team alongside the Risk Management Group complete a joint risk assessment of principal investments/co-investments. Risk categories include: strategy type, manager experience, geographic diversification, industry diversification, regulatory, accounting, tax and legal, leverage, Investment Management Division’s experience with the manager, “Texas Way” criteria, and the size of the investment.

- **Capital Plan**: As it relates to asset allocation limits, the Real Assets team develops an annual capital plan to generate forward commitments for the program. The capital plan is completed with the guidance of the Asset Allocation group.

- **Development**: Development exposure is likely contained to Opportunistic investments and the sub-sector’s risk/return profile captures this level of risk. The current allocation to Opportunistic is 28%, which falls within a reasonable allocation range.

**Opportunities for improvement:**

**R4.1: TRS should consider a stated limit to the use of leverage.**

Currently the Real Assets program adheres to a set of guidelines that have been produced by the Real Assets Team. The functional Head of Real Assets and External Private Markets Director are primarily responsible for ensuring these guidelines are practiced. While the Real Assets program’s use of leverage is moderate and appropriate for the asset allocation, there have been meaningful increases in the last three years, particularly in the Real Assets Special Situation’s sub-sector in excess of 60% loan-to-value. A stated limit to portfolio leverage may minimize the inherent leverage risk of the portfolio. A second-tier to this limit could be a provision allowing a 36 month re-set if the program was to exceed the stated limit. Alternatively, TRS may consider Board approval for the aforementioned sub-sector leverage guidelines and review on a regular basis.

**R4.2: TRS should consider hedging foreign currency exposure.**

TRS has initiated and should continue to explore the potential benefits of foreign currency hedging.
5. Compliance with the requirements of laws, regulations, and investment policies

Activities completed:

Of the activities identified in the overview at the outset of the report, key documents reviewed for purposes of this section included applicable sections of Texas law, including pertinent sections of the Constitution and Government and Property Codes. We were advised by TRS and we confirmed that there are no “regulations” (i.e., provisions in the Texas Administrative Code) relevant to the Real Assets portfolio. We also relied on the Investment Policy Statement and Quarterly Investment Compliance Testing reports provided to the TRS Audit Committee. Key interviews included (1) the Chief Compliance Officer (CCO) and General Counsel for Investments; (2) The Chief Audit Executive and the Director of Investment Audit Services; and (3) the Executive Director and Deputy Executive Director.

Standard of comparison:

All pension plans, public or private, U.S. or global, operate under some combination of applicable law and investment policy. Evaluating a pension plan’s compliance activities, either generally or in the case of a specific asset class such as Real Assets, involves not only a determination of whether such laws and policies are being followed but also the question of whether there is a sufficiently robust organizational framework in place to provide assurance to senior management and ultimately the governing board that this is the case. In our view, the essential elements of such a framework are as follows:

1. A formal Board policy establishing a permanent and effective compliance function;
2. Sufficient resources dedicated to the compliance function;
3. A clear allocation of responsibilities within senior management with respect to compliance activities;
4. Timely, regular reporting by senior management to the Board with respect to compliance activities, coupled with periodic assurance to the Board that senior management is fulfilling its compliance responsibilities and that system activities conform to applicable laws and policies.

Findings:

5.1. The TRS Board has established a Chief Compliance Officer position and function in its Investment Policy Statement, although it has not adopted a stand-alone Compliance Policy.

At the outset, we note that while our focus is on compliance of the Real Assets Portfolio with applicable laws and rules, compliance activities at TRS are understandably addressed across all asset classes. As such, although we were not specifically tasked with evaluating TRS’ compliance activities as a whole, many of our findings and suggestions inevitably reach beyond Real Assets compliance.
Section 1.7 of the Investment Policy Statement (IPS) specifically provides that the Chief Compliance Officer (CCO) has overall responsibility for compliance monitoring, provides for hiring external parties to assist with compliance monitoring, if necessary, and states that compliance reviews will be presented on a quarterly basis to the TRS Board. Specific responsibilities of the CCO under the IPS include:

- Requiring certifications from applicable Internal Investment Committee members or Managing Directors disclosing known compliance violations;
- Reporting all known compliance exceptions to the Board at its next meeting;
- Executing and delivering compliance-related disclosures, reports, filings and certifications on behalf of TRS;
- With the approval of the Chief Investment Officer and Executive Director, developing, disseminating and collecting disclosure forms to monitor the requirements of the IPS.

Having the above provisions explicitly set out in its IPS places TRS in a leading practice position with respect to its U.S. peers.

5.2. The TRS Board has budgeted sufficient resources for the investment compliance function, and there appears to be strong “top-down” support for investment compliance throughout the organization.

There are three positions (CCO and two direct reports) allocated to the compliance function in the TRS Legal Services Organization. In addition, there is staff in the IMD (Investment Operations and Risk Management divisions) with investment compliance responsibilities, and internal audits, through the Internal Audit Department, devotes substantial staff resources to providing independent reports to the TRS Audit Committee on a quarterly basis concerning compliance matters. In addition to these staff resources throughout TRS, funding has been provided for appropriate systems to support compliance processes. Again, compared to its US peers this is a substantial commitment of resources to the compliance function and is in keeping with TRS’ view point that its most appropriate comparators are U.S. endowments and Canadian pension funds. As such, our view is that, when considered as a whole, the TRS Board has budgeted sufficient resources for the investment compliance function. Importantly, beyond this commitment of resources, in our interviews with senior management and Board members we sensed significant Board and senior management support for the investment compliance function within TRS. One tangible indicator of the growing importance of investment compliance within the organization is the proposed renaming of the Audit Committee to the Audit and Compliance Committee.

5.3. All facets of compliance with laws and policy relating to the Real Assets portfolio are being addressed by TRS senior management, although there is an opportunity to provide greater clarity with respect to the allocation of compliance responsibilities within senior management.
We have identified the following compliance areas provided for in law or the TRS IPS that are applicable or potentially applicable to the Real Assets Portfolio:

- Verification of Internal Investment Committee approval of all Real Asset investments (IPS §1.3).
- Provision of prudence letters by an Advisor for all Real Asset investment opportunities (IPS §§1.3, 3.2).
- Real Assets percentage and range limits in asset allocation (IPS §1.6).
- Leverage is in the Real Assets portfolio (IPS §§1.7.i, 10.9).
- New emerging manager investments (which includes Real Assets emerging manager investments) meet program requirements (IPS §7).
- Real Assets investments are within policy limits (IPS Appendix B).
- Quarterly certification from Real Assets to CCO regarding any known compliance violations (IPS §1.7.b).
- Prohibitions against investments in Sudan, Iran and pornography (to the extent applicable to the Real Assets Portfolio) (IPS §§1.8.d, 1.8.e; Texas Government Code §§806, 807).
- Submission of Placement Agent questionnaires by external fund or manager parties and placement agents (where applicable) (IPS §§1.7, 12).
- Required financial disclosures, ethics compliance statements, disciplinary action disclosure statements and completion of annual ethics training by covered TRS staff under the Employee Ethics Policy.
- Required disclosures and completion of annual ethics training by Board members under the Board of Trustees Ethics Policy.
- Required disclosure by covered employees and contractors under the Trading Policy for Employees and Certain Contractors.
- Required disclosures by TRS contractors under the Code of Ethics for Contractors.

Based on our interviews and document review as well as the quarterly investment compliance testing performed by Internal Audit, all of the above areas are being appropriately addressed by TRS. However, day to day responsibility for them is spread throughout several organizational units of TRS (CCO, IMD/Operations, IMD/Risk Management, and Enterprise Risk Management) and currently there is no single source document that identifies the organizational unit(s) with responsibility for each of these compliance areas.

5.4. Compliance activities with respect to the Real Assets portfolio are regularly reported to the TRS Board through its committees by senior management and internal audits and overall reporting is robust.
The TRS Board, through its Investment Management, Risk Management and Audit Committees, receives reporting on some but not all of the compliance areas. Comprehensive, regular reporting is in the form of quarterly investment compliance testing results provided to the Audit Committee by Internal Audits. All of the areas identified in section 5.3 above are covered by this testing and reporting on an annual cycle, with most areas covered on either a quarterly or every-other-quarter basis. These quarterly reports each include a one-page dashboard that identifies business objectives, business risks, management assertions, agreed-upon procedures, test results and, where applicable, management responses. With one exception not applicable to Real Assets, the testing and reporting in the four most recent quarterly reports reflecting a full-year cycle demonstrated that TRS’ investment activities, including those of the Real Assets portfolio, were in compliance with applicable law and IPS provisions.

The current reporting structure that places significant reliance on Internal Audit is understandable, in that when the compliance function was originally developed it was housed in IMD and subsequently was moved to Internal Audit to provide more independence. The movement of investment compliance to the Legal Services Organization and the hiring of the CCO is a relatively recent development and both our document review and interviews have confirmed that the implementation of this change is a work in progress. As noted in section 5.1 above, the IPS provides that the CCO has overall responsibility for investment compliance monitoring and provides that quarterly compliance reviews will be presented to the TRS Board, without identifying the presenter.

Opportunities for improvement:

**R5.1:** The Board should consider adopting a stand-alone Compliance Policy.

Given the number of reporting elements and programs involved in TRS’ investment compliance efforts as described in sections 5.3 and 5.4, TRS may wish to consider the adoption of a stand-alone Compliance Policy in order to place Board emphasis on the importance of compliance and greater clarity to the respective roles and responsibilities throughout TRS respecting this area.

**R5.2:** TRS should consider mapping the compliance responsibilities and functions of the responsible areas so as to provide a system-wide view of compliance activities.

This effort likely would enhance TRS’ already strong compliance efforts and may provide a foundation for clarifying and optimizing existing program area roles. We note that TRS advised us at our October 25, 2016 interim briefing that they were in the early stages of such an effort and hoped to make substantial progress towards this end in the first quarter of 2017.

**R5.3:** Although overall reporting is robust, TRS should consider shifting more regular compliance reporting responsibilities to the Chief Compliance Officer and moving the Chief Audit Executive towards assessing the effectiveness of the compliance program.
Broadly speaking, the role of a compliance function is to assist senior management and the Board in managing the compliance risks faced by a retirement system and providing assurance that such risks are being appropriately managed, while the role of an internal audit function is to provide separate assurance to the Board based on appropriate testing of compliance risks. While the current structure clearly works to ensure that TRS’ compliance risks are appropriately identified, addressed and reported to the TRS Board and/or its committees, a shift to a reporting structure that places the regular reporting responsibility on the CCO and refocuses Internal Audit on providing assurance to the TRS Board on compliance risk on a periodic basis may serve to strengthen both functions over the long term.
6. TRS’s current structure for investing in real asset investments compared to other potential investment methods

Activities completed:

The objective of this item was to review the current process TRS has established for approving and selecting investment partners and opportunities. The scope of the review covered: the program’s overall investing framework and approach; procedures and processes for sourcing, diligencing, and approving both managers and individual investments; activities associated with managing and monitoring existing investments; and the types of vehicles TRS uses to execute and implement investments. Key interviews included those with members of the Real Assets, Principal Investments, and Risk Management teams, along with consultants and selected managers. Primary reference materials included a detailed listing of real assets investments, the annual capital plan, bi-annual portfolio reviews, staff reports to the Board, guidelines and procedures, investment checklists, and sample due diligence outputs prepared by staff and consultants.

Standard of comparison:

This evaluation appropriately addresses the two main components of TRS’s real assets investment “structure” as being primarily related to: 1) process, including steps, decision points, activities, and documentation; or 2) mode, meaning the type of legal arrangement under which investments are executed and managed.

Process-Related Standards of Comparison

Any institutional investor, regardless of size or the relative reliance on in-house and consulting resources, would be expected to have an investment process that:

- Is stepwise, robust, internally consistent, documented, understood, and followed;
- Covers the full range of investment activities, from sourcing and pipeline development, through sequential due diligence phases, execution, monitoring, and exit;
- Incorporates appropriate risk management practices and metrics, including those related to diversification and concentration considerations;
- Is consistent with policies applicable at the plan-wide and asset class level; and
- Ideally embodies and reflects a unifying investment philosophy.

The exact configuration of the process, number and phasing of steps, roles and responsibilities of staff and consultants, and level and style of documentation will understandably and appropriately vary across different and even similar institutions according to needs and preferences.
Mode-Related Standards of Comparison

Institutional investors would typically be expected to rely on a combination of the modes for private markets investments described below, recognizing that the option set for any particular strategy or manager may not include all modes. Key differences among the modes relate to scope of manager’s investment discretion, customization of investment strategy, management and incentive fee levels, and governance terms.

- **“Standard” Commingled Fund** — These are established as a General Partnership (“GP”) led by the investment manager with multiple institutional and otherwise qualified Limited Partners (“LP”) committing capital to the stated strategy, with investment discretion given to the GP. The timing of an investor’s commitment means it may be made to a “blind pool” (i.e., no assets yet held), specific seed assets and blind future investments (some capital has been invested), or a specified, fixed set of assets. Partnership terms, including fees and governance rights, are typically set, with larger investors often given or able to negotiate more favorable terms.

- **Club Deal/Fund** — These vehicles are similar to the standard commingled fund, with key differences relating to the number of LPs, strategy definition/motivation, and terms. Club Funds tend to have fewer LPs, e.g., three to nine compared to a dozen to a hundred or more. They may have been formed by invitation only at the manager’s initiation, or as a customized strategy requested by several collaborating like-minded LPs. With a smaller set of LPs with relatively more important commitments, terms tend to be more LP-friendly than standard commingled funds.

- **Separately Managed Account (SMA)** — Also sometimes referred to as a “fund of one”, SMAs establish a manager-investor relationship segregated from other investors. The strategy may be unique to each SMA or represent a common approach offered across investors. The amount of investment discretion and other terms will be specific to each SMA, subject to customization and negotiation. Legally, SMAs can be established as a GP-LP relationship that insulates the investor from certain liabilities, similar to a commingled or club fund, or as a vehicle with fewer such liability limitations.

- **Direct Real Estate Investments** — Under the fund and account structures defined above, the investment vehicle is the formal owner of the asset(s), is independently managed, and the investor’s ownership is indirect and passive. Alternatively, an investor can make a direct investment as principal and be the controlling owner if/as necessary engage an entity to assume certain management and/or operating responsibilities under joint venture agreement or other arrangement. Principal investments typically provide investors with full discretion and favorable terms, including an assumed lower total fee structure than funds or SMAs, but require more expertise and resources from the investor to source, diligence, and manage compared to other vehicles.

- **Co-investments** — This mode most typically describes situations where investors in commingled funds make a larger investment in a specific asset than they otherwise would
have received as their pro-rata share of the fund’s investment. A manager may offer co-investment opportunities, for example, when a target asset’s acquisition would exceed a diversification limit for a fund, or otherwise impact desired portfolio construction goals. Such co-investments may be offered and managed under a variety of vehicles, including dedicated co-investment funds/accounts with a non-discretionary, opt-in/out, or fully discretionary basis. Co-investment may also refer to situations where an unaffiliated third party invests alongside a manager, fund, or account as a partner, with or without its own GP or manager intermediary. A main attraction of co-investments is the reduced fee structure, e.g., half of the typical management fee and carry in real estate, and even lower or zero fee/carry in other private markets asset classes. The main challenge of co-investments is the expedited diligence and decision period for LPs, which can be a matter of weeks, compared to months or years for funds or accounts.

- **Fund of Funds (FoF)** — These are typically commingled funds or SMAs that invest in commingled funds rather than individual assets or companies. A key benefit is streamlining or consolidating the target strategies under a single manager. An important detraction is the double layer of fees, with one layer charged by the underlying funds and the other by the FoF manager.

- **Secondaries** — This term most typically refers to investments in commingled funds that the investor purchases from an LP after the fund has closed to new investors, but can also more broadly refer to other modes acquired in this way. LPs generally offer secondaries either for portfolio rebalancing or raising cash, and LPs are interested in buying secondaries to fill a gap in their portfolio, tactically upsize an existing position, and/or to take advantage of an investment that is usually offered at a discount.

Variances across investors’ reliance on the available modes are explained by a variety of factors, including: institutional history; total assets under management; single investment sizing; annual number of investments targeted; absolute and relative levels of internal and external investment resources; staff and Board preferences; and overall level of experience. Specifically, access to and ability to execute investments using modes other than standard commingled funds is often directly related to an investor’s commitment size, professional capacity, and degree of sophistication.

**Findings:**

6.1. **TRS’s Real Assets process (which is substantially the same as for other external private markets) meets or exceeds the standards of comparison outlined above, and generally follows best practices for large institutional investors.**

Characteristics of the TRS process include:

- Planning, sourcing, diligence, approval, execution, monitoring, and reporting processes and requirements are documented, in the form of procedures and guidelines.

- Written guidelines represent a comprehensive combination of narrative, checklists, flow
charts, and other templates to support work flow and decision-making.

- Risk-related items, including policy requirements, are considered from an opportunity’s early stage, evaluated explicitly during diligence, and benefit from the Chief Risk Officer sitting on the Internal Investment Committee.

- Process outputs are tracked for completion, conformance, and electronically filed according to convention.

- Sample work products reflect rigorous and thoughtful analysis, presented at both a summary and detailed level.

- Communication within the Real Assets team appears frequent and well-functioning.

- The investment review and decision – making activities occurring at the Pre-IIC and IIC include the appropriate professionals and diligence documentation to support collective deliberations and investment recommendations.

- Across the interviewees, everyone understood the process, was fluent and accurate in describing the steps and associated activities, with excellent consistency.

- At a macro and micro level, the process implements the “Texas Way”.

6.2. TRS’s Real Assets program makes investments in multiple modes, with significant capital deployed through partnership arrangements that provide lower fees, better governance, and greater opportunities to earn alpha than relying only on commingled funds would provide.

One-third of the program’s exposure is through modes other than standard commingled funds, under “Principal Investments”, as shown below.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Number</th>
<th>Commitment</th>
<th>Remaining</th>
<th>NA</th>
<th>Exposure</th>
<th>% Exp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commingled Funds</td>
<td>121</td>
<td>$20,758.1</td>
<td>$5,511.8</td>
<td>$12,285.5</td>
<td>17,797.3</td>
<td>61%</td>
</tr>
<tr>
<td>Strategic Partner Funds</td>
<td>10</td>
<td>1,340.6</td>
<td>796.6</td>
<td>614.7</td>
<td>1,411.3</td>
<td>5%</td>
</tr>
<tr>
<td>Principal Investments</td>
<td>60</td>
<td>9,733.2</td>
<td>3,898.4</td>
<td>5,442.9</td>
<td>9,341.3</td>
<td>32%</td>
</tr>
<tr>
<td>Emerging Manager Funds</td>
<td>17</td>
<td>902.0</td>
<td>431.2</td>
<td>435.8</td>
<td>867.0</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>208</strong></td>
<td><strong>$32,733.9</strong></td>
<td><strong>$10,638</strong></td>
<td><strong>$18,778.9</strong></td>
<td><strong>$29,416.9</strong></td>
<td></td>
</tr>
</tbody>
</table>

TRS defines Principal Investments as outlined below [Source: Real Assets Report to the Board, June 2016].
TRS Review of Real Assets Investment Practices and Performance
Final Report

<table>
<thead>
<tr>
<th>Co-Investment (Alongside a Fund)</th>
<th>Direct (Two Types)</th>
<th>Single Limited Partnership (LP Fund)</th>
<th>Sidecar (Two Types)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What:</strong> A specific investment opportunity that is brought to TRS by an existing manager</td>
<td><strong>Direct:</strong> A specific investment that can be underwritten and evaluated immediately</td>
<td><strong>What:</strong> Fund created with a specific strategy to invest over an investment period. No pre-specified assets.</td>
<td><strong>Why:</strong> Fees and/or prome tie-fee are lower than main fund and negotiated in advance</td>
</tr>
<tr>
<td><strong>Why:</strong> Manager needs more capital than is available in the main fund (due to size, concentration, etc.)</td>
<td><strong>Why:</strong> Allows TRS to capitalize on a specific investment opportunity in real-time.</td>
<td><strong>Why:</strong> Create a vehicle to target a specific strategy and invest over a period of time.</td>
<td><strong>TRS Control:</strong> TRS has opt-out rights and more control over which deals are put into the sidecar</td>
</tr>
<tr>
<td>• TRS equity invests alongside main fund and GP serves as fiduciary of the co-investment vehicle</td>
<td><strong>With a Manager</strong></td>
<td>• Usually 100% TRS capital</td>
<td><strong>• TRS controls decision to invest in a specific investment alongside the fund</strong></td>
</tr>
<tr>
<td>• RA terms are usually negotiated as half (50% discount) compared to the main fund fee/promote. PE terms are “0%0%”</td>
<td><strong>• TRS underwrites the investment alongside manager</strong></td>
<td>• TRS has opt-out rights (negative control) and reviews each investment</td>
<td><strong>• Gives manager pre-committed co-investment capital for deals with short time-lines</strong></td>
</tr>
<tr>
<td>• Typically in/out on same timing &amp; terms as GP</td>
<td><strong>• Unlike a Co-Investment – TRS may have the ability to control hold period and exit decision</strong></td>
<td>• Can be open-ended and recycle capital</td>
<td><strong>Manager Controlled (New-PF):</strong> Manager has discretion for when to allocate sidecar capital to opportunities</td>
</tr>
<tr>
<td></td>
<td><strong>Without a Manager</strong></td>
<td>• Terms are market driven (but less than a commingled fund)</td>
<td><strong>• Purpose:</strong> Lower overall blended fee drag for TRS</td>
</tr>
<tr>
<td>• All capital comes from TRS</td>
<td><strong>• Unlike a Co-Investment – TRS has ability to control hold period and exit decision</strong></td>
<td>• TRS has ability to control hold period and exit decision</td>
<td></td>
</tr>
</tbody>
</table>

TRS makes significant use of principal (with a manager), co-investment, single LP, and sidecar modes as shown in the table below.

| Breakdown of Principal Investment Modes, As of 06/30/16, $M [Source, RE supplement file] |
|------------------------------------------|----------------|-----------------|-----------------|-----------------|
| **Mode**                             | **Number** | **Commitment** | **Remaining** | **Exposure** | **% Exp** |
| Principal (with a manager)            | 16          | $2,961.0       | $741.2         | $1,523.6       | 24%       |
| Co-invest                              | 13          | 1,775.8        | 558.5          | 1,211.7        | 19%       |
| Co-invest Fund (Ranger)               | 3           | 874.9          | 403.3          | 214.5          | 7%        |
| Single LP                              | 14          | 2,882.3        | 1,511.1        | 2,054.7        | 38%       |
| Sidecar                                | 14          | 1,239.1        | 684.2          | 438.4          | 12%       |
| **Total**                              | **60**      | **$9,733.2**   | **$3,898.4**   | **$5,442.9**   | **$9,341.3** |

TRS does not significantly rely on secondaries. Among the commingled funds, three commitments to existing funds were increased via secondary purchases, totaling $127.8 million, or 0.6% of commingled fund commitments, and 0.4% of total commitments. Several others were diligenced but not executed when the seller withdrew the offering. Staff would consider future secondary purchases, primarily with existing Premier List managers offered at meaningful discounts. This approach is consistent with TRS having a mature portfolio, well diversified by vintage year and other metrics.

TRS does not significantly rely on funds of funds, which is consistent with TRS’s status as a sophisticated, large, well-resourced investor. The few exceptions, including the vehicle managed by one consultant to make co-investments in amounts less than $50 million and two funds managed by
another consultant for emerging managers, are efficient and effective ways of accessing those types of investments.

TRS does not currently make direct real estate investments that are not securities without a manager, as it is not authorized to do so under its governing laws (see also under Item 7 of this report).

6.3. **TRS’s Real Assets program is well-designed to forge strong relationships with best-in-class managers and drive deal flow to co-investment/other modal opportunities with lower fees and tactical attractions.**

Under the Premier List system, managers are diligenced and certified at least six months in advance of recommending any particular investment with them. Staff review the Premier List twice a year to reconfirm or revise status. Per Executive/Senior Management direction, practice is to keep the total number roughly the same, so additions require subtractions. Medal colors—platinum (Strategic Partner Network managers), gold, silver, and bronze—further segment managers, largely based on future expected deal flow to future commitments, including principal and co-investments, in particular.

The system focuses staff and consultant time and attention on the most important relationships, and provides a strong signal to managers around TRS’s status as source of significant and potentially recurring capital.

Of the 54 current Premier List managers (40 invested and 14 non-invested), 26 offer strategies in core, value-added, and opportunistic. Among the 208 individual investments as of June 30, 2016, more than half (59%) of the commitments were to managers with three or more investments. TRS tracks its top 10 relationships, and in June 2016 reported that 44% of the portfolio’s total exposure was to those 10 managers. Among the managers with more than one investment, 14 held them in two different modes, 5 held three modes, and 3 held four modes.

**Opportunities for improvement:**

**R6.1:** **Expanding written guidelines to address selected portfolio review and diligence activities should be considered.**

Noted examples of areas for which additional documentation could be considered include around portfolio review activities and premier list system implementation. The team members generally have a common understanding in these areas and feel their implementation is internally consistent. However, without written definitions and guidelines it is difficult to confirm internal consistency with as much basis as may be desired in the future, within the RA portfolio and across other private markets.

**R6.2:** **The Principal Investing (PI) program should be expanded, as already contemplated by staff.**
As long as the PI program is documented to deliver additional alpha and offer access to attractive and unique opportunities, TRS should target PI commitments to bring the program above the roughly 30% representation currently held. To date, PI returns have been good, delivering 16% to 18% net, compared to 8% to 10% for other modes, and the RA team has already discussed a long-term target for principal investments of 30% to 35% of the portfolio. However, the June 2016 report only projected committing 25% of that year’s total to PI. Possible avenues to expanding the program besides the obvious ones of increasing the number and/or commitment sizes include adjusting the relative commitments to a main fund and a related PI, and exploring a more aggressive or structured deal flow approach with key managers.

**R6.3:** The PI program, or other approach, should be used as needed to “wrap” managers with multiple investments to replicate aspects of the Strategic Partner Network (“SPN”) and secure the best possible terms and deal flow.

The existing SPN managers were selected in part based on their ability to serve multiple asset classes. However, neither of the Trust’s two private SPN managers are among Real Assets’ top 10 relationships.

Understanding that the agreements with the current SPN managers restrict the Trust from engaging additional official SPN managers, formal and informal means should be explored to drive more favorable economic and governance terms under a “family plan” or “VIP” status with managers that do not already operate in such a fashion.

**R6.4:** TRS should consider whether additional mechanisms are necessary to support graduating Emerging Manager funds from that program to the Real Assets Premier List.

There can be a gap between the Emerging Manager (EM) program and the Premier List. Under the current practice of maintaining a manageable number of premier managers at the current level, a well-performing emerging manager cannot graduate from that program to the Real Assets Premier List without displacing an existing premier manager. This potential impediment to graduation would interrupt the relationship with the manager and limit the continuity of the EM program serving as a farm team for the portfolio. One structural solution would be to form a fund of graduated EM funds that would only take up one slot on the Real Assets premier list, managed by a consultant, for example. This approach is not dissimilar to the co-investment fund of funds already in place. TRS already is implementing non-structural solutions, including bi-annual portfolio reviews to identify and target EM managers that are candidates for graduation to the Real Asset’s program, but further enhancements might be possible.
7. Real asset investment strategies currently not employed by TRS that could be advantageous for the fund

Activities completed:

The objective of this scope item was to review the Real Asset Program’s permissible investment structures and to determine whether there are additional structures not currently utilized by the program. The review included a discussion with the Real Assets Team, functional heads of Private Equity and ENRI, consultants, as well as a review of the principal investment platform.

The IPS currently allows for the following private market structures: “investments in securities of any legally permissible investment vehicle, including Private Investment Funds, co-investments, secondary investments, externally managed separate accounts investing in securities, hybrid securities with characteristics of equity or debt, joint ventures, secondary market transactions, entity-level investing or other off-market investments, new and emerging managers, and opportunistic investments (e.g., investments in the management entity of a private markets investment firm or sponsor, public-to-private transactions, and the acquisition of business development company or investment trust assets)”. As detailed in this report, TRS is not authorized under its governing statutes to make direct real asset investments.

Scope Item 6 provided a detailed account of what the Real Assets program has done to date; this section will focus on the investment structures not employed.

Standard of comparison:

As mentioned in scope Item 6, institutional investors typically rely on a combination of investment structures across the private market asset classes. Considerations typically include the following factors.

- Governance – An institutional investor may have limitations on what structures they pursue based on structural, regulatory, legal, or functional considerations. The structures mentioned above range in sophistication and complexity but are primarily conducted through a managed vehicle where a manager acts as the fiduciary and actively manages the portfolio in a discretionary manner. In certain cases, institutional investors will negotiate further shareholder rights that can include opt-in rights for investments and access to non-voting Board seats; however, the manager is still the fiduciary with discretion “in a box” for the investor (e.g., Fund of one and Sidecar vehicles). Direct Investing in real estate assets removes the manager from the role as a fiduciary and requires the institutional investor to assume those obligations (e.g., execution, monitoring, active board representation, and exit decisions). Some institutional investors are not able to make control investments in real estate as a principal due to this fiduciary responsibility and potential agency concerns regarding Board representation.

- Portfolio and Risk Management – When an institutional investor makes a commitment to a fund or separately managed account, that vehicle has four to five years to be fully invested. The Manager can provide general guidance on investment type but the actual deployment
can vary. This is called “blind pool risk.” An institutional investor has limited ability to manage specific investment risks and exposure due to this blind pool feature. There are certain separately managed accounts that can proved less blind pool risk, or perhaps, an opt-in structure for the investor. There is more control associated with co-investments and direct real estate investments because an institutional investor can look through to the investments upon execution. This enables the investor more flexibility and discretion when considering portfolio and risk management across their programs.

- Pacing – Typically commingled structures can take four to five years to fully deploy committed capital. Secondary transactions can accelerate this pacing as investments can be made in vehicles that are fully invested. Co-investments and direct real estate investments can provide a quicker deployment of capital as the investments typically require the full capital commitment on financial closing.

- Fee Impact – Fee impact can be a material factor when comparing investment structures. Commingled vehicles (with a value-added or opportunistic strategy) typically have a 1.5% to 1.8% management fee on committed and invested capital and a 20% performance fee. These structures can have a fee impact of approximately 450 to 600 basis points on gross returns. Core investment vehicles typically have a management fee of 0.9% to 1.0% and have a lower fee impact. Co-investments and direct real estate investments are typically associated with a low or no fee structure. Separately managed accounts might fall between the former and latter with regards to fee impact. A sophisticated institutional investor can materially decrease the amount of fee impact experienced by accessing differentiated structures.

- Resource Requirement – Staffing and system resources are a factor when determining a suitable investment structure. Commingled structures require a robust due diligence process but can be managed by a moderate sized team with a modest back office system. However, co-investments and direct investments can require a significant amount of resources and technology to support and monitor investments.

**Findings:**

7.1. **There are two investment structures that have not been utilized, either at all or in a meaningful manner, by the Real Assets program: Secondary Transactions and Direct Real Estate Investments.**

- Secondary Transactions – There have been a few secondary transactions executed by the Real Assets team but it is not an area where the program has reached a meaningful exposure. Unlike other principal investment structures, the Real Assets Team explained that obtaining limited partner interests through the secondary market has been conducted on an opportunistic basis, but the team believes that this structure has not provided the opportunity to scale invested capital. This is a reasonable approach given the maturity of the Real Assets program.

- Direct Investments – The Real Assets program is not authorized under TRS’ governing laws to invest directly in real assets, even if the interests in the title-holding entities
are securities under Texas law. However, the Real Assets Team has been able to transact on other investment structures as referenced in Item 6.

7.2. **The Real Assets Team has been successful in deploying capital into quality opportunities across allowed investment structures.**

Although direct real estate investing has benefits, TRS has a principal investment program that can continue to be built out through allowed structures. Based on discussions with the Staff and consultants, there does not seem to be a meaningful issue with the Real Assets Team’s ability to reach the Trust’s target allocation and to produce a portfolio that matches the strategic goals of the program.

7.3. **There appears to be inconsistency with regard to direct investing across the Trust.**

There does not seem to be a general aversion to direct investments across the Trust based on governance, risk, or investment resources. Based on discussions with TRS Staff, the Private Equity Program has made direct investments in companies, defined as “securities” and the ENRI program has the ability to invest in mineral rights as it is specifically mentioned as an approved investment in legislation.

7.4. **Direct investing would seem to be a natural progression of the Real Asset Program’s principal investment platform.**

Although there are numerous benefits to direct investing (e.g., discretion, potential fee savings) there are only a small number of public institutional investors (i.e., Canadian Pension Funds, Australian Superannuation Funds, and Sovereign Wealth Funds) that have direct investing platforms. Challenges include the ability to fund the costs associated with bringing in the required professionals, retention and alignment, governance, systems, sunk cost treatment, and indeterminacy with regards to investment execution. TRS considers these direct investors as their peers but also understand the complexities of developing a direct platform.

**Opportunities for improvement:**

**R7.1: TRS should consider developing a cost/benefit analysis for direct investments in Real Assets.**

A strategic review of a direct investing platform could be advantageous as a costs versus benefits analysis would show any material benefits to the Program. The review could also provide a timeline and guidance on milestones for reaching scale. If prudently approached, the case for a direct investment program could be made and understood by all stakeholders. Ultimately, legislative approval would be needed.
8. Adequacy of the level of information TRS receives from partnerships, including information on fund, property level details, investment valuations, and fees via the TRS reporting template

Activities completed:

The objective of this item was to review the current reporting standards at TRS related to real asset partnerships and compare them with best practices across the industry. The scope of the review covered the systems in place at TRS with a focus on reporting requirements and data collection, electronic submissions and manual inputs, sufficiency reviews, reconciliation across data recipients, and access. Key interviews included those with members of the Operations and Performance teams, Real Asset investment team, the custodian, consultants, and selected managers. Primary reference materials included investment accounting policies and procedures, valuation guidelines, various reporting templates, process flow charts, and authorizations lists.

Standard of comparison:

This evaluation covered reports and notices issued by the investment managers in their own formats and templates according to promised schedules, as well as similar or additional information requested by TRS, its custodian, or consultants via custom templates, on parallel or special schedules. The evaluation also covered TRS's, the custodian’s, and the consultant’s systems for receiving and managing the information received from managers.

Reporting

It is expected that institutional investment managers submit the following types of information and documents according to the requirements of the partnership terms.

- Cash flow notices, including capital calls, distributions, management fees, expenses, carry where applicable, taxes, etc. are issued the required number of days in advance of cash transfers and in the required/expected level of detail.

- Quarterly and annual reports, including investor’s capital account statements, partnership financials, and investment update/detail are issued within the required number of days following the end of the quarter/year, with the required/expected level of detail, and audited as per the partnership terms (e.g., usually only annually).

- Performance data are expected to be included in the quarterly and annual reports, including gross and net figures, as IRR, time weighted returns, and/or multiples on invested capital as required and appropriate for the investment strategy and asset types.

- Valuation data are expected to be included in the quarterly and annual reports, although fresh valuations may only be provided on an annual, or longer basis, depending on the type of investment, market conditions, and partnership terms.
**Systems**

To receive, track, process, analyze, and prepare their own reports using manager-provided information, individually and collectively, the institutional investors, custodians, and consultants should have the following, as appropriate to their institutional roles and responsibilities and external service contracts.

- Effective systems, with good documentation in text and visual accompaniments (e.g., flow charts, etc.).
- Redundancy of systems and workflows.
- Multiple layers of approval for all cash flows—contributions, distributions, etc.
- Independent and coordinated reconciliations, for cash flows and performance calculations.
- Business continuity and disaster recovery plans and tools.
- Qualified teams with appropriate expertise and continuing education, preferably with meaningful history of working together.
- If requesting custom or additional information relative to the managers’ regular submissions, standardized data collection templates that are clean and easy for managers to fill out.
- Systems interfaces and “dashboards” that are optimized to the investment staff’s needs to monitor system inputs at the partnership level, and evaluate outputs at the asset, partnership, and portfolio level.

The exact configuration of the collective system is expected to be strongest bilaterally between the investor and its custodian, who typically keeps the book of record for the institution, but may also include a general consultant or asset class consultant that also keeps a book of record and interfaces with the investor, custodian, and managers.

**Findings:**

8.1. *Reporting by investment managers meets, and in some aspects, exceeds industry standards.*

The reporting processes and results include the following:

- Managers submit the required information in a timely manner in their regular format.
- Submissions go directly to TRS, the custodian bank, and the Real Assets consultant.
- Managers submit the same and additional information to the custodian bank quarterly, via the QDIF (Qualitative Data Interchange Format) reporting template, an Excel workbook.
- Managers submit the same and additional information to the Real Assets investment consultant quarterly via their web reporting portal, which supports electronic data entry by the manager, with automated upload to their data systems.
The regular and supplemental reporting provides information at the fund-level and property-level, including valuations and fees:

- Manager and fund information, including commitment, currency, investment period, fee rates, hurdles, and carried interest;
- Fund-level data includes, but is not limited to, beginning and ending NAV, cash flows in including fees and promote, return calculations (income, appreciation, total), detailed fee and expense reporting (QTD and YTD), and balance sheet items; and
- Asset-level data includes, but is not limited to, type, location, size, purchase date, percent ownership, gross and net asset value, leverage, performance metrics, building metrics (e.g., occupancy, rent, revenues, capex).

### 8.2. TRS documents reporting requirements in Side Letter conditions that memorialize reporting covered in partnership terms and impose additional specific and broad requirements.

These address reporting deadlines, asset and fund level information, and “such other information reasonably requested by the Investor or its advisors, consultants, or custodians...” In addition, they address providing such data in the format (e.g., Excel template, web portal, third-party software platform) as may be requested.

### 8.3. Individually and collectively, TRS, the custodian bank, and the Real Assets investment consultant systems are comprehensive, at or above industry standard, and sufficiently redundant.

Our observations include:

- Overall, the systems and workflows are solid and well documented.
- The team appears strong and has been in place for a number of years, which adds to efficiency, quick turnaround of projects, and repetition with data and outputs.
- Cash flow notices, capital account statements, managers’ quarterly/annual reports all go directly to TRS, the custodian bank, and the Real Assets investment consultant, so they each have fund and asset-level info, return, other key performance indicators.
- TRS, the custodian bank, and the Real Assets investment consultant each have appropriate QA/QC processes and procedures.
- Multiple layers of approval are performed for all contributions and distributions.
- Redundancy of systems and workflows internally and at the custodian bank is appropriate; using two systems as back-up allows data to be reconciled easily, and for two independent firms with the same workflows and historical information.
• Bilateral reconciliations occur so that all parties close quarters with the same data, and the custodian bank holds the book of record.

• Data collection is standardized: QDIF and ILPA-based (Institutional Limited Partners Association) templates are used for underlying data and fund-level financials and performance.

• The custodian bank uploads data to eFront, to provide the reporting/data dashboard for TRS staff.

8.4. **TRS plans to continue advocacy/participation in industry efforts toward standardization and detail.**

Two specific areas of recent and future enhancements (to be implemented by the end of 2016) are:

• Asset level data in TRS’ template (the Real Assets investment consultant and the custodian bank have been collecting); and

• Fee detail/breakout: management, expenses, incentive fees are being added to QDIF.

**Opportunities for improvement:**

**R8.1:** *TRS should pursue greater standardization of data collection and templates to improve efficiency.*

There is a balance to strike between custom, institutional-specific data templates and the implications for accuracy and resource burden on the managers. The more different templates a manager must populate, the greater potential for accuracy and compliance issues. Industry wide, the choice should be leaning towards the ILPA generally for private market investments, and to another recognized body specific to real estate if one develops.

**R8.2:** *TRS should consider conducting fee audits on a partial-portfolio rolling basis.*

Management fee reconciliations are easy with respect to data availability and calculation, and can be maintained with a small team on a quarterly basis. In contrast, recalculating carry is very extensive work, and takes a well-trained employee, preferably with a CPA distinction. Additionally, detailed enough information for carry audits may not be available from all GPs. For these reasons, carry audits could focus only on the most significant payments.

**R8.3:** *TRS should consider performing valuation audits on rolling basis, and/or independent valuations should be required/requested for selected investments.*

TRS appears to generally accept the valuation methodology and frequency offered by the managers. These may have been improved upon initial terms, through TRS and other LP’s negotiations of the LPA
(Limited Partner Agreement) and side letter requirements. TRS reasonably assumes that a partnership’s auditor will examine the valuation methods and results for reasonableness. Some LPs are moving toward trying to make the valuations more frequent, rigorous, or transparent. Examples include LPA provisions that require managers to engage annual independent valuations (where not otherwise occurring), or that allow LPs to request an independent valuation with majority vote at the partnership’s expense.
9. Adequacy of the reporting of investing activities/results of TRS’s investments in real assets to executive management and the Board

**Activities completed:**

The overview of activities included earlier in this report encompasses the activities relevant to this topic. Of particular relevance to this topic of review are the samples of various performance and risk reports going to the trustees, both at meetings and between meetings, Board minutes, sample audit reports, sample compliance reports and Transparency Reports. Interviews that were of particular importance were those with trustees, the Deputy CIO, Chief Audit Executive, Chief Compliance Officer, Executive Director, Chief Risk Officer and the RA and general consultants.

**Standard of comparison:**

Reporting of investment activity and results to a governing board of an institutional investor should inform the trustees that their policies are being implemented and the outcomes of that implementation; provide a comprehensive picture of the program (activities, outcomes and risks); be subject to independent verification; be manageable for the users; and delivered in a time frame that makes the reports useful. Boiling this down to very brief descriptors, the reporting should be relevant, complete, reliable, digestible and timely.

Reference is made to these factors in the analysis that follows. (Note that aspects of reporting performance, risks and compliance are examined with more granularity in items 3, 4 and 5 of this report.)

**Findings:**

**9.1. Reporting to executive management and the Board of TRS on real assets activities and performance provides the comprehensive information needed to determine that the Board’s policies are being implemented and the results of that implementation.**

As a starting point it is noted that the TRS Investment Policy Statement (IPS) contains an array of reporting requirements. Likewise, the Bylaws of the Board delineate extensive responsibility for the Audit, Risk Management and Investment Management Committees of the Board to receive reports from staff and others. Topics include: performance metrics; risk analysis; strategies; planned, completed and ongoing investments; compliance issues; and audits. As described in Item 2 earlier in this report, these requirements create a robust information flow that covers the key policy, performance and risk metrics.

A review of actual reports delivered confirms that the content of the reports is consistent with the regimen mandated by the policy documents. Submission of report documents is frequently followed or supplemented by in person presentations, which allow for elaboration and clarification. A range of individuals appear before the Board or its committees as part of this exercise, including the CIO, RA staff, the Chief Risk Officer, the CAE and CCO. The Board’s general investment consultant attends
Board meetings and the RA consultant attends at least one meeting per year, making them available to trustees to comment on or supplement information received.

It is important, also, to make note of the variety of informal information flow that occurs between the IMD and executive management and trustees. The executive director attends meetings of the IIC, reviews and discusses Board meeting materials with the IMD in advance and has routine interactions with the CIO and RA staff. Board and committee chairs have periodic contact with IMD staff concerning ongoing activities including within the RA portfolio. It is customary for the CIO and Deputy CIO to brief individual trustees in person in advance of Board meetings. All of this informal contact helps assure the quality of information flow.

9.2. Reporting to executive management and the Board on real assets includes the multiple inputs and third party reviews necessary to provide independent oversight.

The matter of independent oversight is addressed in Item 2 above, and the comments there are applicable to reporting to executive management and the Board. A few supplemental observations are relevant also.

The custodial bank for TRS also serves as its accounting and investment book of record. As a consequence, the data for reporting on investments is sourced through the custodian. That is true also for matters such as fee and expense reporting which are important considerations in private markets investing, such as the RA portfolio. TRS, like a number of institutional investors, is obtaining greater detail and clarity in the information received from asset managers concerning costs and fees. As clarity is gained the information is included in Board reporting.

9.3. Reporting to executive management and the Board on real assets is provided in useful formats and a timely manner.

Review of the various reports provided to the Board shows them to be understandable and reasonably concise. The schedule for providing performance, risk, strategy and other reports seems sufficient to provide a timely flow of information. In addition, the relatively frequent informal contact among the various parties provides opportunity for interim communication of information when indicated.

The annual report from RA on the portfolio is a useful tool in providing an overview and longer term view of the portfolio, its strategy and the RA team itself. That report, of course, does not serve as a sole source of reporting. Of necessity the amount of information going to trustees is considerable, especially in light of the fact that a number of trustees come to the Board as financial lay-persons, and all trustees serve in part-time volunteer capacity. Given the complexity of the operation and the amount of information provided, it naturally takes even trustees with very strong financial backgrounds some time to become fully conversant with the program. Any tool to help hasten that process would be positive.
Opportunities for improvement:

   R9.1: TRS should consider whether trustee ability to use and comprehend the various information provided would be enhanced by developing a map, or guide, to the various sources of information and their purpose as a part of trustee training or in a manual.

One approach that TRS could consider, with respect to RA and perhaps other areas, is the preparation of a sort of guide for trustees on the various reports and the key items of information and the purpose of those items. While exposure to that guide during the initial orientation of trustees would likely be too early, it could be made a part of ongoing training or a trustee manual. It may help trustees more quickly focus on keys to oversight, and may help the preparers of reports identify for themselves what is critical and what is not, leading to better focused reporting.
Implementation Considerations

All of the detailed recommendations included in this report are listed on the following page, along with the FAS team’s assessment of:

- Priority (Critical, Important or Leading Practice)
- Degree of difficulty (Difficult, Medium, or Easy to Accomplish)
- Resources required (Low, Medium or High)
- Whether or not Board support is required (Yes or No)
- Whether enabling legislation is needed (Yes or No) Several comments are also noted, as appropriate.

In summary, it is worth noting that we do not view any of the recommendations as critical to the success of TRS. All of the recommendations are intended to offer suggestions for improvement, but we did not identify any critically-needed changes to the Real Assets program.
# TRS Review of Real Assets Investment Practices and Performance
## Final Report

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Critical vs Important vs Leading Practice</th>
<th>Difficult vs Medium vs Easy to Accomplish</th>
<th>Resources Required: Low / Medium / High</th>
<th>Board Support Needed</th>
<th>Enabling Legislation Needed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1.1: A specific Real Assets objective for inflation hedging or linkage should be added to the IPS.</td>
<td>Leading</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>R1.2: TRS should consider implementing a NCREIF ODCE plus premium approach to establishing a benchmark that matches the current portfolio construction with regard to risk.</td>
<td>Important</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>R2.1: TRS should consider whether, for clarity and completeness, a reference to inflation protection should be included in Article 5.1 of the IPS.</td>
<td>Leading Practice</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td>Overlaps with R1.1</td>
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<tr>
<td>R2.2: The TRS staff should provide the Board the annual capital plan for the Real Assets portfolio as soon as it is final each year and include an update on the capital plan with each quarterly Transparency Report.</td>
<td>Leading Practice</td>
<td>Easy</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>R2.3: TRS should include in Appendix B of the IPS a limit on the total Real Assets commitments that can be made in a single year.</td>
<td>Important</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>R3.1: TRS should consider a review of the real assets benchmark. An ideal benchmark would encompass the global nature of the program, exposure to non-core real estate, and the allocation to various property types.</td>
<td>Important</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td>Overlaps with R1.2</td>
</tr>
<tr>
<td>R4.1: TRS should consider a stated limit to the use of leverage.</td>
<td>Leading</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>R4.2: TRS should consider hedging foreign currency exposure.</td>
<td>Important</td>
<td>Medium</td>
<td>Medium</td>
<td>No</td>
<td>No</td>
<td></td>
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<td>R5.1: The Board should consider adopting a stand-alone Compliance Policy.</td>
<td>Leading</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>R5.2: TRS should consider mapping the compliance responsibilities and functions of the responsible areas so as to provide a system-wide view of compliance activities.</td>
<td>Leading Practice</td>
<td>Easy</td>
<td>Low</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>R5.3 Although overall reporting is robust, TRS should consider shifting more regular compliance reporting responsibilities to the Chief Compliance Officer and moving the Chief Audit Executive towards assessing the effectiveness of the compliance program.</td>
<td>Leading Practice</td>
<td>Easy</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>R6.1: Expanding written guidelines to address selected portfolio review and diligence activities should be considered.</td>
<td>Leading Practice</td>
<td>Medium</td>
<td>Low</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>R6.2: The Principal Investing (PI) program should be expanded, as already contemplated by</td>
<td>Important</td>
<td>Medium</td>
<td>Medium</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>R6.3: The PI program, or other approach, should be used as needed to “wrap” managers with multiple investments to replicate aspects of the Strategic Partner Network (“SPN”) and secure the best possible terms and deal flow.</td>
<td>Important</td>
<td>Medium</td>
<td>Medium</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>R6.4: TRS should consider whether additional mechanisms are necessary to support graduating Emerging Manager funds from that program to the Real Assets Premier List.</td>
<td>Important</td>
<td>Medium</td>
<td>Medium</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>R7.1: TRS should consider developing a cost/benefit analysis for direct investments in Real Assets.</td>
<td>Important</td>
<td>Difficult</td>
<td>Low</td>
<td>Yes</td>
<td>Ultimately</td>
<td></td>
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<tr>
<td>R8.1: TRS should pursue greater standardization of data collection and templates to improve efficiency.</td>
<td>Important</td>
<td>Medium</td>
<td>Low</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>R8.2: TRS should consider conducting fee audits on a partial-portfolio rolling basis.</td>
<td>Important</td>
<td>Medium</td>
<td>Medium</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>R8.3: TRS should consider performing valuation audits on rolling basis, and/or independent valuations should be required/requested for selected investments.</td>
<td>Important</td>
<td>Medium</td>
<td>Medium</td>
<td>No</td>
<td>No</td>
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<tr>
<td>R9.1: TRS should consider whether trustee ability to use and comprehend the various information provided would be enhanced by developing a map, or guide, to the various sources of information and their purpose as a part of trustee training or in a manual.</td>
<td>Leading Practice</td>
<td>Easy</td>
<td>Low</td>
<td>No</td>
<td>No</td>
<td></td>
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</table>
Appendix 1 – List of Acronyms Used in this Report

CAE - Chief Audit Executive
CalPERS - California Public Employees’ Retirement System
CCO - Chief Compliance Officer
CIO - Chief Investment Officer
CPA - Certified Public Accountant
CPI - Consumer Price Index
EM - Emerging Manager
ENR - Energy and Natural Resources
ENRI - Energy, Natural Resources and Infrastructure
ESG - Environmental, Social and Governance
FAS - Funston Advisory Services LLC
FoF - Fund of Funds
FTSE EPRA/NAREIT - Financial Times Stock Exchange European Public Real Estate Association/ National Association of Real Estate Investment Trusts
GP - General Partner
IA - Internal Audit
IIC - Internal Investment Committee
ILPA - Institutional Limited Partners Association
IMD - Investment Management Division
IPD - Investment Property Databank
IPS - Investment Policy Statement
IRR - Internal Rate of Return
LP - Limited Partner
LPA - Limited Partner Agreement
NAV - Net Asset Value
NCREIF CEVA - National Council of Real Estate Investment Fiduciaries – Closed End Value Add
NCREIF ODCE - National Council of Real Estate Investment Fiduciaries – Open-End Diversified Core
TRS Review of Real Assets Investment Practices and Performance
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Equity
NPI - National Property Index
PI - Principal Investing
QA/QC - Quality Assurance/Quality Control
QDIF - Qualitative Data Interchange Format
QTD - Quarter-to-Date
RA - Real Assets
SAA - Strategic Asset Allocation
SAO - State Auditor’s Office
SMD - Senior Managing Director
SPN - Strategic Partner Network
SWIB - State of Wisconsin Investment Board
TRS - Teacher Retirement System
VaR - Value at Risk
YTD - Year-to-Date
Appendix 2 – Project Team Biographies

Core Project Team:

Lisa Bacon, CAIA

Lisa Bacon joined Meketa Investment Group in 2014 and has been supporting public and private investments in natural resources and related infrastructure for 25 years. A Senior Vice President of the firm, she works in the Private Markets Group specializing in real assets. She performs due diligence of private market opportunities, maintains and establishes new relationships with private market firms, reports on private market investments and contributes to the firm’s client service efforts.

Prior to joining the firm, for two and a half years Lisa was a Real Return Investment Analyst for the New Mexico State Investment Council (NMSIC), which manages the State’s $20 billion Land Grant and Severance Tax Permanent Funds. While at NMSIC, she managed the real asset and real estate portfolios, including: evaluating existing investments and managers; monitoring portfolio performance and compliance; diligencing new managers and strategies, and shepherding new investments through the review, approval, and execution process. For the dozen years before joining NMSIC, Lisa was a Principal Technologist at CH2M Hill, a global firm providing full-service engineering, consulting, design-build, operations, and program management services in the energy, environmental, nuclear, transportation, and water sectors. Lisa was aligned with the firm’s Water Business Group and provided consulting services on projects involving water resources, ecosystem management, water and wastewater infrastructure, and utility management. For a previous firm, Lisa provided consulting services to federal and state agencies, including U.S. EPA and the U.S. Army Corps of Engineers. She also worked as an analyst for the Maryland General Assembly and the U.S. House of Representatives.

Lisa received a Master of Science in Finance with honors from Pace University’s Lubin School of Business, a Master of Public Policy from the University of California at Berkeley, and a Bachelor of Arts, cum laude, from Duke University. She holds the Chartered Alternative Investment Analyst (CAIA) designation and is a member of the CAIA Association.

Keith Bozarth

Keith S. Bozarth retired as Executive Director of the State of Wisconsin Investment Board (SWIB) in June 2012. Since then he has served as a senior advisor on the FAS team for the NYS CRF, Indiana PERS, SERS of Ohio, and South Carolina RSIC engagements.

During his tenure at SWIB, he successfully led a number of key initiatives:

- Modernization of Wisconsin law governing SWIB investments, providing full “prudent investor” authority and providing trustees with full control of SWIB budget and staff positions;
- Thirty percent increase in staffing at SWIB, which facilitated as increase in internal management from 20% of assets to over 50%, resulting in net cost savings;
- Review of the actuarial assumptions used for investment return and wage growth, resulting in significant adjustment to both;
- Implementation of a cost attribution system, assigning cost to individual portfolios, and a revised incentive program to reflect full “net return” calculation;
- Revised incentive program to reflect market for comparable operations; and
- Implementation of an enterprise risk management function for SWIB.

Before joining SWIB, Keith was CEO of the Orange County Employees Retirement System in California. His experience working with public pension funds began in 1992 and also includes the Teachers’ Retirement System of Illinois and both the State Employees’ and Public School Retirement systems in Missouri. He has served 11 years in a CEO role with oversight of investment, benefit and actuarial funding plans. In addition, he spent five years providing counsel to the Missouri section 457 deferred compensation plan and served one term as a member of the oversight board for the plan. In total, he has nearly 25 years involved in deferred compensation or pension issues. He has overseen asset-liability studies at four different public funds, working with a range of consultants and actuaries. Keith is a well-known figure among the pension fund community and has regularly published and presented.

Keith holds a bachelor’s degree and a J.D. degree, both from the University of Missouri-Columbia. He also was awarded the Retirement Plans Associate designation from the International Foundation of Employee Benefit Plans (joint program with the Wharton School).

**Christy Gahr**

Christy Gahr joined Meketa Investment Group in 2008 and is a Senior Vice President of the firm. She works in the Private Markets Group where she focuses on investments in real estate and private equity. Christy has been an integral part of Meketa’s overall private market efforts, but more specifically the development of the firm’s real estate programs.

Christy is focused predominantly on primary fund due diligence and most recently has focused on European opportunities out of the Meketa London office. Prior to joining Meketa Investment Group, Christy was employed at John Hancock Financial Services as a Staff Accountant. She graduated from Northeastern University with a bachelor’s degree in Finance.

**Randy Miller**

Randall (Randy) W. Miller has been a Principal with Funston Advisory Services LLC since its founding in 2010. He has been a leader of our fiduciary and operations reviews and is an expert in public retirement system governance. He also has led Board workshops with the Ohio Police & Fire Pension Plan and the Oregon College Savings Plan and authored several white papers on public retirement system governance. He has extensive experience in planning and conducting complex reviews and
improvement programs in large organizations.

Randy recently concluded his role as project manager on the New York State Common Retirement Fund review and previously was day-to-day project manager for our New York City Bureau of Asset Management study. He was part of the FAS team which recently assisted the Los Angeles County Employees Retirement Association (LACERA) in improving the effectiveness of the Board of Investments, and recently completed his involvement in a feasibility study for internal management with the Indiana Public Retirement System (INPRS). He previously led the benchmarking process for our South Carolina Peba and RSIC, New York State CRF and SERS of Ohio engagements. He was also recently the lead consultant on an engagement for the Office of the Oregon State Treasurer examining Oregon’s pension investment governance structure, and also was actively involved in three projects at CalPERS which: 1) developed Board governance reforms; 2) developed their enterprise risk management program; and 3) assessed and developed strategies for improving stakeholder relations. He led the CalPERS governance benchmarking, a critical part of the governance reforms review, and co-led the governance structure benchmarking for the Oregon project. He has extensive experience in operations analysis and planning, developing and directing large-scale improvement programs.

Randy retired from Deloitte Consulting LLP in February 2010 after 27 years of service, where he most recently led Mergers & Acquisitions Integration Services to manufacturing industry clients. He has significant international consulting experience, led Deloitte’s global automotive industry consulting practice, and was based in Germany with Deloitte from 1997-2003, where he led Deloitte Consulting DACH (Germany, Austria, Switzerland) for two years. He specialized in planning and implementation of mergers, acquisitions and divestitures; market and supply chain strategy; and cost reduction/operations improvements.

Randy has led a variety of benchmarking studies, including board governance, investment operations, overhead cost structure, information technology strategies, and business transformation strategies. Randy received an A.B. degree from Dartmouth College with a major in Engineering Sciences. He also received a B.E. from the Thayer School of Engineering and an M.B.A. from the Amos Tuck School of Business, both also at Dartmouth. Prior to Deloitte, Randy was a car product planner at Ford Motor Company.

**Christopher P. Tehranian**

Chris Tehranian joined Meketa Investment Group in 2007. A Principal of the firm, is responsible for managing the firm’s infrastructure and real assets private market practice. He focuses on performing due diligence of real asset opportunities, maintaining and establishing new relationships, and reporting. In addition, he assists clients with the development of investment policies, strategic planning, and program implementation and is a member of the Meketa Environmental, Social and Governance (ESG) Committee. He sits on a variety of fund advisory boards, and speaks at numerous industry events.

Prior to joining Meketa, he worked in capital budgeting, allocation, and financial management for the Gulf Power Company, a subsidiary of the Southern Company. Jess was previously employed as a
portfolio analyst at Franklin Templeton Investments, and as an investment analyst at Segal Advisors. He received a Master of Science in Finance from Boston College and a BS in Finance and International Economics from the University of Florida.

**Christopher W. Waddell**

Chris Waddell joined Olson Hagel & Fishburn, LLP as a Senior Attorney in December 2008, where he heads the firm’s Public Retirement Law practice. He previously served as General Counsel for two California public retirement systems; first at the California State Teachers’ Retirement System (CalSTRS), the second largest public pension fund in the country, and later at the San Diego City Employees’ Retirement System (SDCERS). He has extensive experience in advising public pension trustees and staff on fiduciary obligations, plan funding and administration, and governance best practices. Chris was part of the FAS team which conducted a detailed review of the New York City Bureau of Asset Management, where he led the assessment of contracting and corporate governance and participated in the reviews of compliance, investment strategy, administration, and financial reporting.

Chris currently serves as the outside General Counsel to the San Luis Obispo County Pension Trust, fiduciary counsel to SDCERS, and advises CalSTRS and several other California public pension systems as outside counsel on pension and fiduciary law issues involving benefits administration and/or interpretation as well as plan funding and governance questions. He also provides training in these areas as well as on open meeting and public records laws.

Prior to joining CalSTRS, Chris was the Chief Counsel for the California Department of Finance and before that was the Chief Counsel for the California Department of Personnel Administration. During a portion of his tenure at Finance, he served as the Department’s representative on the CalSTRS Board. At both departments, he worked on a number of significant pension issues affecting CalSTRS and CalPERS.

Chris is the author of a study released in 2009 by the American Federation of State, County and Municipal Employees entitled “Enhancing Public Retiree Plan Security: Best Practice Policies for Trustees and Pension Systems.” He has served as a Corporate Governance Fellow at the Stanford Law School and was a Co-Director of the Stanford Fiduciary College. Chris was the lead author for the Clapman 2.0 Report, an update and expansion of the original 2007 Clapman report on pension fund governance best practices, issued by the Committee on Fund Governance of the Stanford Institutional Investors’ Forum. He also authored a chapter entitled “Fulfilling Fiduciary Duties in an Imperfect World—Governance Recommendations from the Stanford Institutional Forum” for the Cambridge Handbook of Institutional Investment and Fiduciary Duty, published in 2014 by Cambridge Press.

Chris is a member of the National Association of Public Pension Plan Attorneys (NAPPA) and has served as the Chair of the Investment Section and Co-Chair of the Fiduciary Section. He has spoken frequently on pension governance, fiduciary law, conflicts of interest, and securities litigation issues.
before the National Council on Teacher Retirement, NAPPA, the California Association of Public Retirement Systems, and the Stanford Fiduciary College. He has also testified before on pension issues before the California Legislature, the San Diego City Council, and the San Diego Charter Revision Commission.

Chris earned his Bachelor’s degree in Political Science/Public Service from the University of California at Davis and his law degree from the McGeorge School of Law, where he was a writer and editor for the Pacific Law Journal. He is a member of the State Bar of California.

Senior Advisors

Rick Funston

Frederick (Rick) Funston is the Managing Partner of Funston Advisory Services LLC, focusing on governance, strategy and risk intelligence. In 2001, he created the concept of risk intelligence for both value creation and value protection. He is a frequent public speaker both domestically and internationally and he is the principal author of Surviving and Thriving in Uncertainty: Creating The Risk Intelligent Enterprise™, published by John Wiley & Sons in April, 2010. This book is specifically targeted at the governance and risk oversight needs of boards and executives in both public and private sectors.

Rick has recently led the Fiduciary and Conflict of Interest Review of the New York State Common Retirement Fund and the Management and Operations Study and Best Practice Review of the New York City Bureau of Asset Management (BAM) for the New York City Comptroller. He previously led the Fiduciary Performance Audit of the South Carolina Public Employee Benefit Authority for the Office of the Inspector General. He also led Fiduciary Audits for the South Carolina Retirement System Investment Commission (RSIC) and the School Employees Retirement System (SERS) of Ohio, where the emphasis was on governance, policies and procedures in the investment operations and identifying improvement opportunities. He led the 2013 Fiduciary and Conflict of Interest Review for the New York State Common Retirement Fund (NYS CRF), a review of governance structure alternatives for the Oregon Investment Council, and Board Governance Improvement, Enterprise Risk Management, and Stakeholder Relations projects at CalPERS.

He has provided board and executive education for CalPERS, the State Universities Retirement System of Illinois, Fairfax County Retirement System, Indiana Public Retirement System, Maryland State Retirement and Pension System, and the Washington State and State of Wisconsin Investment Boards.

Rick retired from Deloitte & Touche LLP in May 2010 and formed Funston Advisory Services LLC. Prior to his retirement, he was the National Practice leader for Deloitte’s Governance and Risk Oversight Services. In that capacity, he served many of Deloitte’s largest domestic and global clients and was responsible for the thought leadership that currently underpins Deloitte’s globally pre-eminent position in risk intelligence.

He has over forty years’ experience in both not-for-profit and for-profit sectors. Before joining Deloitte, Rick was the CEO of Continuous Improvement Services Inc. He began his career in the public sector
consulting on strategy and operations, organization and leadership development, performance management, program evaluation and survey research.

Rick has been a guest lecturer at the Yale School of Management and Princeton University. He also served on the Board of Visitors for the Oakland University School of Business Administration from 2009-2011 and is an Adjunct Professor for the executive MBA program. He was awarded a B.A. from York University in Ontario and an M.S.W. from Tulane University.

**John A. Haggerty, CFA**

John Haggerty joined Meketa Investment Group in 1996 and has been in the financial services industry since 1993. He carries consulting, management, and research responsibilities and chairs the firm’s Private Markets Investment Committee (PMIC), which has overseen the deployment of over $14 billion in client commitments since 2000. The PMIC governs client portfolio management, commitment pacing, strategic policy, and approval of individual investments. John is also a member of the firm’s Private Equity, Private Debt, Real Estate, and Real Assets Investment Committees.

John became a Chartered Financial Analyst in 1998 and is a member of the CFA Institute and the Boston Security Analysts Society. He serves on the Advisory Board of numerous buyout and venture capital limited partnerships.

John held previous positions at IBC/Financial Data and The Boston Company. He is a graduate of Cornell University.

**Jon Lukomnik**

Jon Lukomnik led the evaluation of hiring and firing of external managers and consultants and due diligence and monitoring procedures during the NYC BAM, SERS of Ohio, NYS CRF and South Carolina RSIC reviews. He was also a senior advisor to the Cutter/FAS team which conducted a feasibility study for internal investment management at Indiana PERS. Jon is managing partner of Sinclair Capital L.L.C., a strategic consultancy to corporations, institutional investors and the investment management industry. He has provided risk management, product development, due diligence, fund selection and portfolio construction services to various institutional investors. Clients have included Nikko Asset Management, Legg Mason, SBLI Mutual Life Insurance Company, and NS Capital. Jon is a trustee for the Van Eck mutual fund complex and its related European UCITS funds. He has also been a director for various public companies, private companies, not-for-profit corporations and litigation trusts.

Jon was deputy comptroller for pensions for the City of New York in the mid-1990’s, where he was the designated investment advisor for the City’s five defined benefit pension funds and was investment advisor for defined benefit plans totaling $80 billion in assets, as well as the City’s own treasury. In total, he has served as investment advisor or trustee for more than $100 billion in assets under management for various trusts, pension funds, endowments and asset management companies.
Over the course of his career, he has conducted more than 1,000 due diligence and external asset manager monitoring meetings. Jon has been named by the National Association of Corporate Directors as one of the 100 Most Influential People in America for Corporate Governance three times. He was the International Corporate Governance Network’s 2013 honoree for "excellence in corporate governance." He is a member of the Standing Advisory Group of the Public Company Accounting Oversight Board (PCAOB) for a three-year term beginning in 2015.

A frequent contributor to both academic and practitioner publications, his new book, *What They Do With Your Money: How the Financial System Fails Us and How to Fix* (Yale University Press, May, 2016), co-authored with Stephen Davis and David Pitt-Watson, has been praised by *The Economist* and *Financial Times*. Jon also co-authored the award-winning book, *The New Capitalists: How Citizen Investors Are Reshaping the Corporate Agenda* (Harvard Business School Press, October 2006), wrote chapters in *The Handbook of Corporate Governance* (Wiley, May 2016) and co-wrote a chapter in *Corporate Governance in the Wake of the Financial Crisis* (United Nations, 2010) and writes a monthly column for *Compliance Week*. 
TAB 17
Moving Forward
to Better Serve Our Members

Private Equity Fees and Expense Transparency
Amy Barrett, Eric Lang, Neil Randall, TRS;
Lorelei Graye, Leodoran Financial; Jennifer Choi, Institutional Limited Partners Association; Paul Yett, Hamilton Lane; Suresh Krishnamurthy, State Street
• Introduction

• Panel Discussion
  o History and issues around private equity fees and expense transparency
  o Industry involvement and perspective
  o TRS Initiatives
Comprehensive Annual Financial Report

- Revisited disclosures given increased reliability of information
- For FY 16, disclosed the following by asset class:
  - Assets Under Management
  - Fees paid from trust (management and performance)
  - Fees netted with returns (management and performance)
- Disclosures consistent with GFOA and GASB guidance

Audits

- Validating fees at 2 funds as a pilot project
- Report results to Audit Committee in FY17 (June or September)
Private Equity Fees and Expense Transparency

PE Overview

- All TRS returns are reported net of fees and expenses
- Common PE waterfalls require the GP to pay back fees prior to earning their carried interest
- TRS is leading LP in this area; as we gain momentum in transparency - the whole industry benefits
- TRS Private Equity performance has been exceptional:

<table>
<thead>
<tr>
<th></th>
<th>3-Year Return</th>
<th>5-Year Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Equity IRR</td>
<td>13.1%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Private Equity TWR</td>
<td>12.6%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Private Equity Benchmark</td>
<td>10.1%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Excess Return</td>
<td>2.5%</td>
<td>3.6%</td>
</tr>
<tr>
<td>TUCS Peer Comparison</td>
<td>16th</td>
<td>10th</td>
</tr>
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</table>

Source: IRR (State Street as of 6/30/16); TWR (State Street as of 9/30/16)
### Private Equity Fees and Expense Transparency

#### LP Reporting Challenges

- Lack of Consistent Detail in Financials
- PDF Format

---

**Quarterly Statement Examples**

<table>
<thead>
<tr>
<th>Example A</th>
<th>Example B</th>
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</thead>
<tbody>
<tr>
<td>% of Capital</td>
<td>Statement of Changes in Capital Account from October 1, 2015 to December 31, 2015</td>
</tr>
<tr>
<td>Partner %</td>
<td>Capital Commitment</td>
</tr>
<tr>
<td>Total Capital Commitment</td>
<td>Capital account balance at October 1, 2015, at cost</td>
</tr>
<tr>
<td>Capital Contributed to Date (includes transfers)</td>
<td>Net operating income (loss)</td>
</tr>
<tr>
<td>Remaining Commitment</td>
<td>Partnership distributions</td>
</tr>
</tbody>
</table>

**Opening Capital Balance**

- Contributions during the period
- Contributions receivable
- Distributions during the period
- Transfer of interest
- Syndication Costs

**Investment Results**

- Interest Income
- Management Fees
- Management Fee Offset
- Other Expenses
- Realized Gain/(Loss)
- Deemed Gain/(Loss)
- Change in Unrealized Gain/Loss;
- Net Investment Results
- Unrealized loss on cash escrow
- Equity interest in net operating income and realized gain from investees
- Equity interest in change in unrealized depreciation from investees
- Incentive Allocation
- Closing Capital Balance

**Change in net unrealized appreciation/depreciation of investments**
Private Equity Fees and Expense Transparency
Fee Reporting: Gaining Global Awareness

• CEM Benchmarking white paper
  o Proposed a report that would highlight the struggle to be identify fees of PE investments
  o Generated to be a “rousing call to action”; the industry needs standardization

• LP Response
  o Strong positive reaction from LPs around the globe
  o Many pensions, including TRS, wanted to collaborate
  o ILPA reached out as our path forward for industry change
Organizational Attitudes

“The lack of reporting consistency among GPs hinders our ability to adequately monitor our PE plan costs.”

<table>
<thead>
<tr>
<th>Change in Concern Levels (Past 2 Years)</th>
<th>Public Pensions</th>
<th>All Other LPs</th>
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</thead>
<tbody>
<tr>
<td>Increased significantly</td>
<td>62%</td>
<td>60%</td>
</tr>
<tr>
<td>Increased moderately</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Concern increased **significantly** for 44% of large plans (>5bn)

....and **moderately** for 47% of midsized plans

and **49%** of small plans

Source: 2016 ILPA Members Survey on Fee & Expense Practices
Drivers of Organizational Interest in Reporting

Source: 2016 ILPA Members Survey on Fee & Expense Practices
Private Equity Fees and Expense Transparency

ILPA Template: Seeking Standardization of GP Fee Disclosures

**Analyzes and Aggregates:**
- LP investment costs
- Economics paid to the management company (including non-arms-length transactions)

**Establishes Standards for Disclosing:**
- Management fees, including itemized offsets
- Fund expenses, itemized
- Carried interest, paid and accrued
- Fees charged to portfolio companies
  - ...on a quarterly basis, to align with LPs’ own fiscal YE and reporting cycles

**Developed in Consultation With:**
- 50+ LP organizations
- 25+ GP organizations
- 10+ trade associations
- 20+ sample templates
Considerations for Implementation

- LP Demand – telegraphing intent, need for additional information, go-forward/new funds
- LPA Negotiation Processes – side letters
- GP modifications – template does not displace Partner’s Capital Account Statement, or supersede the Limited Partnership Agreement
- GP and LP Systems integration – technical debt, legacy system constraints
- Accuracy and verification of provided data
- Other compliance demands on GPs and LPs
A Perspective – Private Equity Fee Transparency From the Role of the Administrator of Asset Owners and Asset Managers

What are the trends, struggles and strategic direction AIS Clients are moving in as the pressure for transparency increases?

**Limited Partners (LP)**
- Increased pressure from constituents, board members, stakeholders and legislative regulators to understand and report on private equity management fee, expenses and incentive compensation/carried interest
- GP Communication and adoption of a single transparency template (ILPA or LP specific) to standardize and streamline the consumption and aggregation of data from many different GPs
- Time consuming review of GP supplied fee transparency templates or reviewing financial statements for non-compliant GPs in order to gather required data
- Need for comprehensive aggregation, analysis and reporting for internal and external use such as Gross and Net IRR, manager level reporting and periodic Limited Partners Agreement (LPA) reviews

**General Partners (GP)**
- Increased pressure from Limited Partners (LP) to provide private equity management fee, expenses and incentive compensation/carried interest data in customized LP templates
- Developing a plan to address various LP requests and requirements and adopting a single scalable means of providing transparency data that may not resolve the needs of all LPs and could impact LP decisions to make future commitments
- LPs view all of their GPs as one in the same and do not always understand the complexities of operating in multiple legal jurisdictions, fund structures and accounting methodologies
- Need for additional resources to not only provide LP required templates and transparency reporting but also to have a strong understanding of the data provided for the inevitable additional inquiries and questions that come with the availability of more data

AIS’ role in assisting TRS of Texas with an effective means to capture, report and analyze the true costs of investing in Private Equity

**TRS of Texas**
- For the past 5 years, AIS has provided TRS with private equity and real assets management fee reporting on a quarterly basis to assist with CAFR reporting
- In October 2016, TRS Staff requested that AIS enhance transparency reporting to track ILPA Fee Transparency Templates (Private Equity) and Enhanced QDIF (Real Assets) and capture management fee, expenses, offsets and incentive compensation/carried interest data in a database to facilitate a more controlled environment, real time online access, analysis, reporting and eFront data feeds
- AIS has committed to providing TRS with enhanced reporting and eFront data feeds by the completion of the Q4 2016 reporting period (March/April 2017) and providing an online solution by the end of 2017
- AIS is expanding usage of 3rd party Optical Character Recognition (OCR) software to efficiently transfer standard template data into enhanced data review technology to ensure the integrity of the data supplied by GPs meets certain conditional expectations and reasonability validations to change TRS staffs current role of tracking down and collating data to focused analysis
• TRS has been a supporter of ILPA since 2002
• TRS has been ILPA board member since 2011
• TRS was a leading LP in development of ILPA Principles in 2009 which has been endorsed by over 300 GPs and LPs

TRS/ILPA Fee Reporting Template Timeline:

2015
• ILPA Engages TRS GPs to Collaborate on Development of Fee Template
• TRS actively involved with ILPA Committee

2016
• ILPA releases Fee/Expense Template; TRS publicly endorses
• TRS requests its GP begin utilizing the template as part of quarterly reporting

2017
• TRS current compliance rate for active funds is 32%
• TRS expects 80%+ of GPs to provide ILPA template for active funds by June 2017
• TRS develops new analytics to compare fee/expense loads as part of due diligence
Speakers Bios
Jennifer Choi, Managing Director, Industry Affairs, Institutional Limited Partners Association (ILPA)

As Managing Director of Industry Affairs for the Institutional Limited Partners Association (ILPA), Jennifer Choi directs the association’s engagement with external industry stakeholders to inform and enhance ILPA’s education, research, membership and advocacy platforms. Ms. Choi also leads the implementation of ILPA’s responses to emerging issues impacting the asset class, including efforts to establish and promote industry best practices.

Prior to joining the ILPA, Ms. Choi served as Vice President of Industry and External Affairs for the Emerging Markets Private Equity Association (EMPEA), where she led the association’s member and industry engagement activities, including efforts to encourage policy frameworks that support the growth of the asset class. As EMPEA’s Research Director, she built the industry’s first global database of private equity activity in the emerging markets. Previously, Ms. Choi was a consultant with Boston-based Stax Inc., leading due diligence engagements and providing advisory services for the U.S. private equity and venture capital industry. Jennifer’s other consulting experience includes organizational development and strategy consulting for clients in the healthcare, financial services and pharmaceutical sectors.

Jennifer holds a Masters in Law and Diplomacy from the Fletcher School at Tufts University and a B.A. summa cum laude in Economics and Political Science from Augustana College.
Lorelei Graye, founder, Leodoran Financial

Lorelei Graye is founder of Leodoran Financial, the plan sponsor consultant for SS&C Conifer Financial Services, and subject matter expert in the private market reporting trends, including investment cost reporting, for institutional investors as well as key issues surrounding public pension policy. Formerly, a reporting officer for the South Carolina Retirement System Investment Commission (RSIC), Lorelei spearheaded the development and implementation of their annual fee collection, validation, and reporting process which was featured in the April 2015 CEM Benchmarking study, “The Time Has Come for Standardized Total Cost Disclosure for Private Equity” [1].

Over the past two years as an industry advocate and strong proponent for standardization, Ms. Graye has travelled extensively to promote best practices with audiences of institutional investor staff, their trustees, and local policymakers. Presentations and media coverage have included the WSJ, FundFire, Governing, Pensions & Investments, The Hedge Fund Law Report, Staying Ahead of the Curve - Cammack Retirement, NCTR, ILPA, APPFA, IMDDA, and the Lowell Milken Institute at UCLA School of Law.

Lorelei holds dual business administration degrees: a bachelor of science majoring in finance and a bachelor of arts with a major in accounting summa cum laude.


[2] [www.ILPA.org](http://www.ILPA.org)
Suresh Krishnamurthy, Senior Managing Director of Global Services, State Street

Suresh Krishnamurthy is a Senior Managing Director within Global Services for State Street Corporation. He has over 22 years of product and technology experience in the Financial Services arena across various investment products.

Suresh currently leads our PE/RE IT and Strategy efforts from a business unit perspective with particular focus on advancing product strategy across our LP and GP businesses and driving adoption of future state IT models with our most strategic customers.

Prior to his current role, Suresh managed State Street’s Private Equity Administration for Private Equity/Real Estate Fund of Funds and Limited Partner Services globally as COO.

Previously, Suresh managed Global IT development for Performance Measurement/ Attribution Solutions, data-warehousing and Information delivery in support of the Performance/Analytics group and the Investment Operations Outsourcing businesses.

Prior to joining State Street as part of the acquisition of the investment services business at Deutsche Bank, Suresh headed Technology and Product Management for the Securities Lending and Short Term Investments business at Deustche Bank.

Suresh holds an M.BA. with Distinction from the Leonard N. Stern School of Business at New York University and a B.S. in Electrical Engineering from the University of California at Los Angeles.
Michael Miaskiewicz, Assistant Vice President, State Street

Mike joined State Street in 2007 and is currently responsible for managing a team in the Limited Partner Services group of AIS, providing investment performance and exposure analysis for the alternative investment portfolios of several of State Street’s large institutional clients. In addition to his oversight responsibilities, Mike also provides support to client services and assists senior management with strategic initiatives. Prior to his current role, Mike was a Portfolio Accountant in Institutional Investor Services division until he joined the Private Edge group in 2008 and then the AIS LP Services Team (formerly Private Edge) in 2013. Mike received his Master in Business Administration from Suffolk University and his B.A. from Boston University.
Paul Yett, Managing Director, Hamilton Lane

Paul is a Managing Director at Hamilton Lane, based in the firm’s San Francisco office, where he is involved in both the firm’s investment activities and client relationships. Paul began his career with Hamilton Lane in 1998 in the Due Diligence Department, where he managed the firm’s global venture capital practice and real estate. Paul is an Investment Committee member and manages a number of the firm’s client relationships.

Prior to joining Hamilton Lane, Paul spent four years with Stone Pine Asset Management, LLC, a Denver-based private equity firm, where he was part of a team that managed a direct private equity mezzanine fund under the parent company, FCM Fiduciary Capital Management Company. Paul began his career in Denver as a Lease Accountant with Bramalea U.S. Properties where he covered several of the firm’s U.S. commercial retail properties. Paul received a B.S. in Finance from San Diego State University.

Paul currently serves on the governing board of the Robert Toigo Foundation.
Proxy Voting

What is a Proxy?

- Owning stock in a company gives an investor the right to vote on important matters concerning corporate policies and governance.
- Prior to an annual meeting, companies send their shareowners a proxy statement and a proxy card or ballot.
- Shareowners can vote in person, or remotely, by signing the proxy card and returning it by mail or electronically, via third-party to the agent that is legally authorized to solicit votes.
- Teacher Retirement System of Texas votes by proxy, using ISS as its proxy voting agent.

Why is Proxy Voting important?

- Protection of public fund assets
- Unlocking shareholder value
- Fiduciary obligations
- Broad market diversification
A Comprehensive Proxy Research Solution

Comply with Regulatory Requirements & Best Practices

EXPERTISE

› 30+ years of market leadership and experience
› Team of 375+ research & data professionals, including 225+ research analysts, located in twelve countries
› Specialists in compensation, M&A, ESG and industry-specific issues
› In-depth US and global proxy voting guidelines, updated annually, address over 500 distinct governance issues

QUALITY

› Thorough internal review, ongoing audits and specialized focus on complex matters
› Secondary review of all research reports published.
› Continuous product innovation to enhance research content and timeliness
› Annual SSAE16 Certification

COVERAGE

› Comprehensive global coverage of all of your common equity holdings
› 39,000+ meetings and 330,000+ agenda items covered each year across 115+ markets
› Over 6,300 unique issuers voted for Texas TRS in 2016

ENGAGEMENT

› Fact-checking and company dialogue, before research is published
› Robust process, with draft reports to largest companies in major markets

Procurement Centers (Rockville, Norman, Manila & Brussels)
ISS Global Voting Principles

Accountability, Stewardship, Independence, Transparency

The principles guide ISS’ work to assist institutional investors in meeting their fiduciary requirements with respect to voting, by promoting long-term shareholder value creation and risk mitigation at their portfolio firms through support of responsible global corporate governance practices.

- **Accountability**
  - Company boards should be accountable to shareholders, the owners of the companies
  - Directors should respond to investor input provided through votes and other shareholder communications

- **Stewardship**
  - A company’s governance, social, and environmental practices should meet or exceed the standards of its market regulations and general practices, and take into account relevant factors that may impact significantly the company’s long-term value creating.
  - Issuers and investors should recognize constructive engagement as both a right and a responsibility.

- **Independence**
  - Company boards should be sufficiently independent, so as to effectively supervise management’s performance and remuneration, for the benefit of all shareholders

- **Transparency**
  - Companies should provide sufficient and timely information that enables shareholders to understand key issues, make informed decisions, and effectively engage with companies.
Rigorous & Inclusive Policy Guideline Formulation Process

- A transparent and inclusive approach that includes ongoing market feedback, surveys, roundtables and an open industry comment period.
- Market specific policies for the US, Canada, UK/Ireland, EMEA markets, Latin America/Brazil, Australia, Japan, Pan-Asia

- **Annual Policy Survey** brings in perspectives from institutional investors, corporate issuers and governance experts across the globe, allowing all market constituents to actively participate in ISS’ policy development process.
- **Extensive In-person Discussion Forums** and roundtables augment the policy process.
- **Balanced Viewpoints** through guidelines that strike the right balance between shareholder interests and economic practicality.
- **Engagement with Issuers** on behalf of shareholders ensures a full understanding of the facts and enriches our analysis.
ISS Global Research Team

Instituting Research Standards & Ensuring Objectivity

ISS’ voting recommendations are based on established governance policies that combine internal expertise with input from the broader governance community.

ISS has implemented quality controls across the firm’s business units to ensure high levels of accuracy, quality and timeliness. These systems and controls include:

- Comprehensive information procurement processes for gathering issuer-published information and meeting documentation;
- Verification that data used is consistent with relevant issuer-published information, or other publicly available sources;
- Preparation of research reports and vote recommendations by appropriately trained analysts;
- Review of all research reports and vote recommendations by second analyst with relevant expertise;
- Providing certain issuers (for example, U.S. companies in the S&P 500 index) with the opportunity to review a draft proxy analysis to further confirm factual accuracy, where timing and other circumstances permit; and
- Implementation of an equity plan data verification interface to enable relevant issuers to verify underlying equity plan information used by ISS in its research and vote recommendations on such plans

Example analysis attached: The Dow Chemical Company
ISS Partners with Teacher Retirement System of Texas to Fulfill Fiduciary Duties

**The Voting Process, The Texas Way**

- **TRS Board**
  - Board reviews and adopts Proxy Policy
  - Board approves Proxy Services provider
  - Board reviews annual guideline updates
  - CIO appoints TRS Proxy Committee

- **TRS Proxy Committee**
  - Establishes process, timing and reporting for proxy activity based on Board approved policy
  - Reviews ISS Proxy Voting Guidelines (US and international annually)
  - Meets quarterly or as needed to discuss voting results and any exceptions
  - Reports Proxy Exceptions to the Board
  - Communicates as needed with the Executive director, CIO, and Policy Committee Chair

- **ISS**
  - Provides governance research, proxy voting execution and reconciliation, technology platform, and comprehensive reporting
  - Seamless integration with State Street
  - Generates annual guideline updates

- **State Street**
  - Provides holdings to ISS as of record date
  - Maintains country-specific Powers of Attorney

- **Investment Operations**
  - Coordinates proxy voting activity among Proxy Committee, ISS and State Street
  - Generates and maintains proxy summary reporting and exceptions
ISS’ Proxy Voting Services

Continuous quality control measures provide for a reliable and accurate system to carry out your fiduciary duties.
TRSI: ISS | Institutional Shareholder Services Inc.

2016 TRS of Texas Proxy Season in Review

Meeting the Demands of a Complex Voting Environment

TRSI of Texas’ diversified portfolio requires expertise in best practices across various markets

- **Meetings Voted by Market, U.S. vs. Non-U.S.**
  - 26% USA
  - 74% Non-US

- A total of 6,300+ unique issuers were voted
- 1,996 meetings for U.S. issuers were voted
- 5,692 meetings for non-U.S. issuers were voted
- Voted over 11,959,318,000 shares in 2016

**Management/Shareholder Proposal Ratio**

- Management - 97.1%
- Shareholder - 2.9%

**Company** | **Market Cap** | **TRS Holdings** | **% Held (TRS)**
--- | --- | --- | ---
The Dow Chemical Company | 68.7B | 112.0M | 0.16%
Oracle Corporation | 165.08 | 170.2M | 0.10%
Ford Motor Company | 49.68 | 47.2M | 0.10%
Bank of America Corporation | 238.48 | 219.2M | 0.09%
Pfizer Inc. | 190.68 | 160.9M | 0.08%
AT&T Inc. | 253.28 | 212.0M | 0.08%
Apple Inc. | 678.38 | 519.5M | 0.08%
Cisco Systems, Inc. | 155.58 | 117.0M | 0.08%
Microsoft Corporation | 508.58 | 372.0M | 0.07%
General Electric Company | 265.58 | 122.2M | 0.05%

**Management Proposals by Topic**

- Directors Related - 53%
- Routine/Business - 26%
- Non-Salary Comp. - 8%
- Capitalization - 8%
- Mergers/Antitrust/Anti-Bondholder - 5%

**Shareholder Proposals by Topic**

- Directors Related - 59%
- Other - 11%
- Corp. Governance - 9%
- Routine/Business - 9%
- Miscellaneous - 12%
Looking Ahead

Key Topics for 2017 Proxy Season

- Continuing Surge on Proxy Access
  - More line item veto proposals expected in wake of SEC advice

- Focus on Board Composition
  - Surge of activism/engagement expected on diversity and tenure

- Hedge Funds Remain Active, But Most Fights Settled in 2016
  - Energy concerns and financials may top target lists
THANK YOU

Fassil Michael  
Executive Director, Head of Custom Research  
fassil.michael@issgovernance.com

Meghan Orifici  
Executive Director, Regional Director, Client Service & Consultants  
meghan.orifici@issgovernance.com
The Dow Chemical Company
Annual Meeting
5.12.2016
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The Dow Chemical Company

Key Takeaways
Shareholders would benefit from a meaningful, well-crafted proxy access right. The precatory shareholder proposal would enhance shareholders' rights while providing necessary safeguards to the nomination process.

While support is warranted for all director nominees, shareholders may wish to consider the special incentive arrangements in place for the two candidates designated by Third Point LLC.

Agenda & Recommendations

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<tr>
<th>Item</th>
<th>Code</th>
<th>Proposal</th>
<th>Board Rec.</th>
<th>ISS Rec.</th>
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<tr>
<td>1a</td>
<td>M0201</td>
<td>Elect Director Ajay Banga</td>
<td>FOR</td>
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</tr>
<tr>
<td>1b</td>
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<td>1c</td>
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<tr>
<td>1d</td>
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<td>1m</td>
<td>M0201</td>
<td>Elect Director Ruth G. Shaw</td>
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<td>2</td>
<td>M0101</td>
<td>Ratify Deloitte &amp; Touche LLP as Auditors</td>
<td>FOR</td>
<td>FOR</td>
</tr>
<tr>
<td>3</td>
<td>M0550</td>
<td>Advisory Vote to Ratify Named Executive Officers' Compensation</td>
<td>FOR</td>
<td>FOR</td>
</tr>
</tbody>
</table>

SHAREHOLDER PROPOSALS

| 4    | S0221 | Proxy Access                                | AGAINST    | FOR      |

Shading indicates that ISS recommendation differs from Board recommendation.

Items deserving attention due to contentious issues or controversy.

Report Contents

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<tr>
<td>Governance QuickScore</td>
<td>9</td>
<td></td>
</tr>
</tbody>
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ISS-Company Dialogue

<table>
<thead>
<tr>
<th>Dates</th>
<th>Topic(s)</th>
<th>Initiated By</th>
<th>Notes</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov 30 2015</td>
<td>Board – Composition/Independence, Company Performance, Compensation - MSOP</td>
<td>Issuer</td>
<td>The company discussed its recent performance, as well as executive compensation and the addition of new directors to the board.</td>
<td>Explanation of Company Practice/ Rationale</td>
</tr>
<tr>
<td>April 16 2016</td>
<td>Draft Review</td>
<td>ISS</td>
<td>The company was given the opportunity to review a draft of this analysis for fact-checking purposes.</td>
<td></td>
</tr>
</tbody>
</table>

Note: ISS engages in ongoing dialogue with issuers in order to ask for additional information or clarification, but not to engage on behalf of its clients. Any draft review which may occur as part of this process is done for purposes of data verification only. All ISS recommendations are based solely upon publicly disclosed information.

Material Company Updates

<table>
<thead>
<tr>
<th>Item</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merger</td>
<td>On Dec. 11, 2015, the company entered into an agreement with E. I. du Pont de Nemours and Co. to effect an all-stock merger of equals. That merger is expected to close in the second half of 2016. Following the merger, the companies intend to separate the combined company’s agriculture, specialty products and material sciences businesses into three independent companies.</td>
</tr>
<tr>
<td>Management Updates</td>
<td>CFO Howard I. Ungerleider was appointed to the additional post of vice chairman on Oct. 22, 2015. James R. Fitterling was appointed vice chairman and COO on Oct. 22, 2015, and president on Feb. 2, 2016. Andrew N. Liveris, who served as president until Fitterling’s appointment to that post, remains chairman and CEO, but the company has announced that Liveris will transition out of the company on the earlier of June 30, 2017 or the material completion of the anticipated separations following closing of the Dow/DuPont merger transaction.</td>
</tr>
</tbody>
</table>
Financial Highlights

Company Description: The Dow Chemical Company manufactures and supplies products that are used primarily as raw materials in the manufacture of customer products and services worldwide.

STOCK PRICE PERFORMANCE

![Graph showing stock price performance from Jan-11 to Jan-16 for The Dow Chemical Company, MSCI ACWI: Chemicals, and S&P 500]

FINANCIAL & OPERATIONAL PERFORMANCE

<table>
<thead>
<tr>
<th>Historical Performance (FY ending)</th>
<th>Compared to Peers (Compustat FY*) – 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings</td>
<td></td>
</tr>
<tr>
<td>Revenue (M)</td>
<td>59,985</td>
</tr>
<tr>
<td>Net Income (M)</td>
<td>2,742</td>
</tr>
<tr>
<td>EBITDA (M)</td>
<td>6,925</td>
</tr>
<tr>
<td>EPS (USD)</td>
<td>2.06</td>
</tr>
<tr>
<td>EPS Y/Y Growth (%)</td>
<td>18</td>
</tr>
<tr>
<td>Profitability</td>
<td></td>
</tr>
<tr>
<td>Pretax Net Margin (%)</td>
<td>6</td>
</tr>
<tr>
<td>EBITDA Margin (%)</td>
<td>12</td>
</tr>
<tr>
<td>Return on Equity (%)</td>
<td>13</td>
</tr>
<tr>
<td>Return on Assets (%)</td>
<td>4</td>
</tr>
<tr>
<td>ROIC (%)</td>
<td>6</td>
</tr>
<tr>
<td>Leverage</td>
<td></td>
</tr>
<tr>
<td>Debt/Assets</td>
<td>31</td>
</tr>
<tr>
<td>Debt/Equity</td>
<td>97</td>
</tr>
<tr>
<td>Cash Flows</td>
<td></td>
</tr>
<tr>
<td>Operating (M)</td>
<td>3,879</td>
</tr>
<tr>
<td>Investing (M)</td>
<td>-1,991</td>
</tr>
<tr>
<td>Financing (M)</td>
<td>-3,362</td>
</tr>
<tr>
<td>Net Change (M)</td>
<td>-1,595</td>
</tr>
<tr>
<td>Valuation &amp; Performance</td>
<td></td>
</tr>
<tr>
<td>Price/Earnings</td>
<td>14.00</td>
</tr>
<tr>
<td>Annual TSR (%)</td>
<td>-13.14</td>
</tr>
</tbody>
</table>

Source: Compustat. *Note: Compustat standardizes financial data and fiscal year designations to allow for meaningful comparison across companies. Compustat data may differ from companies’ disclosed financials and does not incorporate non-trading equity units. Peers shown here represent closest Industry peers drawn from those peers used in ISS’ pay-for-performance analysis. See www.issgovernance.com/policy-gateway/company-financials-faq for more information.

TOTAL SHAREHOLDER RETURNS

<table>
<thead>
<tr>
<th>1 Yr</th>
<th>3 Yr</th>
<th>5 Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company TSR (%)</td>
<td>16.97</td>
<td>20.81</td>
</tr>
<tr>
<td>GICS 1510 TSR (%)</td>
<td>-14.80</td>
<td>4.15</td>
</tr>
<tr>
<td>S&amp;P500 TSR (%)</td>
<td>1.38</td>
<td>15.13</td>
</tr>
</tbody>
</table>

Source: Compustat. As of last day of company FY end month: 12/31/2015

COMPANY SNAPSHOT

Market Cap (M) | 56,168.4 |
Closing Price | 50.28 |
Annual Dividend | 1.72 |
52-Week High | 57.10 |
52-Week Low | 35.11 |
Shares Outstanding (M) | 1117.11 |
Average daily trading volume (prior mo)* | 6,733.19 |

As of March 14, 2016 (All currency in USD) * Trading Volume in thousands of shares

Publication Date: 19 April 2016
Corporate Governance Profile

BOARD & COMMITTEE SUMMARY

<table>
<thead>
<tr>
<th></th>
<th>Independence</th>
<th>Members</th>
<th>Meetings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Board</td>
<td>92%</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Audit</td>
<td>100%</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Compensation</td>
<td>100%</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Nominating</td>
<td>100%</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Chairman classification | Insider
- Separate chair/CEO | No
- Independent lead director | Yes
- Voting standard | Majority
- Plurality carveout for contested elections | Yes
- Resignation policy | Yes
- Total director ownership (000 shares) | 5,711
- Total director ownership (%) | N/A
- Percentage of directors owning stock | 100%
- Number of directors attending < 75% of meetings | 0
- Number of directors on excessive number of outside boards | 0
- Average director age | 63 years
- Average director tenure | 8 years
- Percentage of women on board | 15%

SHAREHOLDER RIGHTS SUMMARY

- Controlled company | No
- Classified board | No
- Dual-class stock | No
- Vote standard for mergers/acquisitions | Majority
- Vote standard for charter/bylaw amendment | Majority
- Shareholder right to call special meetings | Yes, 25%
- Material restrictions on right to call special meetings | No
- Shareholder right to act by written consent | No
- Cumulative voting | No
- Board authorized to issue blank-check preferred stock | Yes
- Poison pill | No
- Proxy Access | No
# Board Profile (after upcoming meeting)

## Director Independence & Affiliations

### EXECUTIVE DIRECTORS

<table>
<thead>
<tr>
<th>On Ballot</th>
<th>Name</th>
<th>Affiliation</th>
<th>Independence Classification</th>
<th>Attend &lt;75%</th>
<th>Gender</th>
<th>Age</th>
<th>Tenure</th>
<th>Term Ends</th>
<th>Outside Key Committees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Andrew Liveris</td>
<td>CEO/Chair</td>
<td>Non-Independent Insider</td>
<td>M</td>
<td>61</td>
<td>12</td>
<td>2017</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### NON-EXECUTIVE DIRECTORS

<table>
<thead>
<tr>
<th>On Ballot</th>
<th>Name</th>
<th>Affiliation</th>
<th>Independence Classification</th>
<th>Attend &lt;75%</th>
<th>Gender</th>
<th>Age</th>
<th>Tenure</th>
<th>Term Ends</th>
<th>Outside Key Committees</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>Jeff Fettig</td>
<td>Lead Director</td>
<td>Independent Outsider</td>
<td>M</td>
<td>58</td>
<td>13</td>
<td>2017</td>
<td>1</td>
<td>✓ M C C</td>
</tr>
<tr>
<td>✓</td>
<td>Ajay Banga</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>56</td>
<td>3</td>
<td>2017</td>
<td>1</td>
<td>✓ M</td>
</tr>
<tr>
<td>✓</td>
<td>Jacqueline Barton</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>F</td>
<td>63</td>
<td>23</td>
<td>2017</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>✓</td>
<td>James Bell</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>67</td>
<td>11</td>
<td>2017</td>
<td>3</td>
<td>C F M M</td>
</tr>
<tr>
<td>✓</td>
<td>Richard Davis</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>58</td>
<td>1</td>
<td>2017</td>
<td>2</td>
<td>✓ F</td>
</tr>
<tr>
<td>✓</td>
<td>Mark Loughridge</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>62</td>
<td>1</td>
<td>2017</td>
<td>0</td>
<td>F</td>
</tr>
<tr>
<td>✓</td>
<td>Raymond Milchovich</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>66</td>
<td>1</td>
<td>2017</td>
<td>1</td>
<td>M</td>
</tr>
<tr>
<td>✓</td>
<td>Robert Miller</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>74</td>
<td>1</td>
<td>2017</td>
<td>2</td>
<td>M M</td>
</tr>
<tr>
<td>✓</td>
<td>Paulus Polman</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>59</td>
<td>6</td>
<td>2017</td>
<td>1</td>
<td>✓</td>
</tr>
<tr>
<td>✓</td>
<td>Dennis Reilley</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>62</td>
<td>9</td>
<td>2017</td>
<td>1</td>
<td>C M M</td>
</tr>
<tr>
<td>✓</td>
<td>James Ringler</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>M</td>
<td>70</td>
<td>15</td>
<td>2017</td>
<td>4</td>
<td>F</td>
</tr>
<tr>
<td>✓</td>
<td>Ruth Shaw</td>
<td>Independent</td>
<td>Independent Outsider</td>
<td>F</td>
<td>67</td>
<td>11</td>
<td>2017</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

*M = Member | C = Chair | F = Financial Expert

*Indicates director not previously submitted to shareholders for election.

### Director Notes

**Jeff Fettig**

The company had sales to or purchases from Whirlpool Corporation which amounted to less than 0.45 percent of the recipient's revenues during 2015. Jeff M. Fettig serves as CEO of that firm. (Source: DEF14A, 4/1/16, pp. 5, 10.)

**Richard Davis**

1) On Nov. 20, 2014, the company entered into a support agreement with Third Point LLC, pursuant to which Third Point will vote in favor of the company's nominees at the 2015 annual meeting and has agreed to a one year standstill and voting agreement. Richard K. Davis was nominated to the board in connection with the agreement.

2) During 2015, there were no sales to or purchases from U.S. Bancorp. Davis serves as CEO of that firm. (Source: DEF14A, 4/1/16, pp. 5, 10, 50; 8-K, 11/21/14, under "Item 1.01 and 5.02" and "EXHIBIT C" sections.)

**Mark Loughridge**

1) On Nov. 20, 2014, the company entered into a support agreement with Third Point LLC, pursuant to which Third Point will vote in favor of the company's nominees at this year's annual meeting and has agreed to a one year standstill and voting agreement. Mark Loughridge was appointed to the board in connection with the agreement.

2) The company had sales to or purchases from International Business Machines Corporation which amounted to less than 0.45 percent of the recipient's revenues during 2015. Loughridge served as an executive officer of that firm until December 2013. (Source: DEF14A, 4/1/16, pp. 6, 10, 8-K, 11/21/14, under "Item 1.01 and 5.02" and "EXHIBIT C" sections.)
Raymond Milchovich  On Nov. 20, 2014, the company entered into a support agreement with Third Point LLC, pursuant to which Third Point will vote in favor of the company’s nominees at the 2015 annual meeting and has agreed to a one year standstill and voting agreement. Raymond J. Milchovich was appointed to the board in connection with the agreement. (Source: DEF14A, 4/1/16, p. 50; 8-K, 11/21/14, under "Item 1.01 and 5.02" and "EXHIBIT C" sections.)

Robert Miller  On Nov. 20, 2014, the company entered into a support agreement with Third Point LLC, pursuant to which Third Point will vote in favor of the company’s nominees at this year’s annual meeting and has agreed to a one year standstill and voting agreement. Robert S. Miller was appointed to the board in connection with the agreement. 2) The company had purchases to International Automotive Components Group which amounted to less than 0.45 percent of the recipient’s revenues during 2015. Miller serves as an executive officer of that firm. (Source: DEF14A, 4/1/16, pp. 7, 10, 13, 14; 8-K, 11/21/14, under "Item 1.01 and 5.02" and "EXHIBIT C" sections.)

Paulus Polman  The company had sales to or purchases from Unilever plc/NV which amounted to less than 0.45 percent of the recipient’s revenues during 2014. Paul Polman serves as CEO of that firm. (Source: DEF14A, 4/1/16, pp. 8, 10.)

### Director Employment, Compensation & Ownership

<table>
<thead>
<tr>
<th>Name</th>
<th>Primary Employment</th>
<th>Outside Boards</th>
<th>Total Compensation*</th>
<th>Shares Held</th>
<th>60-day Options</th>
<th>Total Voting Power (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Liveris</td>
<td>CEO, Chairman - The Dow Chemical Co.</td>
<td>International Business Machines Corp.</td>
<td>**</td>
<td>815,860</td>
<td>4,545,151</td>
<td>5,361,011</td>
</tr>
<tr>
<td>Jeff Fettig</td>
<td>CEO, Chairman - WHIRLPOOL CORP.</td>
<td>WHIRLPOOL CORP.</td>
<td>295,471</td>
<td>36,240</td>
<td>10,950</td>
<td>47,190</td>
</tr>
<tr>
<td>Ajay Banga</td>
<td>CEO, President - MasterCard Inc.</td>
<td>MasterCard Inc.</td>
<td>250,471</td>
<td>9,386</td>
<td>0</td>
<td>9,386</td>
</tr>
<tr>
<td>Jacqueline Barton</td>
<td>Academic</td>
<td></td>
<td>265,471</td>
<td>40,936</td>
<td>10,950</td>
<td>51,886</td>
</tr>
<tr>
<td>James Bell</td>
<td>Prof Director</td>
<td>JPMorgan Chase &amp; Co., CDW Corp., Apple Inc.</td>
<td>286,033</td>
<td>29,780</td>
<td>10,950</td>
<td>40,730</td>
</tr>
<tr>
<td>Richard Davis</td>
<td>CEO, Chairman - U.S. Bancorp</td>
<td>Xcel Energy Inc., U.S. Bancorp</td>
<td>232,971</td>
<td>2,704</td>
<td>0</td>
<td>2,704</td>
</tr>
<tr>
<td>Mark Loughridge</td>
<td>Retired</td>
<td></td>
<td>265,471</td>
<td>4,778</td>
<td>0</td>
<td>4,778</td>
</tr>
<tr>
<td>Raymond Milchovich</td>
<td>Prof Director</td>
<td>Nucor Corp.</td>
<td>250,471</td>
<td>8,104</td>
<td>0</td>
<td>8,104</td>
</tr>
<tr>
<td>Robert Miller</td>
<td>Other</td>
<td>Symantec Corp., AMERICAN INTERNATIONAL GROUP, INC.</td>
<td>250,471</td>
<td>7,630</td>
<td>0</td>
<td>7,630</td>
</tr>
<tr>
<td>Paulus Polman</td>
<td>CEO - Unilever plc</td>
<td>Unilever plc, Unilever NV</td>
<td>250,471</td>
<td>43,350</td>
<td>0</td>
<td>43,350</td>
</tr>
<tr>
<td>Dennis Reilley</td>
<td>Consultant</td>
<td>Marathon Oil Corp.</td>
<td>270,471</td>
<td>32,630</td>
<td>0</td>
<td>32,630</td>
</tr>
<tr>
<td>James Ringler</td>
<td>Prof Director</td>
<td>Autoliv, Inc., FMC Technologies, Inc., Teradata Corp., John Bean Technologies Corp.</td>
<td>265,471</td>
<td>44,639</td>
<td>10,950</td>
<td>55,589</td>
</tr>
<tr>
<td>Ruth Shaw</td>
<td>Prof Director</td>
<td>DTE Energy Co., SPX Corp.</td>
<td>258,210</td>
<td>35,054</td>
<td>10,950</td>
<td>46,004</td>
</tr>
</tbody>
</table>

*Local market currency  
**For executive director data, please refer to Executive Pay Overview.

### Additional Notes

Directors Milchovich and Miller received compensation from shareholder Third Point LLC, who originally nominated them to the board. For further details, see the director election analysis below.
## Compensation Profile

### EXECUTIVE PAY OVERVIEW

<table>
<thead>
<tr>
<th>Executive</th>
<th>Title</th>
<th>Base Salary</th>
<th>Change in Pension, Deferred Comp, All Other Comp</th>
<th>Bonus &amp; Non-equity Incentives</th>
<th>Restricted Stock</th>
<th>Option Grant</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Liveris</td>
<td>CEO &amp; Chairman</td>
<td>1,931</td>
<td>1,348</td>
<td>5,712</td>
<td>8,471</td>
<td>3,092</td>
<td>20,554</td>
</tr>
<tr>
<td>H. Ungerleider</td>
<td>Vice Chairman &amp; Chief Financial Officer</td>
<td>1,001</td>
<td>587</td>
<td>2,165</td>
<td>2,590</td>
<td>946</td>
<td>7,289</td>
</tr>
<tr>
<td>J. Fitterling</td>
<td>Vice Chairman &amp; Chief Operating Officer</td>
<td>1,001</td>
<td>578</td>
<td>2,165</td>
<td>2,590</td>
<td>946</td>
<td>7,280</td>
</tr>
<tr>
<td>J. Harlan</td>
<td>Vice Chairman &amp; Chief Commercial Officer</td>
<td>1,001</td>
<td>235</td>
<td>1,968</td>
<td>2,590</td>
<td>946</td>
<td>6,740</td>
</tr>
<tr>
<td>C. Kalil</td>
<td>General Counsel &amp; Executive Vice President</td>
<td>1,030</td>
<td>486</td>
<td>1,850</td>
<td>2,345</td>
<td>856</td>
<td>6,568</td>
</tr>
</tbody>
</table>

**Median CEO Pay**

| ISS Selected Peer Group | 1,588 | 2,220 | 4,155 | 5,475 | 3,291 | 18,437 |
| Company Defined Peers   | 1,588 | 2,220 | 3,816 | 5,702 | 2,738 | 17,879 |

Source: ISS. Pay in $thousands. Total pay is sum of all reported pay elements, using ISS' Black-Scholes estimate for option grant-date values. Note: Median total pay will not equal sum of pay elements medians. Company Defined Peers are as disclosed. More information on ISS’ peer group methodology at [www.issgovernance.com/policy-gateway/us-compensation-policy-guidance/](http://www.issgovernance.com/policy-gateway/us-compensation-policy-guidance/)
OPTION VALUATION ASSUMPTIONS

<table>
<thead>
<tr>
<th>For CEO’s last FY Grant</th>
<th>Company</th>
<th>ISS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatility (%)*</td>
<td>27.84</td>
<td>25.04</td>
</tr>
<tr>
<td>Dividend Yield (%)*</td>
<td>3.54</td>
<td>3.07</td>
</tr>
<tr>
<td>Term (yrs)*</td>
<td>7.70</td>
<td>10.00</td>
</tr>
<tr>
<td>Risk-free Rate (%)*</td>
<td>1.02</td>
<td>2.02</td>
</tr>
<tr>
<td>Grant date fair value per option*</td>
<td>11.61</td>
<td>9.89</td>
</tr>
<tr>
<td>Grant Date Fair Value ($ in 000)**</td>
<td>3,630</td>
<td>3,092</td>
</tr>
</tbody>
</table>

*Source: Standard & Poor’s Xpressfeed; **Source DEF14A (company value); ISS (ISS value); Difference between ISS and company grant date fair value -14.81%

CEO TALLY SHEET

<table>
<thead>
<tr>
<th>CEO</th>
<th>A. Liveris</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO tenure at FYE:</td>
<td>11.1 years</td>
</tr>
<tr>
<td>Present value of all accumulated pension:</td>
<td>$34,450,363</td>
</tr>
<tr>
<td>Value of CEO stock owned (excluding options):</td>
<td>$41,021,440</td>
</tr>
</tbody>
</table>

Potential Termination Payments

- Involuntary termination without cause: $3,903,849
- Termination after a change in control: $57,392,673

Source: DEF14A

CEO PAY MULTIPLES

<table>
<thead>
<tr>
<th>Compared to</th>
<th>Multiple</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd highest active executive</td>
<td>2.82</td>
</tr>
<tr>
<td>Average active NEO</td>
<td>2.95</td>
</tr>
<tr>
<td>ISS peer median</td>
<td>1.11</td>
</tr>
<tr>
<td>Company peer median</td>
<td>1.15</td>
</tr>
</tbody>
</table>

Source: ISS

3-YEAR GRANTED VS. REALIZABLE CEO PAY

3-year TSR: 20.81%

Source: DEF14A and ISS ($ in thousands)

Granted pay equals the sum of all CEO pay, as disclosed in the proxy statement for the applicable fiscal years, except that equity grant values may be based on ISS' valuation. Realizable pay equals the sum of all cash paid (as disclosed) during the same period, plus the value of all equity grants at the end of the period (based on earned value, if applicable, or re-calculated FV of target level equity awards not yet earned/ vested). For additional information, please visit www.issgovernance.com/policy-gateway/us-compensation-policy-guidance/
## Dilution & Burn Rate

### DILUTION

<table>
<thead>
<tr>
<th></th>
<th>Dilution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Dow Chemical Company</td>
<td>9.96</td>
</tr>
<tr>
<td>Peer group median</td>
<td>6.61</td>
</tr>
<tr>
<td>Peer group weighted average</td>
<td>4.13</td>
</tr>
<tr>
<td>Peer group 75th percentile</td>
<td>11.32</td>
</tr>
</tbody>
</table>

Dilution is the sum of the total amount of shares available for grant and outstanding under options and other equity awards (vested and unvested) expressed as a percentage of total basic common shares outstanding as of the record date. The dilution figure typically excludes employee stock purchase plans (ESPPs) and 401(k) shares. The underlying information for the company is based on the company’s equity compensation table in the most recent proxy statement or 10-K.

### BURN RATE

<table>
<thead>
<tr>
<th></th>
<th>Non-Adjusted (%)</th>
<th>Adjusted (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year</td>
<td>0.55</td>
<td>0.97</td>
</tr>
<tr>
<td>3-year average</td>
<td>0.98</td>
<td>1.47</td>
</tr>
</tbody>
</table>

Burn rate equals the number of shares granted in each fiscal year, including stock options, restricted stock (units), actual performance shares delivered under the long-term incentive plan or earned deferred shares, to employees and directors divided by weighted average common shares outstanding. The adjusted burn rate places a premium on grants of full-value awards using a multiplier based on the company’s annual volatility.

### ISS Governance QuickScore

A decile score of 1 indicates lower governance risk, while a 10 indicates higher governance risk.

Scores indicate decile rank relative to index or region.

#### ISS Governance QuickScore Pillars

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board Structure</td>
<td>4</td>
</tr>
<tr>
<td>Shareholder Rights</td>
<td>3</td>
</tr>
<tr>
<td>Compensation</td>
<td>6</td>
</tr>
<tr>
<td>Audit &amp; Risk Oversight</td>
<td>1</td>
</tr>
</tbody>
</table>

ISS Governance QuickScore is derived from publicly disclosed data on a company’s governance practices. Scores indicate decile rank among relative index or region. Scores are calculated at each pillar by summing the factor scores in that pillar. Not all factors and not all subcategories have equal weight. For more information on ISS Governance QuickScore, visit www.issgovernance.com/QuickScore. For questions, please contact: Quickscore@issgovernance.com.
## Vote Results

### ANNUAL MEETING 14 MAY 2015

<table>
<thead>
<tr>
<th>Proposal</th>
<th>Board Rec</th>
<th>ISS Rec</th>
<th>Disclosed Result</th>
<th>Support Including Abstains (%)[^1]</th>
<th>Support Excluding Abstains (%)[^2]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a Elect Director Ajay Banga</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>97.9</td>
<td>98.5</td>
</tr>
<tr>
<td>1b Elect Director Jacqueline K. Barton</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>98.0</td>
<td>98.5</td>
</tr>
<tr>
<td>1c Elect Director James A. Bell</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>96.6</td>
<td>97.2</td>
</tr>
<tr>
<td>1d Elect Director Richard K. Davis</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>96.1</td>
<td>96.7</td>
</tr>
<tr>
<td>1e Elect Director Jeff M. Fettig</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>95.8</td>
<td>96.3</td>
</tr>
<tr>
<td>1f Elect Director Andrew N. Liveris</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>93.5</td>
<td>94.3</td>
</tr>
<tr>
<td>1g Elect Director Mark Loughridge</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>97.4</td>
<td>98.0</td>
</tr>
<tr>
<td>1h Elect Director Raymond J. Milchovich</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>96.8</td>
<td>97.4</td>
</tr>
<tr>
<td>1i Elect Director Robert S. Miller</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>95.4</td>
<td>96.1</td>
</tr>
<tr>
<td>1j Elect Director Paul Polman</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>97.3</td>
<td>97.9</td>
</tr>
<tr>
<td>1k Elect Director Dennis H. Reilley</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>96.8</td>
<td>97.4</td>
</tr>
<tr>
<td>1l Elect Director James M. Ringler</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>89.6</td>
<td>90.1</td>
</tr>
<tr>
<td>1m Elect Director Ruth G. Shaw</td>
<td>For</td>
<td>For</td>
<td>Majority</td>
<td>97.5</td>
<td>98.1</td>
</tr>
<tr>
<td>2 Ratify Deloitte &amp; Touche LLP as Auditors</td>
<td>For</td>
<td>For</td>
<td>Pass</td>
<td>98.2</td>
<td>98.6</td>
</tr>
<tr>
<td>3 Advisory Vote to Ratify Named Executive Officers' Compensation</td>
<td>For</td>
<td>For</td>
<td>Pass</td>
<td>87.2</td>
<td>88.3</td>
</tr>
<tr>
<td>4 Pro-rata Vesting of Equity Awards</td>
<td>Against</td>
<td>For</td>
<td>Withdrawn</td>
<td>Not Available</td>
<td>N/A</td>
</tr>
</tbody>
</table>

[^1]: Support Including Abstains is defined as %FOR/(For + Against + Abstain), as expressed as a percentage.

[^2]: Support Excluding Abstains is defined as %FOR/(For + Against), as expressed as a percentage, provided if different from For + Against + Abstain.
Meeting Agenda & Proposals

Items 1a-1m. Elect Directors

**FOR**

**VOTE RECOMMENDATION**

A vote FOR the director nominees is warranted, with caution in the case of nominees Raymond J. Milchovich and Robert S. Miller, who are parties to special compensation arrangements with Third Point LLC that some shareholders may view as potentially compromising their ability to provide effective oversight of management.

**BACKGROUND INFORMATION**

- Policies: Board Accountability | Board Responsiveness | Director Competence | Director Independence | Election of Directors | ISS Categorization of Directors | Vote No campaigns

**Vote Requirement:** The company has adopted a majority vote standard (of shares cast) for the election of directors with a plurality carve-out for contested elections, and has a director resignation policy in its governance guidelines.

**Discussion**

Please see the Board Profile section above for more information on director nominees.

**COMPENSATION OF THIRD POINT DIRECTORS**

Directors Raymond J. Milchovich and Robert S. Miller were appointed to the board on Jan. 1, 2015 as designees of Third Point LLC, which currently owns 2.26 percent of outstanding shares. Milchovich and Miller receive the same compensation offered to all directors by the company, and have received additional compensation from Third Point in connection with their agreement to serve as the fund’s director designees. Their agreements with Third Point provided for the following:

- $250,000 in cash upon execution of the agreement;
- $250,000 in cash upon appointment to the board (the agreement required them to invest $250,000 in Dow common shares at the time of appointment - as they both already owned $250,000 worth of shares at the time of appointment, they received $250,000 in cash).
- Stock appreciation rights with respect to 396,668 shares of the company’s common stock, half of which are payable in 2018 and half of which are payable in 2020, subject to continued service as a director on the vesting dates and certain exceptions. The 2018 SARs vest in equal portion on Jan. 1, 2017 and Jan. 1, 2018 and will be settled in cash by Third Point within 30 days following Jan. 1, 2018. The 2020 SARs vest in equal portions on Jan. 1, 2019 and Jan. 1, 2020 and will be settled in cash by Third Point within 30 days following Jan. 1, 2020.

There does not appear to be any provision for accelerated vesting of the SARs in connection with the expected merger with DuPont or the subsequent corporate split, or the directors’ potential loss of board seats in connection with those transactions. No announcement has been made as to the composition of the post-merger boards.

Controversy over third-party compensation for “dissident” directors first arose in 2013 when two separate slates of dissident nominees were offered, in addition to relatively standard fees for agreeing to stand as nominees, incentive compensation tied to the company’s performance should they be elected. None were seated with such arrangements. Nonetheless, a number of boards subsequently adopted bylaw amendments to exclude from board service any individual who received third party compensation to serve. ISS has consistently opposed unilateral bylaw amendments which diminish shareholders’ rights, including the right to choose the directors they believe will best represent their interests, and recommended against re-election of directors who take such unilateral actions.
In reaching a settlement agreement with Third Point to avoid a contest in 2014, the Dow board made no public objection to the third-party incentive compensation arrangements for the directors it agreed to add. Last year’s annual meeting represented the first occasion on which shareholders were asked to re-elect directors who have received third-party incentive compensation for their board service. Milchovich and Miller were re-elected, with support rates in line with the other Dow directors.

In determining their vote on these directors, shareholders should pause to consider certain additional issues which may arise from such compensation arrangements.

A chief objection to these arrangements generally is that they will create a correspondingly special sense of obligation to the dissident shareholder who foots the bill. In this case, however, Third Point appears to have addressed that concern directly by (1) putting the arrangements into a legal contract over which it has no further discretion, including no influence over vesting or payout, and (2) making this a one-time grant with no further expectation of additional grants in the future. Third Point thus has no apparent direct influence on the directors, and has no communications rights with any Dow directors other than those available to all shareholders through the board’s established communications channels. For the directors holding these compensation arrangements, acting in the best interest of all shareholders -- even if not in line with a strategy favored by Third Point -- will have no adverse impact on the vesting or payout of these grants.

Third Point’s willingness to surrender control over these arrangements once the initial agreement was executed, moreover, suggests the fund itself believes any "special obligation" would not only be inappropriate but unnecessary: the cash-settled SARs themselves provide sufficiently meaningful incentive for these directors to ensure the company pursues a value-enhancing strategy. That these directors represent only a minority of the board, and must therefore persuade the other directors of the appropriateness of any strategy they favor, also mitigates any potential risk they might pursue a strategy that subordinates long-term value creation to short-term share price appreciation.

A more substantive concern may be the inherent risk that substantial incentive compensation – whether from the company or a third-party shareholder – could create conflicts of interest for directors whose primary role is oversight, not execution. The former role is not in conflict with the objective of increasing shareholder value but director incentive compensation, as a means to achieve that objective, may potentially come into conflict with directors’ other responsibilities, equally important to shareholders, of ensuring that executives act in the interest of all shareholders rather than their own interests. It should be noted that, in the context of director compensation, the incentive arrangements for these Dow directors are not insubstantial: for every dollar increase in the company’s stock price during the applicable vesting periods, they stand to pocket nearly $400,000.

It is true that all shareholders would benefit from that increase in share price. The question remains whether that performance is better accomplished by providing incentive compensation to executives, rather than to the directors charged with ensuring that compensation structures do not incent inappropriately risky behavior. In the fact pattern at Dow, we note that an unusually-long vesting period appears designed to address any moral hazard risk: the grants are divided into one tranche that vests after the second and third years of the agreement (and pays out after the third), and a second that vests after the fourth and fifth years of the agreement (and pays out after the fifth). Poorly constructed, however, an incentive compensation arrangement for directors – whether provided by the company or a third-party shareholder – could risk realigning the interests of directors away from the long-term interests of all shareholders, and would thus call for continued shareholder scrutiny over the tenure of those directors.

The specific fact pattern at Dow may or may not be repeated in future cases, and our conclusion that these directors merit support should not be interpreted as binding precedent in future cases with different facts. However, in light of the mitigating factors noted above, including the design of these arrangements, the lack of any additional Third Point discretion over vesting or payout, the absence of any suggestion that these particular directors have acted inappropriately or unethically or that their compensation has led to tension in the boardroom, and the recommendation of the full board that shareholders support their reelection, votes for the re-election of directors Milchovich and Miller, as well as for the other nominees, are warranted.
Item 2. Ratify Deloitte & Touche LLP as Auditors

VOTE RECOMMENDATION

A vote FOR this proposal to ratify the auditor is warranted.

BACKGROUND INFORMATION

Policies: Auditor Ratification

Vote Requirement: Majority of votes cast (abstentions are not counted)

Discussion

The board recommends that Deloitte & Touche LLP be approved as the company's independent accounting firm for the coming year.

<table>
<thead>
<tr>
<th>Accountants</th>
<th>Deloitte &amp; Touche LLP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditor Tenure</td>
<td>106 years</td>
</tr>
<tr>
<td>Audit Fees</td>
<td>$22,848,000</td>
</tr>
<tr>
<td>Audit-Related Fees</td>
<td>$6,328,000</td>
</tr>
<tr>
<td>Tax Compliance/Preparation*</td>
<td>$9,230,000</td>
</tr>
<tr>
<td>All Other</td>
<td>$24,000</td>
</tr>
</tbody>
</table>

*Only includes tax compliance/tax return preparation fees. If the proxy disclosure does not indicate the nature of the tax services and provides the fees associated with tax compliance/preparation, those fees will be included in "All Other."

The auditor’s report contained in the annual report is unqualified, meaning that in the opinion of the auditor, the company’s financial statements are fairly presented in accordance with generally accepted accounting principles.

Analysis

This request to ratify the auditor does not raise any exceptional issues, as the auditor is independent, non-audit fees are reasonable relative to audit and audit-related fees, and there is no reason to believe the auditor has rendered an inaccurate opinion or engaged in poor accounting practices.
Item 3. Advisory Vote to Ratify Named Executive Officers' Compensation

VOTE RECOMMENDATION
A vote FOR this proposal is warranted, as pay and performance are reasonably aligned.

BACKGROUND INFORMATION
Policies: Advisory Votes on Executive Compensation

Vote Requirement: Majority of votes cast (abstentions and broker non-votes have no effect)

Executive Compensation Analysis

COMPONENTS OF PAY

<table>
<thead>
<tr>
<th></th>
<th>($ in thousands)</th>
<th>CEO</th>
<th>CEO Peer</th>
<th>Other NEOS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Liveris</td>
<td>A. Liveris</td>
<td>A. Liveris</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,931 0.5%</td>
<td>1,921</td>
<td>1,866</td>
<td>1,588</td>
</tr>
<tr>
<td>Deferred comp &amp; pension</td>
<td>725</td>
<td>7,135</td>
<td>3</td>
<td>1,635</td>
</tr>
<tr>
<td>All other comp</td>
<td>623 52.0%</td>
<td>410</td>
<td>389</td>
<td>379</td>
</tr>
<tr>
<td>Bonus</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Non-equity incentives</td>
<td>5,712 35.0%</td>
<td>4,232</td>
<td>4,559</td>
<td>4,155</td>
</tr>
<tr>
<td>Restricted stock</td>
<td>8,471 0.0%</td>
<td>8,471</td>
<td>7,986</td>
<td>5,475</td>
</tr>
<tr>
<td>Option grant</td>
<td>3,092 -23.6%</td>
<td>4,047</td>
<td>6,505</td>
<td>3,291</td>
</tr>
<tr>
<td>Total</td>
<td>20,554 -21.6%</td>
<td>26,217</td>
<td>21,308</td>
<td>18,437</td>
</tr>
<tr>
<td>% of Net Income</td>
<td>0.3%</td>
<td>0.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Revenue</td>
<td>N/A</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Non-Performance-Based Pay Elements (CEO)

Key perquisites ($)
Personal aircraft use: 446,065; Auto: 19,477; Financial Planning: 52,349; CEO Aggregate Other Perks: 18,627

Key tax gross-ups on perks ($) None

Value of accumulated NQDC* ($) 2,792,030

Present value of all pensions ($) 34,450,363

Years of actual plan service 40.0

Additional years credited service None

*Non-qualified Deferred Compensation

Disclosed Benchmarking Targets

Base salary 50th Percentile
Target short-term incentive 50th Percentile
Target long-term incentive (equity) 50th Percentile
Target total compensation 50th Percentile
Severance/Change-in-Control Arrangements (CEO unless noted)

<table>
<thead>
<tr>
<th>Contractual severance arrangement</th>
<th>Exec Severance Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-CIC estimated severance ($)</td>
<td>3,903,849</td>
</tr>
</tbody>
</table>

Change-in-Control Severance Arrangement

<table>
<thead>
<tr>
<th>Cash severance trigger*</th>
<th>Double trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash severance multiple</td>
<td>2.99 times</td>
</tr>
<tr>
<td>Cash severance basis</td>
<td>Base Salary + Target Bonus</td>
</tr>
<tr>
<td>Treatment of equity</td>
<td>Vest only upon employment termination</td>
</tr>
<tr>
<td>Excise tax gross-up*</td>
<td>Yes, in existing contracts</td>
</tr>
<tr>
<td>Estimated CIC severance($)</td>
<td>57,392,673</td>
</tr>
</tbody>
</table>

*All NEOs considered

Compensation Committee Communication & Responsiveness

Disclosure of Metrics/Goals

<table>
<thead>
<tr>
<th>Annual incentives</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term incentives</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Pay Riskiness Discussion

<table>
<thead>
<tr>
<th>Process discussed?</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material risks found?</td>
<td>No</td>
</tr>
</tbody>
</table>

Risk Mitigators

<table>
<thead>
<tr>
<th>Clawback policy*</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO stock ownership guideline</td>
<td>6X</td>
</tr>
</tbody>
</table>

| Stock holding period requirements | No stock holding period requirements disclosed |

*Must apply to cash incentives and at least all NEOs.

Pledging/Hedging of Shares

<table>
<thead>
<tr>
<th>Anti-hedging policy</th>
<th>Company has a robust policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-pledging policy</td>
<td>Company has a robust policy</td>
</tr>
</tbody>
</table>

Compensation Committee Responsiveness

<table>
<thead>
<tr>
<th>MSOP vote results (F/F+A)</th>
<th>2015: 88.3%; 2014: 78.8%; 2013: 75.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency approved by shareholders</td>
<td>Annual with 49.6% support</td>
</tr>
<tr>
<td>Frequency adopted by company</td>
<td>Annual (year of adoption: 2011)</td>
</tr>
</tbody>
</table>

Repricing History

| Repriced/exchanged underwater options last FY? | No |

Pay for Performance Evaluation

**RELATIVE ALIGNMENT**
The chart plots percentiles of the annualized 3-year performance and pay rankings for the company (▲) and ISS’ derived peers (◆). The gray bar indicates pay and performance alignment.

**ABSOLUTE ALIGNMENT**
CEO granted pay trends versus value of a $100 investment made on the first day of the five-year period.

**PAY MAGNITUDE**
Pay in $thousands. The gray band represents 25th to 75th percentile of CEO pay of ISS’ selected peer group, and the blue line represents the 50th percentile.

The company’s total CEO pay is 1.11 times the median of its peers.

**PAY-FOR-PERFORMANCE QUANTITATIVE SCREEN**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Result</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative degree of alignment</td>
<td>6</td>
<td>Better than 56% of Companies*</td>
</tr>
<tr>
<td>Multiple of peer group median</td>
<td>1.11</td>
<td>Better than 43% of Companies</td>
</tr>
<tr>
<td>Absolute alignment</td>
<td>13</td>
<td>Better than 64% of Companies</td>
</tr>
<tr>
<td>Initial Quantitative Screen</td>
<td>Low</td>
<td>Concern</td>
</tr>
</tbody>
</table>

*Constituents of Russell 3000 Index.
For more information on ISS’ quantitative pay-for-performance measures, visit [http://issgovernance.com/policy/USCompensation](http://issgovernance.com/policy/USCompensation)
### Peer Groups

#### ISS AND COMPANY DISCLOSED PEER GROUPS

<table>
<thead>
<tr>
<th>ISS-Selected Peers (1)</th>
<th>LyondellBasell Industries NV</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M Company</td>
<td>Aron-Daniels-Midland Company</td>
</tr>
<tr>
<td>Caterpillar Inc.</td>
<td>E. I. du Pont de Nemours and Company</td>
</tr>
<tr>
<td>Honeywell International Inc.</td>
<td>Johnson &amp; Johnson</td>
</tr>
<tr>
<td>Johnson Controls, Inc.</td>
<td>PepsiCo, Inc.</td>
</tr>
<tr>
<td>Pfizer Inc.</td>
<td>The Boeing Company</td>
</tr>
<tr>
<td>The Coca-Cola Company Corporation</td>
<td>The Procter &amp; Gamble Company</td>
</tr>
<tr>
<td>Alcoa Inc.</td>
<td>Eli Lilly and Company</td>
</tr>
<tr>
<td>Emerson Electric Co.</td>
<td>General Electric Company</td>
</tr>
<tr>
<td>Lockheed Martin</td>
<td>Monsanto Company</td>
</tr>
<tr>
<td>PPG Industries, Inc.</td>
<td></td>
</tr>
</tbody>
</table>

The shaded area represents the overlap group of companies that are in both ISS' comparison group and the company's disclosed CEO compensation benchmarking peer group. Excludes company peers for which financial data is not available. For more information on the ISS peer group methodology, visit [www.issgovernance.com/policy/USCompensation](http://www.issgovernance.com/policy/USCompensation).

### Short-Term Cash Incentives

<table>
<thead>
<tr>
<th></th>
<th>FY 2015 (A. Liveris)</th>
<th>FY 2014 (A. Liveris)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CEO STI Opportunities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STI targets ($)</strong></td>
<td>Target: 3,185,820</td>
<td>Maximum: 6,371,640</td>
</tr>
<tr>
<td><strong>STI targets (calculated)</strong></td>
<td>165% of base salary</td>
<td>330% of base salary</td>
</tr>
<tr>
<td><strong>STI targets (as disclosed)</strong></td>
<td>165% of base salary</td>
<td></td>
</tr>
<tr>
<td><strong>ISS peer median</strong></td>
<td>168% of base salary</td>
<td></td>
</tr>
<tr>
<td><strong>Company peer median</strong></td>
<td>163% of base salary</td>
<td></td>
</tr>
</tbody>
</table>

#### Actual Payouts ($)

<table>
<thead>
<tr>
<th></th>
<th>FY 2015 (A. Liveris)</th>
<th>FY 2014 (A. Liveris)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bonus</strong></td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Non-equity incentive</strong></td>
<td>$5,712,175</td>
<td>$4,232,314</td>
</tr>
<tr>
<td><strong>Total Bonus + Non-equity</strong></td>
<td>$5,712,175</td>
<td>$4,232,314</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>STI performance metrics/goals</strong></th>
<th>Metric</th>
<th>Form</th>
<th>Weight</th>
<th>Threshold</th>
<th>Target</th>
<th>Maximum</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income</td>
<td>Absolute</td>
<td>60%</td>
<td>$3,553 million</td>
<td>$3,783 million</td>
<td>$4,479 million</td>
<td>$4,054 million</td>
<td></td>
</tr>
<tr>
<td>Management OCF</td>
<td>Absolute</td>
<td>40%</td>
<td>$2,213 million</td>
<td>$3,213 million</td>
<td>$4,213 million</td>
<td>$4,632 million</td>
<td></td>
</tr>
</tbody>
</table>
Other Short-Term Incentive Factors

Performance results adjusted? Net income excludes certain items including asset impairments, restructuring costs, asbestos-related charges, currency devaluation impacts and various one-time gains. Management operating cash flow is net income excluding certain items plus depreciation and amortization minus capital spending and plus the change in adjusted trade working capital.

Discretionary component? Payouts are adjusted in accordance with the committee's assessment of individual performance. The CEO's individual factor in 2015 was 110 percent.

Discretionary bonus:* No

CEO's last FY award ($) 5,712,175 (296% of base salary, or 179% of target)

CEO's last FY award target 165% of base salary

Future performance metrics Not disclosed

*Based on the Bonus column in the SCT; per SEC rules, amounts disclosed in this column were not based on pre-set goals.

Long-Term Incentives

CEO's last FY LTI target (%) None disclosed

NEOs’ last FY award type(s) Performance-based stock, Time-based options, Time-based stock

Most recent performance metrics/goals

<table>
<thead>
<tr>
<th>Metric</th>
<th>Threshold</th>
<th>Target</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROC</td>
<td>10.0%</td>
<td>12.2%</td>
<td>13.7%</td>
</tr>
<tr>
<td>3-year TSR vs. S&amp;P 500 Index</td>
<td>26th percentile</td>
<td>51st percentile</td>
<td>76th percentile</td>
</tr>
</tbody>
</table>

Long-Term Equity Grants

<table>
<thead>
<tr>
<th>CEO Equity Awards</th>
<th>FY 2015</th>
<th>FY 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shares (#)</td>
<td>% shares</td>
</tr>
<tr>
<td>Time-based shares</td>
<td>61,190</td>
<td>13</td>
</tr>
<tr>
<td>Time-based options</td>
<td>312,670</td>
<td>65</td>
</tr>
<tr>
<td>Performance shares</td>
<td>110,140</td>
<td>23</td>
</tr>
<tr>
<td>Performance options</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total equity</td>
<td>484,000</td>
<td></td>
</tr>
</tbody>
</table>

Time-based equity vesting Options: One-third per year
Deferred stock: Cliff vests after 3 years

Perf. measurement period 3 years (FY2015-17)

CEO equity pay mix (by value)* Performance-conditioned: 47.1%; Time-based: 52.9%

*Performance shares, if any, are counted and valued at target.

Other Long-Term Incentive Factors

Performance results adjusted? ROC is calculated as net operating profit after tax (excluding certain items) divided by total average capital.

Discretionary component? No
Executive Summary

<table>
<thead>
<tr>
<th>Evaluation Component</th>
<th>Level of Concern</th>
<th>Key Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Performance-Based Pay Elements</td>
<td>Medium</td>
<td>Significant Perks</td>
</tr>
<tr>
<td>Peer Group Benchmarking</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Severance/CIC Arrangements</td>
<td>Medium</td>
<td>Excise Tax Gross-Up (Legacy)</td>
</tr>
<tr>
<td>Comp Committee Communication/Responsiveness</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Pay for Performance Evaluation</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>ISS Recommendation:</strong></td>
<td><strong>FOR</strong></td>
<td></td>
</tr>
</tbody>
</table>

Analysis

CEO compensation declined nearly 22 percent in 2015, as valued by ISS. However, subtracting the increase in pension value from the 2014 and 2015 totals, the other elements of compensation registered an aggregate 4 percent increase, as an increase in the annual incentive payout outweighed a decline in stock option value, as calculated by ISS. The company's one-year TSR of nearly 17 percent exceeded both those of the GICS peers and the S&P 500 Index. Dow's three- and five-year TSRs also exceed the GICS peers, and three-year TSR exceeds the S&P 500 as well.

Adjusted net income and management operating cash flow targets, used for the short-term incentive program, were set above the targets used in 2014, as well as actual achievement on these metrics in 2014. Performance on the net income metric fell between target and maximum levels, while performance on the OCF target exceeded the level corresponding to a maximum payout. The overall "company component" of 163 percent was multiplied by an "individual factor" of 110 percent to yield a total annual incentive at 179 percent of target.

Other Notable Factors

**Large perquisites.** The company provides a personal use of corporate aircraft perquisite to the CEO, and financial/tax planning perquisites to all NEOs. For the CEO, the amount of compensation related to these perquisites, which in 2015 were provided by only 36 percent and 24 percent of companies in the S&P 500 Index, respectively, significantly exceeded the median value of these perks for executives in the index, and the reported value of the aircraft usage perk more than doubled year-over-year. Investors would benefit from additional disclosure regarding the committee's decision to provide perquisites that far exceed market norms.

**Problematic excise tax gross-up in existing agreement.** The company has legacy arrangements with several executives, including CEO Liveris, which provide for excise tax gross-up payments. Excise tax gross-up provisions lead to substantial increases in potential termination payments, which may encourage executives to negotiate merger agreements that may not be in the best interests of shareholders. Current market practice no longer justifies this type of benefit, and shareholder opposition has led many companies to eliminate such benefits. Given that the problematic provision is contained in an existing arrangement that was not modified in the last fiscal year, this remains a legacy concern. The compensation committee at Dow prohibits new or amended change-in-control agreements, and no new agreements have been executed since 2007.

Conclusion

Notwithstanding the above-mentioned concerns about high perquisite values and legacy excise tax gross-ups, support for this proposal is warranted, as pay and performance are reasonably aligned.
# Item 4. Proxy Access

## VOTE RECOMMENDATION

A vote **FOR** this proposal is warranted, as adoption of proxy access will enhance shareholder rights and this proposal includes appropriate safeguards.

## BACKGROUND INFORMATION

**Policies:** [Proxy Access](#)

**Vote Requirement:** Majority of votes cast (abstentions and broker non-votes have no effect)

## Discussion

**PROPOSAL**

A shareholder has submitted a non-binding proposal requesting that the board adopt a proxy access bylaw. The proposal reads as follows:

"RESOLVED: Shareholders of The Dow Chemical Company ("Dow") ask the board of directors ("Board") to adopt, and present for shareholder approval, a “proxy access” bylaw. The bylaw should require Dow to include in proxy materials prepared for a shareholder meeting at which directors are to be elected the name, Disclosure and Statement (defined below) of any person nominated for election to the board by a shareholder or group ("Nominator") satisfying the criteria below. It should also allow shareholders to vote on such nominee on Dow’s proxy card.

The number of shareholder-nominated candidates appearing in proxy materials should not exceed one quarter of the directors then comprising the Board. This bylaw, which would supplement existing rights, should provide that a Nominator must:

a) have beneficially owned 3% or more of Dow’s outstanding common stock continuously for at least three years;

b) give Dow, within the time period identified in its bylaws, written notice of the information required by the bylaws and any Securities and Exchange Commission rules about (i) the nominee, including consent to being named in the proxy materials and to serving as director if elected; and (ii) the Nominator, including proof it owns the required shares (information required by this subsection (b) is the “Disclosure”); and

c) certify that (i) it will assume liability stemming from any legal or regulatory violation arising out of the Nominator’s communications with Dow shareholders, including the Disclosure and Statement; (ii) it will comply with all applicable laws and regulations if it uses soliciting material other than Dow’s proxy materials; and (c) to the best of its knowledge, the required shares were acquired in the ordinary course of business and not to change or influence control at Dow.

The Nominator may submit a statement not exceeding 500 words in support of each nominee (the “Statement”). The Board shall adopt procedures for promptly resolving disputes over whether notice of a nomination was timely, whether the Disclosure and Statement satisfy the bylaw and applicable rules, and the priority to be given when nominations by multiple Nominators exceed the one-quarter limit."

**PROPONENT’S STATEMENT**

The proponent believes that proxy access is a "fundamental shareholder right that will make directors more accountable and enhance shareholder value." The proponent cites a 2014 study by the CFA Institute concluding that proxy access would "benefit both the markets and corporate boardrooms, with little cost or disruption," and
notes that the terms of the proposed proxy access bylaw "enjoy strong investor support" and have been endorsed by the Council of Institutional Investors.

BOARD'S STATEMENT

The board states that it engaged with "a significant percentage of stockholders" over the past year, and that many of those discussions included the topic of proxy access, but that the views of the company's investors vary, "without consensus on a common set of best practices." The board states that it wants to continue to evaluate proxy access, and how it would interact with the "existing thoughtful and deliberate method of director candidate selection" followed by the governance committee, as well as how proxy access would impact Dow's governance overall, "particularly in the context of the announced pending merger of equals with DuPont." Furthermore, the board notes that Dow has adopted a number of governance practices to "ensure all stockholder interests are represented and protected," including annual director elections, a majority vote standard for director elections, and shareholders' ability to call a special meeting and to suggest director candidates to the governance committee. The board points out as well that six of the 12 independent directors have joined within the last three years.

BACKGROUND ON PROXY ACCESS

Proxy access has been a topic of discussion for decades among the investor and issuer communities, as well as the Securities and Exchange Commission, which finalized a rule in 2010 that required an investor or group of investors to meet an ownership threshold of at least 3 percent of the company's shares continuously for at least the prior three years in order to nominate directors (up to 25 percent of the company's board) who would appear in proxy materials of public companies. That rule was ultimately struck down by the D.C. Circuit Court, leaving access adoption to "private ordering" in the U.S.

In 2015, 91 proxy access shareholder proposals went to a vote and averaged support of 54.8 percent of votes cast. All but one of these proposals mirrored the SEC's standard. Ownership threshold, ownership duration, and the cap on shareholder nominees were the historic focus of shareholders, but investors' views of the appropriate contours of a proxy access bylaw have evolved significantly in the past year. As de facto standards have emerged for the key parameters, shareholders have shifted their attention to other terms and conditions that place restrictions on the ability to use the proxy access right.

In line with institutional investor feedback, ISS generally recommends a vote for management and shareholder proposals with the following provisions:

- **Ownership threshold**: maximum requirement not more than three percent (3%) of the voting power;
- **Ownership duration**: maximum requirement not longer than three (3) years of continuous ownership for each member of the nominating group;
- **Aggregation**: minimal or no limits on the number of shareholders permitted to form a nominating group;
- **Cap**: cap on nominees of generally twenty-five percent (25%) of the board.

ISS will consider the reasonableness of any other restrictions on the right of proxy access, but will generally recommend a vote against proposals that are more restrictive than these guidelines.

### Analysis

<table>
<thead>
<tr>
<th>Form of proposal</th>
<th>Non-binding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership threshold</td>
<td>3 percent of shares outstanding</td>
</tr>
<tr>
<td>Duration threshold</td>
<td>Three years</td>
</tr>
<tr>
<td>Cap on shareholder nominees</td>
<td>25 percent of the board, or 3 directors based on the current board size of 13</td>
</tr>
<tr>
<td>Current market capitalization</td>
<td>$58.8 billion as of April 15, 2016</td>
</tr>
</tbody>
</table>
Implied ownership threshold | $1.8 billion
---|---
Investors currently meeting ownership threshold | Vanguard Group, SSgA Funds Management, BlackRock Fund Advisors
Other provisions | None

**ANALYSIS OF PROPOSED ACCESS RIGHT**

Implementation of this proposal in its current form would enable an individual shareholder or group of shareholders, of any size, that has held at least 3 percent of the company’s voting rights for at least three years to place director candidates in the company’s proxy materials. The proposal is non-binding, so support from holders of a majority of votes cast on this item would not automatically result in a proxy access right for shareholders.

Based on the company’s recent market capitalization of approximately $58.8 million, a 3 percent ownership stake would translate to approximately $1.8 billion. Currently, three large institutional investors meet this ownership threshold and, depending on whether they have held the shares for at least three years, could potentially utilize the proposed access right unilaterally. In the event one or more of these investors were to use the access right to nominate director candidates, those candidates would still need to be elected to the board by shareholders.

The proposal would limit the number of shareholder-nominated candidates appearing in the proxy materials to no more than 25 percent of the board, which would safeguard against a change in board control via proxy access. Following the 2016 annual meeting, there will be 13 directors. Therefore, if the proposal were adopted, no more than three shareholder-nominated candidates could appear on the ballot. The board would have the flexibility to adopt procedures for determining the priority to be given to multiple nominations exceeding the 25 percent limit.

Each nominator would be required to give the company written notice within the time period identified in the company’s bylaws of information that the bylaws and SEC rules require about the nominee and the nominator, including proof of ownership of the required shares. A nominator would be required to make certain certifications, including that the required shares were acquired in the course of business and not to change or influence control at the company. A nominating party would be entitled to submit a brief statement not exceeding 500 words. Further, the board would adopt procedures for resolving disputes over whether the notice of a nomination, disclosure, and statement satisfy the bylaw and any applicable federal regulations.

**GOVERNANCE STRUCTURE**

For investors who may choose to give higher weighting to the company’s corporate governance structure and practices in determining a vote on this proposal, the company has an annually elected board, with a majority vote standard for uncontested director elections and a plurality standard for contested elections. Shareholders have the right to call a special meeting, albeit at a relatively high 25 percent ownership threshold.

**CONCLUSION**

Proxy access, if structured properly, is an important shareholder right. Access complements other best-practice governance features and is standard practice in many markets. A well-crafted proxy access right can provide shareholders with a means of effecting change without incurring the expense of launching a proxy contest.

In this case, the proposed eligibility requirements to use proxy access are robust and the proposal includes safeguards to ensure that the proposed access right would not be used to effect a change of control. Further, the proposal would allow the board to adopt a process for determining which nominees appear on the ballot if numerous shareholders nominate board candidates. Therefore, this item warrants shareholder support.
Equity Ownership Profile

<table>
<thead>
<tr>
<th>Type</th>
<th>Votes per share</th>
<th>Issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Stock</td>
<td>1.00</td>
<td>1,121,830,068</td>
</tr>
</tbody>
</table>

Ownership - Common Stock

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Number of Shares</th>
<th>% of Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Vanguard Group, Inc.</td>
<td>70,516,634</td>
<td>6.31</td>
</tr>
<tr>
<td>SSgA Funds Management, Inc.</td>
<td>44,053,093</td>
<td>3.94</td>
</tr>
<tr>
<td>BlackRock Fund Advisors</td>
<td>42,062,990</td>
<td>3.77</td>
</tr>
<tr>
<td>Capital Research &amp; Management Co. (World Investors)</td>
<td>32,879,668</td>
<td>2.94</td>
</tr>
<tr>
<td>Third Point LLC</td>
<td>25,250,000</td>
<td>2.26</td>
</tr>
<tr>
<td>Capital Research &amp; Management Co. (Global Investors)</td>
<td>16,365,000</td>
<td>1.47</td>
</tr>
<tr>
<td>Wellington Management Co. LLP</td>
<td>13,675,361</td>
<td>1.22</td>
</tr>
<tr>
<td>Northern Trust Investments, Inc.</td>
<td>13,313,627</td>
<td>1.19</td>
</tr>
<tr>
<td>Capital Research &amp; Management Co. (International Investors)</td>
<td>12,624,713</td>
<td>1.13</td>
</tr>
<tr>
<td>Franklin Advisers, Inc.</td>
<td>12,595,870</td>
<td>1.13</td>
</tr>
<tr>
<td>Fidelity Management &amp; Research Co.</td>
<td>10,176,806</td>
<td>0.91</td>
</tr>
<tr>
<td>Glenview Capital Management LLC</td>
<td>9,278,219</td>
<td>0.83</td>
</tr>
<tr>
<td>Geode Capital Management LLC</td>
<td>9,107,639</td>
<td>0.82</td>
</tr>
<tr>
<td>TIAA-CREF Investment Management LLC</td>
<td>8,924,501</td>
<td>0.80</td>
</tr>
<tr>
<td>O2 Management LP</td>
<td>8,871,716</td>
<td>0.79</td>
</tr>
<tr>
<td>SunAmerica Asset Management LLC</td>
<td>7,379,224</td>
<td>0.66</td>
</tr>
<tr>
<td>Bank of America, NA (Private Banking)</td>
<td>7,286,456</td>
<td>0.65</td>
</tr>
<tr>
<td>The Bank of New York Mellon Corp. (Investment Management)</td>
<td>6,974,118</td>
<td>0.62</td>
</tr>
<tr>
<td>Credit Suisse Securities (USA) LLC (Broker)</td>
<td>6,646,822</td>
<td>0.60</td>
</tr>
<tr>
<td>Deutsche Asset &amp; Wealth Management Investment GmbH</td>
<td>6,715,328</td>
<td>0.60</td>
</tr>
</tbody>
</table>

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Additional Information

<table>
<thead>
<tr>
<th>Meeting Location</th>
<th>Midland Center for the Arts, 1801 West St. Andrews, Midland, Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meeting Time</td>
<td>10:00</td>
</tr>
<tr>
<td>Shareholder Proposal Deadline</td>
<td>December 2, 2016</td>
</tr>
<tr>
<td>Solicitor</td>
<td>D.F. King &amp; Co.</td>
</tr>
<tr>
<td>Security IDs</td>
<td>260543103(CUSIP)</td>
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</tbody>
</table>

Publication Date: 19 April 2016

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The Dow Chemical Company
Special Meeting
7.20.2016
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The Dow Chemical Company

Key Takeaways

- The board seeks shareholder approval to merger with E. I. du Pont de Nemours and Company in a transaction structured as a merger of equals.
- DOW shareholders will receive 1.0 share of the combined company and DD shareholders will receive 1.282 shares of the combined company, which will result in current DOW and DD shareholders each owning approximately 50 percent of the combined company.
- Support for this transaction is warranted in light of the strategic rationale, the post-merger leadership structure, and the initial positive market reaction.
- Cash severance arrangements are double triggered and not excessive, and equity will convert into corresponding shares of the combined entity with vesting schedules maintained. No excise tax gross-ups are expected to be paid.

Agenda & Recommendations

<table>
<thead>
<tr>
<th>Item</th>
<th>Code</th>
<th>Proposal</th>
<th>Board Rec.</th>
<th>ISS Rec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M0405</td>
<td>Approve Merger Agreement</td>
<td>FOR</td>
<td>FOR</td>
</tr>
<tr>
<td>2</td>
<td>M0617</td>
<td>Adjourn Meeting</td>
<td>FOR</td>
<td>FOR</td>
</tr>
<tr>
<td>3</td>
<td>M0566</td>
<td>Advisory Vote on Golden Parachutes</td>
<td>FOR</td>
<td>FOR</td>
</tr>
</tbody>
</table>

Shading indicates that ISS recommendation differs from Board recommendation

Items deserving attention due to contentious issues or controversy

Meeting Type: Special
Meeting Date: 20 July 2016
Record Date: 2 June 2016
Meeting ID: 1073486

New York Stock Exchange: DOW
Index: S&P 500
Sector: Diversified Chemicals
GICS: 15101020

Primary Contacts
Andrew Borek
Kurt Groeninger – Compensation
andrew.j.borek@issgovernance.com
Meeting Agenda & Proposals

Item 1. Approve Merger Agreement

VOTE RECOMMENDATION

A vote FOR this proposal is warranted in light of the strategic rationale, the post-merger leadership structure, and the initial positive market reaction.

BACKGROUND INFORMATION

Policies: Mergers and Acquisitions

Vote Requirement: Majority of shares outstanding

Transaction Summary

<table>
<thead>
<tr>
<th>Parties to the Transaction</th>
<th>Company #1</th>
<th>Company #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company:</td>
<td>E. I. du Pont de Nemours and Company</td>
<td>The Dow Chemical Company</td>
</tr>
<tr>
<td>Ticker:</td>
<td>DD</td>
<td>DOW</td>
</tr>
</tbody>
</table>

Valuation

Transaction terms: 1.0 share of the combined company per DOW share 1.282 shares of the combined company per DD share

Type of consideration: Stock – fixed exchange ratio

Equity value at announcement: $61.5 billion

Premium at announcement: (5.6)%*

Premium to two months prior to announcement: 25.3%

Premium to unaffected date (Dec. 8, 2015): 5.7%

Premium to two months prior to unaffected date: 25.4%

Process

Announcement date: Dec. 11, 2015*

Sales process: Partial auction

Board level of support: Unanimous

Special committee: No

*There were media reports on the evening of Dec. 8, 2015 regarding a potential transaction between DOW and DD

Market Context

<table>
<thead>
<tr>
<th></th>
<th>DD</th>
<th>DOW</th>
<th>S&amp;P 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price change at announcement (one-day):</td>
<td>(5.5)%</td>
<td>(2.8)%</td>
<td>(1.9)%</td>
</tr>
<tr>
<td>From Dec. 10, 2015 through June 29, 2016:</td>
<td>(14.2)%</td>
<td>(10.0)%</td>
<td>0.9%</td>
</tr>
<tr>
<td>One-day price change relative to unaffected date:</td>
<td>11.8%</td>
<td>11.9%</td>
<td>(0.8)%</td>
</tr>
<tr>
<td>From unaffected through June 29, 2016:</td>
<td>(4.0)%</td>
<td>(2.9)%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>
Deal Structure

<table>
<thead>
<tr>
<th></th>
<th>DD</th>
<th>DOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termination fee:</td>
<td>$1.9 billion</td>
<td>$1.9 billion</td>
</tr>
<tr>
<td>Percent ownership of combined company:</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Number of board seats on combined company:</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Voting agreement</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Committed shares (percentage of outstanding):</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Fairness Opinion

<table>
<thead>
<tr>
<th></th>
<th>DD</th>
<th>DOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fairness opinion:</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Financial advisor:</td>
<td>Goldman Sachs Evercore Group</td>
<td>The Klein Group Morgan Stanley Lazard Frères</td>
</tr>
<tr>
<td>Total transaction fee:</td>
<td>$80 million</td>
<td>$82.5 million*</td>
</tr>
<tr>
<td>Contingent portion:</td>
<td>$72 million</td>
<td>$67.5 million</td>
</tr>
</tbody>
</table>

*DOW has the option to pay its financial advisors an additional fee of up to $5 million each upon consummation of the transaction.

Discussion

**PROPOSAL**

The board seeks shareholder approval to merge with DD in a transaction structured as a "merger of equals."

DD and DOW will each merge with DowDuPont, a newly-formed corporation. DD shareholders will receive 1.282 shares of DowDuPont per DD share and DOW shareholders will receive 1.0 share of DowDuPont per DOW share, which will result in current DOW and DD shareholders each owning approximately 50 percent of DowDuPont (excluding shares of DOW Series A preferred stock). If outstanding shares of DOW Series A preferred stock are fully converted into DOW common shares prior to the effective date, current DOW shareholders will own approximately 52 percent of DowDuPont, while current DD shareholders will own approximately 48 percent of DowDuPont.

DD CEO Edward Breen will be appointed CEO of DowDuPont, DOW CEO Andrew Liveris will be appointed executive chairman, and the 16-member DowDuPont board will be equally divided between legacy DD and DOW directors.

Following consummation of the merger, DOW and DD intend to pursue a separation of DowDuPont into three independent, publicly-traded companies: a pure-play agriculture business; a pure-play material science business; and a specialty products business.

Neither DOW shareholders nor DD shareholders are entitled to appraisal rights in this transaction.

**STRATEGIC RATIONALE**

The board unanimously approved the merger after considering a number of factors, including:

- The company's operating and financial conditions, business risks, opportunities and prospects as a standalone entity, strategic alternatives to the transaction, industry trends, and the historic price performance of DOW shares;
- The expectation that the combined company will generate annual run-rate cost synergies of $3 billion within two years of closing and achieve approximately $1 billion in growth synergies annually, the achievability of which the board does not believe is dependent upon the consummation of the business separations;
- The belief that the combined company will have improved opportunities for growth, cost savings, and innovation relative to what DOW can achieve on a standalone basis;
The expected synergies and the belief that the combined company will be able to integrate the skill sets and capabilities of each of the companies’ management teams to apply operational and cost discipline, as well as take advantage of strategic and innovation opportunities;

- The belief that the advisory committees established at the closing will effectively advise the DowDuPont board in connection with the process of separating into three independent, publicly-traded companies in transactions that are expected to be tax-efficient for U.S. federal income tax purposes;

- The governance structure of DowDuPont – DOW CEO Liveris will serve as executive chairman, eight of the 16 board members will be DOW designees, one of the two co-lead independent directors will be appointed by DOW, advisory committees will be established to oversee the agricultural, material science, and specialty products businesses, and any changes to the governance structure will require the support of two-thirds of the DowDuPont board;

- The fact that members of DOW management, led by CEO Liveris, will be responsible for the establishment, integration, and operation of the material science business, as well as the establishment, execution, and achievement of related synergies;

- The negotiation process, which included discussions with four potential counterparties, including DD, and the belief that the proposed transaction with DD represented the best reasonably available opportunity to maximize shareholder value;

- The equity consideration, which allows shareholders to participate in the upside potential of the combined company; and

- The opinions delivered by the company’s financial advisors, Morgan Stanley and Lazard, that the merger consideration is fair from a financial standpoint to DOW shareholders.

Analysis

For every M&A analysis, ISS reviews publicly available information and evaluates the merits and drawbacks of the proposed transaction, balancing various factors including, but not limited to, the valuation, market reaction, strategic rationale, negotiations and process, conflicts of interest, and governance. More information

The following analysis may use some or all of the following common acronyms:

- EV - Enterprise Value
- LTM - Last twelve months
- COGS - Cost of goods sold
- EPS - Earnings per share
- DCF - Discounted cash flows
- CAPEX - Capital expenditures
- ROE - Return on Equity
- WACC - weighted avg. cost of capital
- ROIC - return on invested capital
- EBITDA - Earnings before interest, taxes, depreciation & amortization
- SG&A – Sales, general, and administrative expenses
- CAGR – Compound annual growth rate

Valuation

Premium

The transaction was announced by the parties prior to the opening of the markets on Dec. 11, 2015. However, there were media reports on the evening of Dec. 8, 2015 regarding a potential transaction between the parties. As such, Dec. 8, 2015 is the unaffected date.

The consideration for DD shareholders was valued at $70.39 at announcement, which represented a 5.7 percent premium to the Dec. 8 unaffected price and a 5.6 percent discount to the Dec. 10 closing price. DOW share price has declined since announcement, closing at $49.40 on June 29, 2016. Due to the fixed exchange ratios, the implied value of the consideration for DD shareholders also declined to $63.33 on June 29, 2016, a 4.9 percent discount to the unaffected price.

Market Reaction

DOW shares closed at $53.37 on Dec. 11, 2015, 4.9 percent above the unaffected price but 2.8 percent below the prior trading day’s closing price. DD shares closed at $70.44 on Dec. 11, 2015, 5.8 percent above the unaffected...
price but 5.5 percent below the prior trading day’s closing price. The S&P 500 Index declined 1.9 percent on the
date of announcement.

DOW share price has decreased since announcement, closing at $49.40 on June 29, 2016, 2.9 percent below the
unaffected price. DD share price, which is linked to DOW share price due to the fixed exchange ratios, has also
decreased since announcement, closing at $63.94 on June 29, 2016, 4.0 percent below the unaffected price. The
S&P 500 Index closed 0.3 percent above its unaffected date closing price on June 29, 2016.

Exchange Ratio

The DD exchange ratio of 1.282 is based on the midpoint of an exchange ratio derived from the basic share count
each of DOW and DD and an exchange ratio derived from the fully diluted share count of each of DOW and DD
(excluding outstanding shares of Dow Series A preferred stock).

Treatment of Preferred Stock

Each share of DOW Series A preferred stock issued and outstanding immediately prior to the effective time will be
converted into the right to receive one share of DowDuPont Series A preferred stock subject to the same terms as
DOW Series A preferred stock.

Each share of DD preferred stock issued and outstanding immediately prior to the effective time will remain issued
and outstanding, be unaffected by the transaction, and is expected to remain listed on the NYSE.

Fairness Opinions

The exchange ratio (which is fixed at 1.2820x) is in line with the estimates provided in the fairness opinions issued
by Lazard Frères and Morgan Stanley. The Klein Group assisted in preparation of financial analyses but did not
render a fairness opinion.

<table>
<thead>
<tr>
<th>Selected Public Trading Value</th>
<th>Indicative Range</th>
<th>Consideration</th>
<th>Exchange Ratio</th>
<th>Higher/Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0.980x</td>
<td>1.282x</td>
<td>Low End</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.600x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sum of the Parts</th>
<th>Indicative Range</th>
<th>Consideration</th>
<th>Exchange Ratio</th>
<th>Higher/Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.030x</td>
<td>1.282x</td>
<td>High End</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.440x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discounted Cash Flow

<table>
<thead>
<tr>
<th>Lazard</th>
<th>Indicative Range</th>
<th>Consideration</th>
<th>Exchange Ratio</th>
<th>Higher/Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.000x</td>
<td>1.282x</td>
<td>High End</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.500x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Morgan Stanley</th>
<th>Indicative Range</th>
<th>Consideration</th>
<th>Exchange Ratio</th>
<th>Higher/Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0.970x</td>
<td>1.282x</td>
<td>Low End</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.600x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discounted Equity Value (Morgan Stanley)

<table>
<thead>
<tr>
<th>Indicative Range</th>
<th>Consideration</th>
<th>Exchange Ratio</th>
<th>Higher/Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low End</td>
<td>1.140x</td>
<td>1.282x</td>
<td></td>
</tr>
<tr>
<td>High End</td>
<td>1.600x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PROCESS

DOW and DD began exploring a merger of equals in late-May 2015. DOW and DD held numerous prior
engagements to explore strategic transactions, but discussions never advanced to the negotiation phase. Both
DOW and DD also commenced discussions with other third parties in mid-2015. DOW engaged with three third
parties (entering into non-disclosure agreements with two), and DD engaged with two third parties. Neither DOW
nor DD exchanged an offer with a third party that included economic terms during the course of discussions
relating to the proposed transaction. Morgan Stanley, Lazard Frères, and The Klein Group served as DOW's
financial advisors, and Goldman Sachs and Evercore served as DD's financial advisors.

Informal discussions between DOW and DD continued for several months. On Oct. 5, DD announced that Edward
Breen would succeed Ellen Kullman as CEO. DOW CEO Andrew Liveris contacted DD CEO Breen after the
announcement on Oct. 5 to express interest in a transaction, and the parties met on Oct. 11. DD CEO Breen
suggested a merger of equals followed by a separation into three independent companies focused on agricultural
sciences, material sciences, and specialty products, respectively. On Oct. 22, Trian Fund Management privately
suggested three potential strategic alternatives to DD: (1) a merger of DOW and DD followed by a separation into
three public companies, which Trian preferred due to the IRR; (2) a combination of DD's agriculture sciences
business with a strategic partner; and (3) a separation of DD into two public companies. Trian subsequently executed non-disclosure agreements with DD and DOW, and held discussions with both parties relating to the proposed transaction.

DOW indicated that it would consider a merger followed by a split into three entities, with an exchange ratio that would result in an even ownership split between DOW and DD shareholders, a post-transaction board evenly divided between legacy DOW and DD directors, and a management structure in which DD CEO Breen would be the CEO while DOW CEO Liveris would be the executive chairman. DD and DOW executed a non-disclosure agreement on Nov. 24, and DOW delivered an initial draft merger agreement to DD on Dec. 2.

Media reports began circulating on the evening of Dec. 8 regarding a potential transaction. On Dec. 10, the parties agreed to an exchange ratio formula, and the boards of both companies unanimously approved the transaction. The parties announced the transaction prior to the opening of trading the following day.

GOVERNANCE

A QuickScore comparison of key governance provisions indicates DOW shareholders will experience the following changes in shareholder rights if the merger is approved:

<table>
<thead>
<tr>
<th>Company-Specific Provisions</th>
<th>The Dow Chemical Company</th>
<th>DowDuPont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classified Board?</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Poison Pill Threshold?</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Right to Call Special Meetings Threshold?</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Right to Act by Written Consent?</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Chairman Classification?</td>
<td>Insider</td>
<td>Insider</td>
</tr>
<tr>
<td>Vote Standard for Director Elections?</td>
<td>Majority</td>
<td>Majority</td>
</tr>
<tr>
<td>Vote Requirement to Amend Bylaws/Charter?</td>
<td>Majority</td>
<td>Majority*</td>
</tr>
<tr>
<td>Vote Requirement to Approve Business Combinations?</td>
<td>Majority</td>
<td>Majority</td>
</tr>
<tr>
<td>Dual Class Stock?</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Controlling Shareholder?</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*Provisions of the bylaws regarding the executive chairman, the CEO, the board, and the advisory committees may only be amended by the holders of 100 percent of shares outstanding.

Both companies are incorporated in Delaware. State takeover statutes will therefore be unchanged.

Management and Board Composition and Responsibilities

The following management and board appointments will be made at the effective time of the merger:

- DD CEO Edward Breen will be appointed CEO;
- DOW CEO Andrew Liveris will be appointed executive chairman;
- DOW vice chairman and CFO Howard Ungerleider will be appointed CFO;
- DD SVP and general counsel Stacy Fox will be appointed general counsel;
- DD EVP James Collins will be appointed COO, agriculture business;
- DD EVP Marc Doyle will be appointed COO, specialty products business;
- DOW president and COO James Fitterling will be appointed COO, material science business; and
- DOW EVP and general counsel Charles Kalil will be appointed special counsellor to the executive chairman and general counsel for the material science business.

The DowDuPont executive chairman will be responsible for the following:

- Chairing the board, as well as the agenda and schedule of board meetings (in consultation with the CEO);
Corporate-wide synergies (together with the CEO and in consultation with James Fitterling or his successor);
External representation with all stakeholders, other than with respect to investor relations matters, and with respect to media relations matters (which will be the joint responsibility of the executive chairman and the CEO);
The establishment, integration, and operation of the material science business;
The annual strategic plans for the material science business and the establishment, execution, and achievement of related synergies (in each case with the assistance of the CEO); and
New opportunities for the specialty products business (together with the CEO).

The DowDuPont CEO will be responsible for the following:

- The financial affairs of DowDuPont, including the integration, ongoing operation, and performance of the company (in consultation with Andrew Liveris with respect to the material science business);
- Corporate-wide synergies (together with the executive chairman and in consultation with James Fitterling or his successor);
- The agenda and schedule of board meetings (together with the executive chairman);
- For investor relations matters, and for media relations matters (which will be the joint responsibility of the executive chairman and the CEO);
- The establishment, integration, and operation of the agricultural and specialty products businesses;
- The annual strategic plans for the agricultural and specialty products businesses and the establishment, execution, and achievement of related (in each case with the assistance of the executive chairman); and
- New opportunities for the specialty products business (together with the executive chairman).

At the effective time of the merger, the DowDuPont board will consist of 16 directors, eight of whom will be designated by DOW from the DOW board (one of whom will be Andrew Liveris and one of whom will be the independent lead director of DOW), and eight of whom will be designated by DD from the DD board (one of whom will be Edward Breen and one of whom will be the independent lead director of DD). The board will establish advisory committees to oversee the business and affairs of the agricultural, material science, and specialty products businesses in preparation for the intended business separations.

CONCLUSION

The deal is structured as a merger of equals. Given that mergers of equals can lack a meaningful control premium, they can pose unique questions to shareholders and often necessitate additional focus on the governance of the combined entity, post-merger ownership and contribution analysis, the strategic rationale, and the negotiation process. The DOW board expects the combined company to generate annual run-rate cost synergies of $3 billion within two years of closing and achieve approximately $1 billion in growth synergies annually. The board also believes that the combined company will have improved opportunities for growth, cost savings, and innovation relative to what DOW can achieve on a standalone basis, and that the transaction represented the best reasonably available opportunity to maximize shareholder value. DOW CEO Andrew Liveris will be the executive chairman of DowDuPont, half of the DowDuPont board will be composed of current DOW directors, and one of the two independent co-lead directors will be appointed by DOW.

DD shareholders will receive 1.282 shares of DowDuPont per DD share and DOW shareholders will receive 1.0 share of DowDuPont per DOW share, which will result in current DOW and DD shareholders each owning approximately 50 percent of DowDuPont (DD shareholders will own approximately 48 percent of DowDuPont if DOW Series A preferred shares are fully converted). The implied value of the consideration for DD shareholders was $70.39 at announcement. Although share price decreased at announcement, initial market reaction to media reports of a potential transaction was positive, and DD shares closed 5.8 percent above the unaffected price on the date of announcement. Shares have since declined slightly, to make the market value of the consideration $63.33 on June 29, 2016, a 4.9 percent discount to the unaffected price.

Given the strength of the strategic rationale, support for this proposal is warranted.
## Item 2. Adjourn Meeting

**VOTE RECOMMENDATION**
A vote FOR this proposal is warranted, as support for the underlying transaction is warranted.

**BACKGROUND INFORMATION**
Policies: Adjourn Meeting

**Vote Requirement:** Majority of votes cast (abstentions not counted)

**Discussion**
The board seeks shareholder approval to adjourn the meeting, if necessary, to permit the further solicitation of proxies if there are insufficient votes at the time of the meeting to approve the transaction.

## Item 3. Advisory Vote on Golden Parachutes

**VOTE RECOMMENDATION**
A vote FOR this proposal is warranted. Liveris is expected to receive cash severance and acceleration of equity upon his departure from the company in 2017. These change-in-control payments are reasonable given that Liveris will not serve as CEO of the combined company and his resignation will come within 24 months of the change in control. Finally, while Liveris is eligible to receive an excise tax gross-up, it is not expected to be paid.

**BACKGROUND INFORMATION**
Policies: Voting on Golden Parachutes in an Acquisition, Merger, Consolidation, or Proposed Sale

**Vote Requirement:** Majority of votes cast (abstentions not counted)

**Discussion**

**PROPOSAL**
The board seeks shareholder approval, on an advisory, non-binding basis, of the compensation arrangements for its named executive officers ("NEOs") that are based on or related to the transaction.

This proposal is advisory in nature and the vote outcome has no effect on the merger proposal.
SEVERANCE/CHANGE-IN-CONTROL ARRANGEMENTS

The company discloses the following change-in-control arrangements for NEOs:

<table>
<thead>
<tr>
<th></th>
<th>CEO A. Liveris</th>
<th>Other NEOs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Severance Trigger:</strong></td>
<td>Double trigger</td>
<td>Double trigger</td>
</tr>
<tr>
<td><strong>Severance Multiple:</strong></td>
<td>2.99</td>
<td>2</td>
</tr>
<tr>
<td><strong>Severance Basis:</strong></td>
<td>Base Salary + Target Bonus</td>
<td>Base Salary + Target Bonus</td>
</tr>
<tr>
<td><strong>Equity Treatment (Time-based):</strong></td>
<td>Converted into equity of combined entity one-for-one, with vesting terms maintained.</td>
<td>Converted into equity of combined entity one-for-one, with vesting terms maintained.</td>
</tr>
<tr>
<td><strong>Equity Treatment (Perf-conditioned):</strong></td>
<td>Converted into time-vesting equity of combined entity. Awards vest at end of original performance period at the greater of target level or actual level of performance.</td>
<td>Converted into time-vesting equity of combined entity. Awards vest at end of original performance period at the greater of target level or actual level of performance.</td>
</tr>
<tr>
<td><strong>Excise Tax Gross-up:</strong></td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Perks/Benefits:</strong></td>
<td>Continuation of health and welfare benefits for 18 months following termination. Three additional years of service and age credit for purposes of retirement benefits. $50,000 in outplacement, tax, and financial planning assistance.</td>
<td>Continuation of health and welfare benefits for 18 months following termination. Two additional years of service and age credit for purposes of retirement benefits. $50,000 in outplacement, tax, and financial planning assistance.</td>
</tr>
<tr>
<td><strong>Other Payments:</strong></td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

ESTIMATED GOLDEN PARACHUTE BENEFITS

The table below summarizes the company’s disclosure regarding amounts payable related to the proposed change in control, assuming that the transaction was completed and the NEOs were terminated on March 31, 2016, and were entitled to full benefits under their respective agreements, based on the $50.49 per share cash consideration:

<table>
<thead>
<tr>
<th>Executives</th>
<th>Cash</th>
<th>Equity</th>
<th>Pension/NQDC</th>
<th>Perks/Benefits</th>
<th>Tax Reimbursement</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO A. Liveris</td>
<td>$15,298,694</td>
<td>$29,204,136</td>
<td>$1,231,116</td>
<td>$62,249</td>
<td>N/A</td>
<td>--</td>
<td>$45,796,195</td>
</tr>
<tr>
<td>Other NEOs in aggregate</td>
<td>$8,396,376</td>
<td>$35,646,784</td>
<td>$143,711</td>
<td>$149,081</td>
<td>N/A</td>
<td>--</td>
<td>$44,335,952</td>
</tr>
<tr>
<td><strong>Total NEOs</strong></td>
<td><strong>$23,695,070</strong></td>
<td><strong>$64,850,920</strong></td>
<td><strong>$1,374,827</strong></td>
<td><strong>$211,330</strong></td>
<td><strong>N/A</strong></td>
<td><strong>--</strong></td>
<td><strong>$90,132,147</strong></td>
</tr>
</tbody>
</table>

**Analysis**

ISS' case-by-case evaluation related to the advisory vote on golden parachutes takes into account new and existing features and practices. For this purpose, we particularly scrutinize whether the company’s arrangements include multiple problematic features. Recent amendments that incorporate problematic features will tend to carry more weight on the overall analysis. However, the presence of multiple legacy problematic features will also be closely scrutinized.

**Cash severance is double triggered and not excessive.** Executive CIC agreements provide for a lump sum cash severance payment only in conjunction with a qualifying termination following the change in control. Several of
the NEOs, including CFO Ungerleider, COO Fitterling, and GC Kalil, will continue employment with the combined entity.

**CEO Liveris to receive severance no later than June 30, 2017.** Upon completion of the merger, CEO Liveris will serve as Executive Chairman of DowDuPont; the CEO of DuPont will continue as the CEO of the combined company. However, according to an 8-K published on Feb. 2, 2016, Liveris will "transition out" of the company on the earlier of the "material completion of the anticipated spins following closing of the announced DowDuPont merger transaction or June 30, 2017." Footnote 2 of the Golden Parachute Compensation table also indicates that the transition will constitute good reason under Liveris' CIC Agreement and will entitle him to receive the severance cash payments. As such, Liveris is expected to receive approximately $15.3 million in cash severance upon the termination of his employment no later than June 30, 2017.

**Excise tax gross-ups are not expected to be paid.** The Dow CIC Agreements provide for excise tax gross-up entitlements, although, according to the Golden Parachute Compensation table, no such gross-ups are expected to be paid in connection with the CIC.

**Equity will convert into awards of the combined company.** NEOs' time-based awards will convert into corresponding DowDuPont equity awards with vesting terms maintained. Performance-conditioned awards will convert into time-based DowDuPont awards with vesting to occur at the expiration of the original performance period, at the greater of target and actual performance.

NEOs' unvested equity awards will accelerate in the event of a resignation for good reason following the CIC. It is expected that Liveris' unvested equity will accelerate upon his transition from the combined company.

**Pension benefits may accelerate at the time of merger.** Dow maintains a pension benefits plan for certain NEOs, including Liveris. In the event of a change in control, the vested and accrued benefits will become payable as a lump sum. However, Dow has implemented a voluntary program under which each participant may elect to contribute a post-tax pension payout into a commercial annuity, purchased by Dow at an additional cost on the participants' behalf. The annuity includes a tax equalization payment "intended to put the participant in a substantially comparable post-tax position as if the payout had not been made in a lump sum." Any participant who declines to participate in the annuity program will receive a lump sum distribution of the pension benefit within 90 days of the change in control. According to the merger proxy, it is unclear whether any NEOs will select the annuity option or not. If Liveris selects the annuity option, the incremental cost to Dow to purchase the annuity would be $14.2 million (includes the tax equalization payment). Note that the vested portion of Liveris' pension benefit is approximately $40 million.

**CONCLUSION**

Support for this proposal is warranted. NEOs' potential cash severance is double triggered and not excessive, and equity will convert into corresponding shares of the combined entity with vesting terms maintained. Moreover, Liveris' cash severance will not be paid until his expected departure from the company in 2017 (i.e. double trigger). Finally, while there are excise tax gross-up entitlements, no such gross-ups are expected to be paid in connection with the transaction.
Equity Ownership Profile

<table>
<thead>
<tr>
<th>Type</th>
<th>Votes per share</th>
<th>Issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Equity</td>
<td>1.00</td>
<td>1,121,830,068</td>
</tr>
</tbody>
</table>

Additional Information

- **Meeting Location**: Employee Development Center
  Dow Corporate Center
  Midland, Michigan 48674

- **Meeting Time**: 10:00 a.m., local time

- **Shareholder Proposal Deadline**: Dec. 2, 2016

- **Solicitor**: D.F. King & Co.

- **Security IDs**: 260543103(CUSIP)
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TAB 19
Moving Forward to Better Serve Our Members

Overview of the Texas Budget Process, Don Green, Chief Financial Officer
Legislative Landscape, Merita Zoga, Director of Governmental Relations
Texas Budgeting Timeline

Even Year; 2016

- Feb - March: Strategic Planning Instructions to Agencies
- Mar - May: Negotiate Structure and Measure Changes
- May: Biennial Budget Request Instructions sent
- June - July: Agencies Submit Strategic Plans
- July - August: Agencies Submit Budget Requests (LARs)
- August - Sept: GOBPP/LBB Joint Budget Hearings
- November: LBB meets to adopt a spending limit
- Sept - Dec: LBB and GOBPP Budget Preparations
Texas Budgeting Timeline

Odd Year; 2017

- January: LBB submits budget estimates to 85th Leg
- January: Comptroller releases Biennial Revenue Estimate
- February: Governor delivers budget by State of the State
- Jan - April: House and Senate produce appropriations bill
- May: Legislature adopts final appropriations bill
- June: Comptroller certifies appropriations bill
- June: Governor signs bill with line item vetoes
- June - August: Agencies develop Budgets for FY 2018
- September: New fiscal year begins for FY 2018
The Budget Players

- **Legislative Budget Board**
  - Adopts a constitutional spending limit
  - Prepares a general appropriations bill
  - Prepares agency performance reports
  - Prepares, fiscal notes identifying the probable costs of proposed legislation and impact statements

- **Comptroller of Public Accounts**
  - Submits the *Biennial Revenue Estimate* (BRE)
  - Certifies the appropriations bill by determining whether appropriations are within available revenue
  - Collects state taxes, tracks revenue and spending funds
The Budget Players

- **Office of the Governor**
  - Involved in the budget process beginning with strategic planning and ending with budget execution
  - Provides overall vision, mission, and philosophy, as well as statewide goals and benchmarks
  - Has line-item veto power

- **State Auditor’s Office**
  - Serves as independent auditor of state agencies, including institutions of higher education
  - Audits the accuracy of reported performance measures and assesses the related internal controls
**FY 2016-17 State Budget Overview, Total = $213.7B**

**Sources of Funds**
- General Revenue 50%
- Federal Funds 33%
- Other Funds 13%
- General Revenue Dedicated 4%

**Uses of Funds**
- Education 37%
- Health and Human Svs 37%
- Economic Dev 14%
- Public Safety 6%
- Other 6%

TRS represents 4.4% of total GR Budget, $4.5 billion.
Constitutional Spending Limits

• **Pay-As-You-Go Limit**: Requires bills making appropriations be sent to the Comptroller of Public Accounts (CPA) for certification

• **Limitation on the Growth of Certain Appropriations**: Limits the biennial growth of appropriations from state tax revenue not dedicated by the Constitution to the estimated rate of growth of the state’s economy (8%)

• **Welfare Spending Limit**: Provides the amount that may be paid out of state funds for assistance grants not exceed 1 percent of the state budget in any biennium

• **Debt Limit**: Limits the authorization of additional state debt, if in any fiscal year, the resulting annual debt service payable from unrestricted GR exceeds 5 percent of the average annual unrestricted GR funds for the previous three years
Comptroller Biennial Revenue Estimate (BRE)

Tax Collections 2018-19 Estimated %

Sales Tax $62.2 58%
Vehicle Sales, Rental and Fuel Taxes $17.2 16%
Franchise Taxes $7.8 7%
Natural Gas and Oil Production Taxes $6.4 6%
Other Taxes $13.2 13%
Total Tax Collections $106.8

Note: Other Taxes includes cigarette/tobacco and alcoholic beverages, hotel occupancy and insurance taxes.
Rainy Day Fund

- Constitutional fund created by the voters in 1988
- Proposition 1 approved by voters in November 2014 modified the calculation of transfers to the ESF
- When collections are sufficient, the fund receives an amount of GR equal to at least 37.5%, but no more that 75% of oil production and natural gas production tax collections in excess of 1987 levels plus one-half of unencumbered GR funds balance at end of each biennium.

### Revenue Available for General Purpose Spending

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Revenue-Related (GR-R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues from Sales Taxes (Before allocation to State Highway Fund)</td>
<td>$56.83</td>
<td>$61.97</td>
</tr>
<tr>
<td>Sales Taxes Allocated to State Highway Fund</td>
<td>$0.0</td>
<td>$4.71</td>
</tr>
<tr>
<td><strong>Net GR-R Revenues from Sales Taxes</strong></td>
<td>$56.83</td>
<td>$57.26</td>
</tr>
<tr>
<td>Other GR-R Revenues</td>
<td>$45.61</td>
<td>$49.21</td>
</tr>
<tr>
<td><strong>Total GR-R Revenues</strong></td>
<td>$102.45</td>
<td>$106.47</td>
</tr>
<tr>
<td>Beginning Balance (Funds carried forward from 2016)</td>
<td>$7.29</td>
<td>$1.53</td>
</tr>
<tr>
<td><strong>Total GR-R Revenue &amp; Fund Balances</strong></td>
<td>$109.73</td>
<td>$108.00</td>
</tr>
<tr>
<td>Revenue Reserved for Transfers to the Economic Stabilization and State Highway Funds</td>
<td>$2.0</td>
<td>$3.13</td>
</tr>
<tr>
<td><strong>Total Revenue Available for General-Purpose Spending</strong></td>
<td>$107.73</td>
<td>$104.87</td>
</tr>
</tbody>
</table>
# Major Budget Drivers, 2004 and 2016

**Budget Drivers:** Economic, demographic, or legal factors and trends that, absent intervening changes to state/federal policy or law, will influence funding increases (or decreases) to programs that comprise the state budget.

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2016</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg Daily Attendance – Public Schools</td>
<td>4,000,000</td>
<td>4,900,000</td>
<td>23%</td>
</tr>
<tr>
<td>Fall Headcount Enrollment – Universities</td>
<td>482,123</td>
<td>619,175</td>
<td>28%</td>
</tr>
<tr>
<td>Fall Headcount Enrollment – Community/Junior Colleges</td>
<td>539,017</td>
<td>715,179</td>
<td>33%</td>
</tr>
<tr>
<td>Avg Monthly Caseload – Medicaid Clients</td>
<td>2,700,000</td>
<td>4,100,000</td>
<td>52%</td>
</tr>
<tr>
<td>Avg Inmate Population – Dept of Criminal Justice</td>
<td>148,896</td>
<td>147,590</td>
<td>-1%</td>
</tr>
</tbody>
</table>

Source: Legislative Budget Board
FY 2018-19 Biennial Recommendations, Senate Bill 1

- The introduced LBB budget for TRS totals $4.8 billion in all funds and $4.5 billion in general revenue
- This represents 2.3% of the state’s all funds budget and 4.4% of the general revenue budget
- Funded 6.8% state contribution rate
- Funded 1.0% state contribution rate for TRS Care with updated covered salary projections

All Funds $213,371.6

- Agencies of Education, $79,303.9, 37.2%
- Health and Human Services, $77,373.1, 36.3%
- Business and Economic Development, $33,398.2, 15.7%
- Natural Resources, $4,321.8, 2.0%
- The Judiciary, $800.1, 0.4%
- Public Safety and Criminal Justice, $12,331.5, 5.8%
- The Legislature, $387.9, 0.2%
- General Provisions, ($1,058.0), -0.5%
- General Government, $5,886.6, 2.6%

- The introduced LBB budget for TRS totals $4.8 billion in all funds and $4.5 billion in general revenue
- This represents 2.3% of the state’s all funds budget and 4.4% of the general revenue budget
- Funded 6.8% state contribution rate
- Funded 1.0% state contribution rate for TRS Care with updated covered salary projections
The introduced LBB budget for TRS totals $4.8 billion in all funds and $4.5 billion in general revenue.

This represents 2.2% of the state’s all funds budget and 4.1% of the general revenue budget.

Funded 6.8% state contribution rate.

Funded 1.0% state contribution rate for TRS Care with updated covered salary projections.
FY 2018-19 Biennial Recommendations

Senate Bill 1
GR and GR Dedicated
$110,495.6

- Agencies of Education, $57,568.9, 52.1%
- Health and Human Services, $33,746.4, 30.5%
- The Judiciary, $636.3, 0.6%
- Public Safety and Criminal Justice, $11,590.2, 10.5%
- Natural Resources, $2,162.9, 2.0%
- Business and Economic Development, $1,035.2, 0.9%
- Regulatory, $592.0, 0.5%
- The Legislature, $387.7, 0.4%
- General Provisions, $(1,058.0), -1.0%
- General Government, $3,834.0, 3.5%

House Bill 1
GR and GR Dedicated
$115,893.9

- Agencies of Education, $59,838.4, 51.7%
- Health and Human Services, $35,670.4, 30.8%
- The Judiciary, $641.5, 0.6%
- Public Safety and Criminal Justice, $11,499.9, 9.9%
- Natural Resources, $11,499.9, 9.9%
- Business and Economic Development, $1,047.4, 0.9%
- Regulatory, $596.7, 0.5%
- General Government, $3,867.5, 3.3%
- The Legislature, $384.1, 0.3%
- Agencies of Education, $59,838.4, 51.7%

- Senate & House removed Rider 15: Legislative intent relating to retiree health insurance premiums
- House: Added Rider 18: TRS-Care shortfall. It is the intent of the Legislature that resolving the long-term solvency of TRS-Care be a shared fiscal responsibility
## FY 2018-19 LBB Budget Recommendations Senate Bill 1

<table>
<thead>
<tr>
<th>Method of Finance</th>
<th>2016-17 Adjusted Base</th>
<th>2018-19 Senate Bill 1</th>
<th>Biennial $ Change</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Revenue</td>
<td>$106,848.7</td>
<td>$103,602.3</td>
<td>($3,246.3)</td>
<td>(3.0%)</td>
</tr>
<tr>
<td>GR-Dedicated</td>
<td>$8,036.0</td>
<td>$6,893.3</td>
<td>($1,142.7)</td>
<td>(14.2%)</td>
</tr>
<tr>
<td>Federal Funds</td>
<td>$70,605.7</td>
<td>$71,006.4</td>
<td>$400.7</td>
<td>0.6%</td>
</tr>
<tr>
<td>Other Funds</td>
<td>$28,177.7</td>
<td>$31,869.6</td>
<td>$3,691.8</td>
<td>13.1%</td>
</tr>
<tr>
<td><strong>All Funds</strong></td>
<td><strong>$213,668.2</strong></td>
<td><strong>$213,371.6</strong></td>
<td><strong>($296.5)</strong></td>
<td><strong>(0.1%)</strong></td>
</tr>
</tbody>
</table>

Source: Legislative Budget Board
• 100% of funding comes from pension trust fund – not GR.

• $3.9 million for 25 additional FTEs based on workload demand
  • 10 benefits counselors to reduce call wait times and provide more counseling appointments
  • 7 IT developers to support applications created during TEAM program
  • 2 investment staff for investment operations
  • 6 support staff in audit, legal and communications

• **Capital Budget Items**
  • $25.1 million for TEAM
  • $ 4.8 million for CAPPS implementation
  • $ 4.0 million for building renovations
  • $ 2.0 million for telephone counseling center system upgrade
  • $ 3.4 million for PC refresh, data center and network infrastructure upgrades
Exceptional Item Request for TRS-Care

- $1.35 billion exceptional request to provide for fiscal solvency through the end of fiscal year 2019.

- The most recent estimate is $1.1 billion as of 08/31/2016.
• Modification of TEAM rider to allow for the transition of TEAM FTEs from TEAM to the operating budget during a post-TEAM phase.

• Renaming the incentive compensation pay rider to the performance pay plan with the intent to clarify that the plan rewards extraordinary performance.
TRS cannot advocate or influence legislation

Gov’t Code § 821.008. PURPOSE OF RETIREMENT SYSTEM. The purpose of the retirement system is to invest and protect funds of the retirement system and to deliver the benefits provided by statute, not to advocate or influence legislative action or inaction or to advocate higher benefits.

Gov’t Code § 825.215. ADVOCACY PROHIBITED. An employee of the retirement system may not advocate increased benefits or engage in activities to advocate or influence legislative action or inaction. Advocacy or activity of this nature is grounds for dismissal of an employee.

Gov’t Code § 825.315. PROHIBITED USE OF ASSETS. (a) Assets of the retirement system may not be used to advocate or influence the outcome of an election or the passage or defeat of any legislative measure. This prohibition may not be construed to prevent any trustee or employee from furnishing information in the hands of the trustee or employee that is not considered confidential under law to a member or committee of the legislature, to any other state officer or employee, or to any private citizen, at the request of the person or entity to whom the information is furnished. This prohibition does not apply to the incidental use of retirement system facilities by groups of members or retirees or by officers or employees of state agencies.

These sections do not prohibit the use of system assets by an employee of the retirement system to comment on federal laws, regulations, or other official actions or proposed actions affecting or potentially affecting the retirement system that are made in accordance with policies adopted by the board.
• Over 130 years experience working directly with the Texas Legislature.

• Many key TRS personnel from Legal, Benefits, Finance, and other divisions provide valuable expertise in analyzing legislation.

• Review and monitor more than 6,000 bills/joint resolutions typically filed and analyze 400 TRS-related bills plus amendments.
Key Participants in the Legislative Process

- Members and Retirees
- Governor, Lt. Governor, Speaker, and the Legislature
- Committees
  - Senate State Affairs- Senator Joan Huffman
  - House Pensions Committee- Representative Dan Flynn
  - Senate Finance- Senator Jane Nelson
  - House Appropriations- Representative John Zerwas
- Member and Retiree Associations
Key Participants in the Legislative Process

- Other agencies
  - Legislative Budget Board
  - Other Funds - four statewide systems (including ERS), UTIMCO
  - Pension Review Board
  - State Auditor
  - Comptroller

- Congress

- National Associations
  - NASRA – National Association of State Retirement Administrators
  - NCTR – National Conference on Teacher Retirement
  - NIRS – National Institute on Retirement Security

- Special Interest Groups
The Governor has three options: sign the bill into law, allow the bill to become law without a signature, or veto the bill.

Bills filed during 84th Legislature

- Filed in both House and Senate: 6,476
- Passed Both Chambers & Sent to the Governor: 1,330
  - Signed by Governor: 1,119
  - Law without signature: 170
  - Vetoed by Governor: 41

Approximately 20% of the bills made it through the legislative process.
**85th Legislative Session**

**85th Legislature, Regular Session**

*Deadlines for Action Under House and Senate Rules*

This deadlines calendar is intended to be a practical summary guide to the end-of-session deadlines. It is not intended as an interpretation of the rules of the House or Senate.

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td>118th day</td>
<td>119th day</td>
<td>120th day</td>
<td>121st day</td>
<td>122nd day</td>
<td>123rd day</td>
<td>124th day</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Last day for House committees to report bills</td>
<td>Last day for House to consider Local Calendar with bills</td>
<td>Last day for House to consider Local Calendar with bills</td>
<td>Last day for Senate to consider Local Calendar with bills</td>
<td>Last day for House to consider Local Calendar with bills</td>
<td>Last day for House to consider Local Calendar with bills</td>
<td>Last day for House to consider Local Calendar with bills</td>
</tr>
<tr>
<td>(See Note 1)</td>
<td>(See Note 2)</td>
<td>(See Note 1)</td>
<td>(See Note 2)</td>
<td>(See Note 2)</td>
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<td>(See Note 1)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>125th day</th>
<th>126th day</th>
<th>127th day</th>
<th>128th day</th>
<th>129th day</th>
<th>130th day</th>
<th>131st day</th>
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<tbody>
<tr>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Last day for bills to be introduced</td>
<td>Last day for House Local &amp; Consent Calendar with bills must be distributed</td>
<td>Last day for House to consider Local Calendar with bills must be distributed</td>
<td>Last day for Senate to consider Local Calendar with bills must be distributed</td>
<td>Last day for House to consider Local Calendar with bills must be distributed</td>
<td>Last day for Senate to consider Local Calendar with bills must be distributed</td>
<td>Last day for House committees to report bills</td>
</tr>
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<td>(See Note 2)</td>
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<td>(See Note 1)</td>
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<table>
<thead>
<tr>
<th>132nd day</th>
<th>133rd day</th>
<th>134th day</th>
<th>135th day</th>
<th>136th day</th>
<th>137th day</th>
<th>138th day</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
</tr>
<tr>
<td>By 10 a.m. — Last House Daily Calendar with bills must be distributed (30-hour layout)</td>
<td>By 9 a.m. — Last House Local &amp; Consent Calendar with bills must be distributed (48-hour layout)</td>
<td>Last day for House to consider Local Calendar with bills</td>
<td>Last day for Senate to consider Local Calendar with bills</td>
<td>Before midnight — Senate amendments must be in print and distributed (14-hour layout)</td>
<td>Before midnight — Senate amendments must be in print and distributed (14-hour layout)</td>
<td>Before midnight — Senate amendments must be in print and distributed (14-hour layout)</td>
</tr>
<tr>
<td>(See Note 2)</td>
<td>(See Note 2)</td>
<td>(See Note 1)</td>
<td>(See Note 1)</td>
<td>(See Note 1)</td>
<td>(See Note 1)</td>
<td>(See Note 1)</td>
</tr>
</tbody>
</table>

In reviewing this calendar, all members should consider, in addition to the stated deadline, the time needed for the preparation of any ancillary documents related to the bill, any printing time, and any applicable layout time.

Note 1: The House rules do not contain an express deadline for the committees to report measures. However, technically, this is the last day for a House committee to report a measure in order for the measure to have any chance of being voted on by the House calendar. However, this deadline does not in any way affect consideration time as required by House rule (1.2) or print and distribute an updated fiscal note or impact statement (1.3) prepare any other paperwork required for a committee report (1.4) print the committee report and distribute it to the members of the House. This is required by the rules. Instead, it typically takes a full day or more for a bill to reach the Calendars Committee after the bill has been reported from committee.

Note 2: The House rules do not have an express deadline for distributing calendars on the 12th, 121st, 128th, 127th, and 123rd days.

Note 3: The Senate deadline for passing all bills and joint resolutions does not affect consideration of House deadlines for passing Senate bills and joint resolutions. Additionally, to be eligible for consideration by the House under its end-of-session deadlines, Senate bills and joint resolutions must be passed by the Senate and received by the House before the 120th day.

Note 4: Both House and Senate rules require a 48-hour layout for a resolution suspending limitations on the conference committee considering the general appropriations bill, if such a resolution is necessary. Senate rule has an express deadline for considering first resolution, which should occur before consideration of the general appropriations bill.
Anticipated TRS-related Legislation

- TRS-Care and TRS ActiveCare

- TRS Omnibus legislation
  - IRS/technical cleanup issues
  - Agency Administration
  - Investments
TAB 23
Moving Forward
to Better Serve Our Members

Value-Based Purchasing in Health Care, Katrina Daniel, Health and Insurance Benefits
746,000: Combined total participants
$3.9 billion: Combined total expenditures for claims, premiums, and administration

**TRS-Care**
- 262,000 participants
  - 156,000 Standard Plan
  - 106,000 Medicare Advantage
- $776 million in medical claims
- $716 million in pharmacy claims
- $6,370 average per member per year costs

**TRS-Active Care**
- 484,000 participants
  - 428,000 ActiveCare PPO
  - 56,000 HMO enrollees
- $1.4 billion in medical claims
- $325 million in pharmacy claims
- $6,311 average per member per year costs
Non-Medicare retirees cost TRS up to four times more than Medicare-eligible participants because Medicare pays 80% of their costs, TRS is secondary.
TRS-Care Fund Balance Projection through FY2021 as of December 31, 2016
Contributions
Fiscal Year

State Contributions

Retiree Contributions

Supplemental
Appropriations

Active Employee
Contributions

Expenditures

District Contributions

Investment Income

CMS& Part D Subsidies

ERRP Subsidy

Medical Incurred

Medicare Advantage
Premiums

Drug Incurred

Administrative Costs

Ending Balance (Incurred
Basis)

FY 1986

$0

$0

$250,000

$17,625,194

$0

$572,153

$0

$0

$0

$0

$0

$362,371

$18,084,976

FY 1987

$22,617,624

$25,931,680

$0

$18,522,629

$0

$2,568,998

$0

$0

$50,988,845

$7,044,825

$0

$3,941,936

$25,750,301

FY 1988

$23,948,600

$31,357,632

$0

$19,598,520

$0

$5,703,832

$0

$0

$16,157,649

$12,441,672

$0

$4,614,755

$73,144,809

FY 1989

$25,428,632

$37,420,711

$0

$20,789,215

$0

$8,802,914

$0

$0

$32,926,324

$15,458,710

$0

$5,212,073

$111,989,174

FY 1990

$37,556,561

$44,369,915

$0

$22,184,958

$0

$13,098,835

$0

$0

$50,171,919

$19,835,965

$0

$7,186,851

$152,004,708

FY 1991

$46,563,787

$47,277,743

$0

$23,638,871

$0

$15,801,047

$0

$0

$82,697,189

$28,683,081

$0

$8,258,029

$165,647,857

FY 1992

$56,395,797

$50,392,512

$0

$25,196,592

$0

$17,314,372

$0

$0

$74,307,953

$33,829,694

$0

$8,862,560

$197,946,923

FY 1993

$65,154,653

$54,029,406

$0

$27,014,703

$0

$17,181,190

$0

$0

$101,627,864

$40,700,513

$0

$10,067,359

$208,931,140

FY 1994

$80,128,944

$56,912,083

$0

$28,456,041

$0

$16,467,438

$0

$0

$108,284,693

$45,712,060

$0

$11,668,828

$225,230,065

FY 1995

$89,006,331

$59,849,850

$0

$29,924,925

$0

$16,841,673

$0

$0

$122,054,551

$50,782,093

$0

$12,219,847

$235,796,353

FY 1996

$82,622,236

$63,634,087

$0

$31,817,043

$0

$16,818,747

$0

$0

$135,982,304

$57,074,921

$0

$13,593,578

$224,037,663

FY 1997

$87,657,784

$67,616,395

$0

$33,808,197

$0

$16,202,440

$0

$0

$148,823,489

$62,530,982

$0

$14,097,454

$203,870,554

FY 1998

$91,390,173

$72,210,190

$0

$36,105,095

$0

$15,260,517

$0

$0

$156,537,913

$76,256,158

$0

$14,616,678

$171,425,780

FY 1999

$96,474,107

$76,488,424

$0

$38,244,213

$0

$9,762,741

$0

$0

$184,398,533

$93,459,890

$0

$14,905,196

$99,631,646

FY 2000

$120,227,960

$85,505,637

$0

$42,738,069

$0

$6,923,485

$0

$0

$203,029,971

$110,903,247

$0

$16,837,127

$24,256,451

FY 2001

$131,213,445

$90,118,787

$76,281,781

$45,059,394

$0

$5,824,134

$0

$0

$250,691,898

$139,774,848

$0

$18,237,767

($35,950,521)

FY 2002

$143,797,748

$94,792,026

$285,515,036

$47,378,092

$0

$7,140,560

$0

$0

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$163,979,754

$0

$19,017,292

$71,945,978

FY 2003

$162,954,010

$98,340,798

$124,661,063

$49,170,399

$0

$3,394,956

$0

$0

$368,462,963

$203,281,400

$0

$21,690,329

($82,967,487)

FY 2004

$248,552,679

$198,594,194

$298,197,463

$99,297,097

$79,457,387

$4,840,982

$0

$0

$366,840,457

$214,514,500

$0

$26,332,200

$238,285,158

FY 2005

$322,780,191

$202,397,566

$64,172,167

$101,198,783

$80,914,228

$11,300,868

$0

$0

$431,036,095

$229,522,988

$0

$33,333,010

$327,156,868

FY 2006

$326,844,982

$215,666,940

$0

$140,183,511

$118,607,527

$21,435,792

$34,611,607

$0

$427,553,404

$259,532,887

$0

$34,434,969

$462,985,967

FY 2007

$323,957,945

$238,190,720

$0

$154,823,968

$136,008,512

$32,671,539

$52,329,617

$0

$437,519,747

$304,773,401

$0

$35,878,194

$622,796,927

FY 2008

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$254,722,174

$0

$165,569,413

$141,672,630

$29,252,347

$59,486,239

$0

$498,767,038

$334,742,500

$0

$39,656,301

$728,839,324

FY 2009

$329,723,191

$267,471,299

$0

$173,856,344

$149,562,613

$17,482,143

$61,530,735

$0

$531,239,020

$353,893,845

$0

$43,184,393

$800,148,391

FY 2010

$332,481,933

$279,250,547

$0

$181,512,856

$155,918,241

$11,679,229

$70,795,686

$0

$575,539,788

$395,817,017

$0

$45,465,776

$814,964,302

FY 2011

$345,164,271

$282,782,431

$0

$183,808,580

$158,724,010

$8,168,640

$66,258,008

$70,629,797

$608,461,321

$384,017,059

$0

$47,151,354

$890,870,304

FY 2012

$363,348,030

$271,925,242

$0

$176,751,407

$154,607,926

$5,189,934

$71,575,942

($2,941,996)

$687,987,585

$454,143,825

$0

$48,181,723

$741,013,656

FY 2013

$355,685,504

$139,213,557

$102,363,704

$180,824,522

$160,952,396

$3,041,001

$98,628,841

$0

$686,321,003

$496,229,923

$1,075,388

$47,048,587

$551,048,281

FY 2014

$363,631,292

$290,775,235

$36,058,148

$189,003,903

$169,847,447

$2,061,745

$135,536,021

$0

$663,776,623

$539,842,962

$27,507,107

$48,894,894

$457,940,487

FY 2015

$369,066,459

$304,917,343

$768,100,754

$198,196,273

$179,157,485

$1,495,680

$200,321,166

$0

$746,668,738

$649,457,501

$59,000,080

$51,150,088

$972,919,240

FY 2016

$374,736,269

$320,895,370

$0

$208,581,991

$189,111,901

$5,421,446

$198,315,301

$0

$789,756,266

$716,536,786

$69,228,872

$52,973,441

$641,486,153

FY 2017

$382,043,720

$332,126,708

$15,651,511

$215,882,360

$195,466,131

$2,375,951

$201,039,074

$0

$782,945,633

$840,233,909

$61,268,758

$55,499,693

$246,123,616

FY 2018

$386,093,161

$343,751,143

$0

$223,438,243

$201,859,570

$614,628

$244,462,926

$0

$838,323,230

$988,668,373

$76,476,021

$56,499,464

($313,623,802)

FY 2019

$391,108,832

$350,626,166

$0

$227,907,008

$205,640,832

$0

$278,157,317

$0

$879,166,752

$1,149,628,078

$110,119,252

$57,504,295

($1,056,602,025)

FY 2020

$395,518,526

$357,638,689

$0

$232,465,148

$209,497,720

$0

$314,666,502

$0

$922,691,949

$1,324,638,018

$126,671,649

$58,100,301

($1,978,917,357)

FY 2021

$397,124,990

$364,791,463

$0

$237,114,451

$213,431,746

$0

$353,949,567

$0

$965,394,308

$1,509,202,007

$145,265,324

$59,127,448

($3,091,494,227)

4


**Total Participants:** 484,000
PPOs: 428,000; HMOs: 56,000

**Key Statistics**
- **Average Age:** 34.6 years old
- **Gender:** 64% Female
- **Percent Under Age 65:** 98%
- **Benefit Election Tier:** 71% elect Employee Only
  - 29% elect dependent coverage
- **Employees:** 296,000
- **Dependents:** 188,000
- **Geographic Area:** 54% Rural
- **Average Member Salary:** $46,343*

*Source: TRS CAFR, average member salary in 2016*
Cost Drivers

Overall Cost Drivers
- Increase in medical costs
- Increase in prescription drug costs
- Maintaining access and choice in managing providers
- Advances in technology for medical testing/equipment
- Development of new specialty and biogenetic drugs
- Federal and state legislation

TRS-Care Cost Drivers
- Increased utilization due to aging population
- Changes in the number of retirees in the group, particularly Non-Medicare
- Changes in Medicare programs
- Medicare primary benefits for members enrolled in the self-funded plans
- CMS reimbursements for fully-insured Medicare Advantage and Medicare Part D plans

TRS-ActiveCare Cost Drivers
- Increase in the number of participating entities
- Potential adverse selection due to the availability of public exchanges
Cost-Curve Factors

**Consumer Price Index (CPI) for healthcare – 3.4%**

health care cost inflation – change in cost/unit

**TRS-Care and ActiveCare health care cost trends**

7% medical/12% pharmacy

function of CPI and utilization trends – cost/unit and # units consumed

**TRS-Care aggregate cost growth**

6% medical/18% pharmacy

function of CPI, utilization, participation growth, plan design changes, plan migration

**TRS-ActiveCare aggregate cost growth**

function of CPI, utilization, participation growth, plan design changes, plan migration

varies dramatically year to year as a result of more significant year to year changes
Cost Containment

Health care cost = cost/unit * units consumed

Cost/unit strategies
- Contracting – leverage purchasing power of large companies in the market, e.g., large health insurance carrier with network discounts, pharmacy benefit managers with significant rebates

Utilization strategies
- Provider strategies – prior authorization and utilization management
- Participant strategies – discounts for desired behavior, e.g., lower co-pay for urgent care than ER, education, disease management, generic drugs, preventive screenings

Value-based contracts
- Aim to combine cost/unit and utilization strategies
- Shifting risk and incentive to integrated provider models to better manage outcomes and reduce costs
$7.6 B – cost without any management programs
  $2.4 B – medical and pharmacy cost avoided through Medicare Advantage/Part D strategies, compound drug initiatives, utilization management
  $1.3 B – fraud and waste monitoring, e.g., ineligible claims
  $2.3 B – provider discounts, member cost sharing
  $340 M – rebates, subsidies, pricing guarantees

$1.4 B – estimated costs after strategies

$6.2 B – estimated savings to TRS-Care fund resulting from cost containment strategies
$6.3 B – cost without any management programs
  $197 M – medical and pharmacy cost avoided through utilization management, compound drug initiatives, clinical management
  $1.2 B – fraud and waste monitoring, e.g., ineligible claims
  $3.2 B – provider discounts, member cost sharing
  $95 M – rebates, subsidies, pricing guarantees

$1.6 B – estimated costs after strategies

$4.7 B – estimated savings to TRS-ActiveCare fund resulting from cost containment strategies
# Comparison of value-based care models

## Reimbursement Models

<table>
<thead>
<tr>
<th>Pay-for-Performance (P4P)</th>
<th>Patient Centered Medical Home (PCMH)</th>
<th>Bundled Payment</th>
<th>Accountable Care Organization (ACO)</th>
<th>ACO Product</th>
<th>Joint Venture</th>
</tr>
</thead>
<tbody>
<tr>
<td>A first step into value-based contracting:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payment shifted from Fee-for-Service (FFS) to incentives for meeting quality goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Primary care model:</strong> 1. Team-based care 2. EHR 3. Enhance collaboration with Aetna care management programs</td>
<td><strong>Specialty care model:</strong> 1. Coordinate care 2. Eliminate waste 3. Align to evidence-based best practices across practitioners and sites, and over a period of time</td>
<td><strong>Population health model manages all care for attributed members:</strong> 1. Team-based care 2. EHR 3. Enhanced collaboration with care management programs</td>
<td><strong>Population health model with participation in a health plan:</strong> 1. Shared savings and risk for managing medical costs, quality 2. Opportunity to attract new patients</td>
<td><strong>Payer-provider partnership to launch a health insurance company:</strong> 1. Share in earnings and risk 2. Employ increased capabilities and expertise</td>
<td></td>
</tr>
<tr>
<td><strong>Financial Opportunity</strong></td>
<td><strong>Shift portion of payment from FFS to incentives for improvement quality and efficiency improvements</strong></td>
<td><strong>Reduce episode costs, share savings and risk for reducing complications and waste, and improve quality</strong></td>
<td><strong>Shift portion of reimbursement from FFS to payments and incentives for quality and total cost of care improvements, with risk for poor performance</strong></td>
<td><strong>Share in health plan savings and risk, with best-in-market PMPM medical costs and quality measure improvements</strong></td>
<td><strong>Share of health plan earnings and risk</strong></td>
</tr>
<tr>
<td><strong>Provider Fit</strong></td>
<td>Primary Care, Cardiology, Orthopedics, OB-Gyn, multispecialty practices and hospitals</td>
<td>Primary care medical home practices</td>
<td>Orthopedics, Cardiology, Maternity, Multispecialty practices, Post-Acute providers, and Hospital systems</td>
<td>Health systems/ID, CINs</td>
<td>Health systems/IDS, CINs</td>
</tr>
</tbody>
</table>

Source: Aetna Inc.
Comparison of value-based care models

- Approximately 16,000 Providers represented in these VBC arrangements
- Nearly 40% of participants in value-based provider settings
- Accountable care organizations
  - Memorial Hermann Accountable Care Network
  - Baptist Health System & HealthTexas Medical Group
  - Baylor Scott & White Quality Alliance
  - Seton Health Alliance
# Pay-for-Performance (P4P)

## Provider Match
- Primary Care
- Cardiology
- Orthopedics
- OB-Gyn
- Multispecialty Practices
- Hospitals

## Collaboration Features
- **Portion of fee-for-service shifted to incentives**
  for improvement quality measures as a first step into VBC
- **Data sharing, scorecard, and quarterly meetings**
- **Payment dependent on improving performance**
or maintaining already high performance

## Measure Examples
Readmissions, Adverse Event Rates, Risk-Adjusted C-Sections, Patient Experience, Preventive Care & Screening, Chronic Disease Management, Generic Rx, Participating Provider Status

Source: Aetna Inc.
## Patient-Centered Medical Home (PCMH)

<table>
<thead>
<tr>
<th>Provider Match</th>
<th>Collaboration Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Primary Care Practices</td>
<td>Primary care model with attribution-based payments and incentives for quality and efficiency improvements</td>
</tr>
<tr>
<td>• &gt;1500 but &lt;5000 attributed members</td>
<td>Data and performance reports (quarterly, monthly, daily) and quarterly meetings</td>
</tr>
<tr>
<td>Quality Measure Examples</td>
<td>Providers coordinate care with Aetna care management programs</td>
</tr>
<tr>
<td>Preventive Care &amp; Screening, Chronic Disease Management</td>
<td>Efficiency Measure Examples</td>
</tr>
<tr>
<td>Efficiency Measure Examples</td>
<td>Readmissions, Potentially Avoidable ED Visits, Bed Days, Participating Provider Status, Generic Rx</td>
</tr>
</tbody>
</table>

Source: Aetna Inc.
# Bundled Payment

## Provider Match
- Orthopedics
- Cardiology
- Ob-Gyn
- Multispecialty Practices
- Post-acute Providers
- Hospitals

## Collaboration Features
- **Episode-based care model** with opportunity for provider to retain savings generated through coordination of care, reducing waste, avoiding complications, and deploying evidence-based practices across practitioners and sites.
- **Data reports and quarterly meetings**
- **Episode payment** covers defined period of time, complications and adverse events, providers across the continuum including facilities.
- **Opportunity** for additional incentive for measured quality improvements

### Bundle Examples
Hip Replacement, Knee Replacement, Shoulders, Spine Surgery, Maternity Care, PCI, CABG

Source: Aetna Inc.
# Accountable Care Organization Attribution (ACOA)

## Provider Match
- Integrated delivery systems (IDS),
- Clinically integrated networks (CINs)
- Large primary care systems
- >5000 attributed members

## Collaboration Features
- **Population health model** where portion of reimbursement is shifted from fee-for-service to ACP payments and incentives tied to quality and cost of care improvements, with risk for poor performance
- **Data, reports** (quarterly, monthly, daily) and quarterly meetings
- **Providers use** team-based care, EHR, and enhanced collaboration with Aetna care management programs

## Quality Measure Examples
- Preventive Care & Screening, Chronic Disease Management

Source: Aetna Inc.
### Provider Match
- Health systems, integrated delivery systems (IDS), hospitals and large physician practices
- Willingness to provide best-in-class premium pricing

### Collaboration Features
- **Grow membership** with best-in-market PMPM medical costs and quality measure improvements
- **Population health model** where provider shares in product savings and risk. Payment levels are adjusted for quality performance.
- **Data, reports (quarterly, monthly, daily)** and quarterly meetings. Clinical transformation and coaching.
- **Providers use** team-based care, EHR, and enhanced collaboration with Aetna care management programs

### Quality Measure Examples
- Preventive Care & Screening, Chronic Disease Management

Source: Aetna Inc.
Joint Venture (JV) Health Insurance Company

A payer-provider partnership

Provider Match

- Health systems, integrated delivery systems (IDS) and hospitals
- Clinically integrated networks (CINs)
- Willingness to form a new company

Incentive

- Rewards providers by putting them in the business of health insurance

Collaboration Features

Jointly owned health insurance company with economics and governance aligned by a payer-provider partnership

Share capabilities, membership growth, and earnings and risk in a model that uses the core competencies of each party to create financial opportunity

Breakthrough consumer experience by creating one health care point-of-contact, dedicated to integrated, efficient processes

Source: Aetna Inc.
Teachers Retirement System of Texas Housing Overview & Strategies

February 24th 2017

Presented by:
John Burns | CEO
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Who Is John Burns Real Estate Consulting?

Diverse Research subscribers

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- Home Builders, 29%
- Building Products / Services, 19%
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- Developers, 8%
- Banks/Other, 7%
- Single-Family Rental, 4%

As of January 2017

Quick Stats

- Companies Subscribing to Our Research: 190
- Annual Consulting Assignments: 700+
- Linkedin Followers: 500,000+
- Newsletter Subscribers: 30,000+

Regularly Quoted In:

- WSJ
- The Washington Post
- Bloomberg Businessweek
- USA Today
- Builder
- CNBC
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Short-Term Outlook: Goldilocks Market - not too Hot, not too Cold

JBREC MARKET HOTNESS INDEX FOR 50 LARGEST MARKETS
Medium-Term Outlook: **Low Risk**

JBREC HOUSING CYCLE RISK INDEX™ FOR 50 LARGEST MARKETS
Long-Term Outlook: 14% Overpriced

JBREC INTRINSIC HOME VALUE INDEX™ FOR 50 LARGEST MARKETS

Legend:
- Undervalued
- Fairly valued
- Overvalued

Cities and Percentages:
- Seattle 21%
- San Francisco 27%
- San Jose 23%
- Sacramento 19%
- Salt Lake City 18%
- Los Angeles 30%
- Las Vegas 14%
- Denver 25%
- Phoenix 17%
- Riv-San Bern 25%
- Orange County (MDiv) 23%
- San Diego 19%
- Austin 28%
- Houston 28%
- Dallas 28%
- San Antonio 25%
- Raleigh-Durham 6%
- Charlotte 6%
- Washington, DC (MSA) 8%
- Chicago -4%
- Minneapolis 7%
- Charlotte 6%
- Jacksonville 11%
- Orlando 21%
- West Palm Beach 29%
- Miami 37%
Our Housing Cycle Conclusions

Phase 1
Cycle Bottom / Early Recovery

Phase 2
Expansion

Phase 3
Exuberance

Phase 4
Contraction / Early Downturn

Phase 5
Full Downturn / Recession

Cities:
- Houston
- Orange County
- Los Angeles
- Riverside
- San Bern
- Chicago
- Dallas
- Austin
- Orlando
- Las Vegas
- Wash. DC
- Tampa
- Nashville
- Phoenix
- Atlanta
- Charlotte
- Jacksonville
- San Diego
- Kansas City
- Denver
- Salt Lake City
- Minneapolis
- San Jose
- Bay Area
- Portland
- Seattle
- Manhattan
- Boston urban
- Miami (SF)
- Philadelphia
- Suburbs
- Phoenix
- Chicago
- Las Vegas
- Riverside-San Bern.
BIG SHIFTS AHEAD
DEMographic CLARITY FOR BUSINESSES
JOHN BURNS
CHRIS PORTER

Demographic Clarity for Business
Demographics drive the economy with household formation and home buying.
New Framework for Demographic Clarity

1. Group the Generations into Decade Born

2. Filter through the 4-5-6 Rule

6 2025
347 million (+8%)
Biggest Problem: Generations

Peak Birth Years

1930 - 1945: SILENT GENERATION
1945 - 1964: BABY BOOMERS
1964 - 1983: GENERATION X
1983 - 2002: MILLENNIALS
What do these two have in common?

32 year old
Working Father

16 year old
High School Junior

1984 | MILLENNIALS | 2002
Solution: Define Generations by Decade Born

2016 US Population

- **1930s Savers**: Age 78-87
- **1940s Achievers**: Age 68-77
- **1950s Innovators**: Age 58-67
- **14 M**
- **27 M**
- **40 M**
Surging Retirement

65+ POPULATION BY DECADE OF BIRTH

Source: John Burns Real Estate Consulting, LLC calculations of US Census Bureau Population Estimates and 2014 National Projections
1950s

INNOVATORS

40 Million Aged 57-66
Step 1: Define Generations by Decade Born

2016 US POPULATION

1930s Savers Age 78-87
1940s Achievers Age 68-77
1950s Innovators Age 58-67
1960s Equalers Age 48-57
1970s Makers Age 38-47
1980s Changers Age 28-37
1990s Testers Age 18-27
2000s Innovators Age 0-17

Step 1: Define Generations by Decade Born

2016 US POPULATION


14 M 27 M 43 M 40 M

1960s Equalers Age 48-57

Step 1: Define Generations by Decade Born

2016 US POPULATION

1930s Savers Age 78-87
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1990s Testers Age 18-27
2000s Innovators Age 0-17

Step 1: Define Generations by Decade Born

2016 US POPULATION


14 M 27 M 43 M 40 M

1960s Equalers Age 48-57
1960s

EQUALERS

43 Million Aged 47-56
Expect more Surban™ Homes

Santana Row, San Jose

Flats at Bethesda Avenue

Viridian in Arlington
Starting at $229,000
Solution: Define Generations by Decade Born

2016 US POPULATION

1930s Savers  Age 78-87
1940s Achievers  Age 68-77
1950s Innovators  Age 58-67
1960s Equalers  Age 48-57
1970s Balancers  Age 38-47

Fewer Working
FEMALE LABOR FORCE PARTICIPATION RATE, AGES 20–64

% OF 20-64 YEAR-OLD WOMEN WHO WORK

37% 42% 50% 61% 69% 73% 70%

Source: John Burns Real Estate Consulting, LLC calculations of Bureau of Labor Statistics data; color-coded based on the year a generation turns 20
More Stay-at-Home Moms
SHARE OF MOMS WHO STAY AT HOME FULL TIME

- 1940s Achievers
- 1950s Innovators
- 1960s Equalers
- 1970s Balancers
- 1980s Sharers
Homeownership in Late 30s

HOMEOWNERSHIP RATE FOR 35–39 YEAR-OLDS

YEAR


HOMEOWNERSHIP RATE

1940s Achievers
1950s Innovators
1960s Equalers
1970s Balancers

65%
61%
63%
65%
52%
Almost 12% of America rents a single-family home

RENTING A HOME GROWING IN POPULARITY

FIGURE 8.10 Single-Family Rental Homes as a Percent of Total Housing Units

Source: John Burns Real Estate Consulting, LLC based on US Census Bureau data from American Community Survey; years are based on Q3
Solution: Define Generations by Decade Born

2016 US Population

1930s Savers
Age 78-87

1940s Achievers
Age 68-77

1950s Innovators
Age 58-67

1960s Equalers
Age 48-57

1970s Balancers
Age 38-47

1980s Sharers
Age 28-37

1990-99
2000-10
Declining Economic Growth

AVERAGE GDP GROWTH PER PERSON—PRIME WORKING YEARS (25-54)

1930s Savers: 2.4%
1940s Achievers: 2.1%
1950s Innovators: 1.9%
1960s Equalers*: 1.5%
1970s Balancers*: 1.1%
1980s Sharers*: 1.0%
Solution: Define Generations by Decade Born

2016 US POPULATION


1930s Savers Age 78-87
1940s Achievers Age 68-77
1950s Innovators Age 58-67
1960s Equalers Age 48-57
1970s Balancers Age 38-47
1980s Sharers Age 28-37
1990s Connectors Age 18-27

14 M 27 M 40 M 43 M 41 M 44 M 44 M
Urban and suburban will capture a high share of growth

**SHARE OF HOUSEHOLD GROWTH BY DECADE**

- **Today’s Urban**
- **Today’s Suburbs**
- **Today’s Rural**

![Graph showing the share of household growth by decade](image)

**Source:** John Burns Real Estate Consulting, LLC based on US Census Bureau data
Solution: Define Generations by Decade Born

2016 US POPULATION

- **1930s Savers** Age 78-87
- **1940s Achievers** Age 68-77
- **1950s Innovators** Age 58-67
- **1960s Equalers** Age 48-57
- **1970s Balancers** Age 38-47
- **1980s Sharers** Age 28-37
- **1990s Connectors** Age 18-27
- **2000s Globals** Age 8-17

Population counts:
- 1930–39: 14 M
- 1940–49: 27 M
- 1950–59: 40 M
- 1960–69: 43 M
- 1970–79: 41 M
- 1980–89: 44 M
- 1990–99: 44 M
- 2000–10: 41 M
Filter: The 4-5-6 Rule

**The 4 Big Influencers**

1. Government Policies
2. Economic Cycles
3. Technology Advances
4. Societal Shifts

**During 5 Main Life Stages**

1. Childhood
2. Early Career
3. Family Formation
4. Late Career
5. Retirement

**Help Answer the 6 Key Consumer Questions**

1. Who?
2. What?
3. When?
4. Where?
5. Why?
6. How?
Technologies Shift Demographic Behavior

1960s Equalers

1990s Connectors
Each generation from 1950 on should form 23-24 million households.

**ESTIMATED 2016 HOUSEHOLDS BY DECADE BORN**

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>NUMBER OF HOUSEHOLDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre 1930s</td>
<td>2.9M</td>
</tr>
<tr>
<td>1930s Savers</td>
<td>8.0M</td>
</tr>
<tr>
<td>1940s Achievers</td>
<td>15.7M</td>
</tr>
<tr>
<td>1950s Innovators</td>
<td>22.9M</td>
</tr>
<tr>
<td>1960s Equalers</td>
<td>23.5M</td>
</tr>
<tr>
<td>1970s Balancers</td>
<td>21.0M</td>
</tr>
<tr>
<td>1980s Sharers</td>
<td>19.5M</td>
</tr>
<tr>
<td>1990s Connectors</td>
<td>7.4M</td>
</tr>
</tbody>
</table>

Sources: John Burns Real Estate Consulting, LLC based on US Census Bureau data
12.5 Million Future Household Formations

NET CHANGE IN HOUSEHOLDS BY DECADE BORN, 2016–2025 (MILLIONS)

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>NET CHANGE IN HOUSEHOLDS (MILLIONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre 1930s</td>
<td>-3.1</td>
</tr>
<tr>
<td>1930s Savers</td>
<td>-4.9</td>
</tr>
<tr>
<td>1940s Achievers</td>
<td>-3.8</td>
</tr>
<tr>
<td>1950s Innovators</td>
<td>-1.4</td>
</tr>
<tr>
<td>1960s Equalers</td>
<td>-0.1</td>
</tr>
<tr>
<td>1970s Balancers</td>
<td>1.6</td>
</tr>
<tr>
<td>1980s Sharers</td>
<td>4.3</td>
</tr>
<tr>
<td>1990s Connectors</td>
<td>14.0</td>
</tr>
<tr>
<td>2000s Globals</td>
<td>5.9</td>
</tr>
</tbody>
</table>

13.3 million losses

25.8 million gains
Big Shift in Household Composition

HOUSEHOLD FORMATION BY AGE GROUP, 2016–2025

NET CHANGE IN HOUSEHOLDS

AGE RANGE

-2,000,000

-0.2 M

2,000,000

0.01 M

4,000,000

0.8 M

6,000,000

2.5 M

8,000,000

4.3 M

10,000,000

5.4 M

12,000,000

0.5 M

Under Age 45

Age 45–64

Age 65+

Big Shift in Household Composition

HOUSEHOLD FORMATION BY AGE GROUP, 2016–2025

NET CHANGE IN HOUSEHOLDS

AGE RANGE

-2,000,000

-0.2 M

2,000,000

0.01 M

4,000,000

0.8 M

6,000,000

2.5 M

8,000,000

4.3 M

10,000,000

5.4 M

12,000,000

0.5 M

Under Age 45

Age 45–64

Age 65+
2025: 12.5M Households Added

PROJECTED HOUSEHOLD GROWTH BY REGION (MILLIONS), 2016–2025

<table>
<thead>
<tr>
<th>REGION</th>
<th>Owners</th>
<th>Renters</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeast</td>
<td>1.2</td>
<td></td>
<td>1.8</td>
</tr>
<tr>
<td>Texas</td>
<td>0.8</td>
<td>1.1</td>
<td>1.9</td>
</tr>
<tr>
<td>Florida</td>
<td>0.6</td>
<td>0.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Southwest</td>
<td>0.6</td>
<td>0.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Northeast</td>
<td>0.5</td>
<td>0.6</td>
<td>1.1</td>
</tr>
<tr>
<td>California</td>
<td>0.5</td>
<td>0.6</td>
<td>1.1</td>
</tr>
<tr>
<td>Midwest</td>
<td>0.4</td>
<td>0.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Central</td>
<td>0.4</td>
<td>0.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Northwest</td>
<td>0.3</td>
<td>0.5</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Those born before 1970 own 75% of all owned households

NUMBER OF HOMEOWNERS IN 2015 (MILLIONS)

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>NUMBER OF HOMEOWNERS (MILLIONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-1930s</td>
<td>2.4</td>
</tr>
<tr>
<td>1930s Savers</td>
<td>6.6</td>
</tr>
<tr>
<td>1940s Achievers</td>
<td>12.7</td>
</tr>
<tr>
<td>1950s Innovators</td>
<td>17.3</td>
</tr>
<tr>
<td>1960s Equalers</td>
<td>16.2</td>
</tr>
<tr>
<td>1970s Balancers</td>
<td>11.8</td>
</tr>
<tr>
<td>1980s Sharers</td>
<td>7.4</td>
</tr>
<tr>
<td>1990s Connectors</td>
<td>0.9</td>
</tr>
</tbody>
</table>

Source: John Burns Real Estate Consulting, LLC based on US Census Bureau
Homeownership for those under 65 is far below their predecessors at the same age.

HOMEOWNERSHIP RATE IN 2015 BY AGE

<table>
<thead>
<tr>
<th>Decade</th>
<th>Age</th>
<th>Homeownership Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990s Connectors (age 18)</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>1980s Sharers (age 28)</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>1970s Balancers (age 38)</td>
<td>54%</td>
<td></td>
</tr>
<tr>
<td>1960s Equalers (age 48)</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>1950s Innovators (age 58)</td>
<td>74%</td>
<td></td>
</tr>
<tr>
<td>1940s Achievers (age 68)</td>
<td>80%</td>
<td></td>
</tr>
</tbody>
</table>

- 3% above 1980s Sharers in 2000. Many HH not yet formed.
- 8% below 1970s Balancers in 2000
- 11% below 1960s Equalers in 2000
- 7% below 1950s Innovators in 2000
- 6% below 1940s Achievers in 2000
- 1% below 1930s Savers in 2000

Sources: John Burns Real Estate Consulting
Homeownership will rise as people age, but remain 7-11% below that of prior generations at the same age.

**ASSUMED HOMEOWNERSHIP RATE IN 2025 BY AGE**

- **2000s Globals** (age 18): 10%
- **1990s Connectors** (age 28): 27%
- **1980s Sharers** (age 38): 52%
- **1970s Balancers** (age 48): 63%
- **1960s Equalers** (age 58): 70%
- **1950s Innovators** (age 68): 74%

10% more than in 2015, and 5% less than **1980s Sharers** in 2015

20% more than in 2015

9% more than in 2015

Same as in 2015

Source: John Burns Real Estate Consulting, LLC
Homeowner Forecast 2025

HOMEOWNER GROWTH BY GENERATION (MILLIONS), 2016–2025

- Pre 1930s: -2.2
- 1930s Savers: -4.1
- 1940s Achievers: -3.2
- 1950s Innovators: -1.1
- 1960s Equalers: 0.6
- 1970s Balancers: 2.8
- 1980s Sharers: 5.4
- 1990s Connectors: 6.2
- 2000 Globals: 0.9

HOMEOWNER GROWTH (MILLIONS)

-10.6 M to 15.9 M
Homeownership should reach 60.8% in 2025—the lowest since the 1950s

Source: John Burns Real Estate Consulting, LLC based on US Census Bureau data
7 Tremendous housing growth opportunities through 2025

- +3.3 million Young (<45) Households
- +10.2 million Senior Households
- +8 million Immigrants
- +5.3 million more HOMEOWNERS
- +7.2 million more RENTERS
- 62% of growth in the SOUTH

“Surban” Lifestyle
ICMI Contact Center Assessment Panel Discussion
February 24, 2017

Janet Bray, Chief Human Resources Officer
Barbie Pearson, Chief Benefits Officer
Chris Cutler, Chief Information Officer
Katrina Daniel, Chief Health Care Officer

Wendy Fowler and Laura Grimes
ICMI Senior Certified Associates
The TRS Perspective: Overview

- TRS Staff Overview
  - Challenges
  - Implementation Progress and Timeline
- International Customer Management Institute (ICMI)
  - Assessment Methodology
  - Assessment Results
  - Recommendations
## TRS Current Challenges

<table>
<thead>
<tr>
<th>Benefit Services</th>
<th>HIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased membership</td>
<td>• Service levels</td>
</tr>
<tr>
<td>• Decreasing service levels</td>
<td>• Increased call volume due to benefit changes and pending legislative changes</td>
</tr>
<tr>
<td>• Increased call handling time due to members asking more complex questions</td>
<td>• Increased call handling time due to members asking more complex questions</td>
</tr>
<tr>
<td>• Limited schedule for office visits</td>
<td>• More frequent changes to benefits</td>
</tr>
<tr>
<td>• Demand for office and phone counseling outpaces available resources</td>
<td>• Increased demand for more complex analytics</td>
</tr>
<tr>
<td>• Insufficient forecasting tools</td>
<td>• Additional communication avenues increase workload</td>
</tr>
<tr>
<td>• Additional communication avenues increase workload</td>
<td></td>
</tr>
<tr>
<td>• Increased call volume due to HIB support</td>
<td></td>
</tr>
</tbody>
</table>

### Organizational Excellence

<table>
<thead>
<tr>
<th>IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Staff is currently committed supporting ongoing operations, agency-wide projects, and TEAM</td>
</tr>
<tr>
<td>• Difficulties in supporting outdated technologies</td>
</tr>
<tr>
<td>• Inability to support new initiatives due to competing project demands</td>
</tr>
</tbody>
</table>

- Increased demand for more trainings held more frequently
- Increased demand for quality assurance reviews and coaching
- Competing projects (e.g. TEAM, agency wide-project support)
The ICMI Perspective: Project Background

- **TRS engaged ICMI to:**
  - Assess the current operations and structure
  - Develop a strategy to enhance current operations and implement best practices
  - Create recommendations to outline business case and action steps

- **Provide observations and analysis of:**
  - Current contact center (TCC and HIB) processes, procedures and materials
  - Customer service in the Benefit Reporting area
  - Overall organization, processes and procedures
  - Resource allocation and structure
  - Training provided to contact center and other Benefit Services staff
  - Shared and distinct division responsibilities
  - Metrics
  - Current technology (infrastructure, software, phone system) to support contact center operations
  - Vendor partnerships
## Methodology of ICMI Assessment

<table>
<thead>
<tr>
<th>On-Site Activities</th>
<th># Sessions</th>
<th># of Attendees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Tours</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Side by side Observations</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>(67 calls)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training Class Observations</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>1:1 Interviews/Sessions</td>
<td>13</td>
<td>80</td>
</tr>
<tr>
<td>Focus Groups – Managers</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Focus Groups – Supervisors</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Focus Groups – Counselors</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>32</td>
<td>115</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Off-Site Activities</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TRS Documents Reviewed / Analyzed</td>
<td></td>
<td>115</td>
</tr>
<tr>
<td>External Research: Interviews,</td>
<td></td>
<td>&gt; 50</td>
</tr>
<tr>
<td>Documents &amp; Websites</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Executive Summary

- **TRS is facing:**
  - Significant growth in membership
  - Increased complexities of managing retirement and health insurance benefit related information
  - Limited technology to effectively serve members
  - Challenges with workforce management
  - Increased frustration from members which leads to counselor burn out

- **Benefit Services and Health Insurance Benefits member services:**
  - Struggle to stay abreast of changes due to increasing complexities of managing pension and health insurance benefits-related information
  - Unable to implement operational best practices, technology, and employee development due to agency resource constraints
  - Not adequately staffed and unable to meet current service-level expectations
The Good Stuff

**Planning**
The strategic plan is a living document. Leaders are willing and proactive to update.

**Engagement**
Associates serve. Members are called back. Strong collaboration with TRS exists.

**Ready!**
Leadership promotes a change friendly environment that fosters eagerness for change. The agency is ready!

**Future Friendly**

**Actions Speak**
Commendable when members bake cakes or send flowers to show appreciation!

**Career Path**
100% of the counselors who responded to our question expressed a desire to advance.

**Pioneering**
Home-grown dashboards and tools provided for growth. The IT team is a band of rock stars!

**Member Satisfaction**

**Commitment**

**Resourcefulness**

**Annual Rate**
TRS retains counselors at a higher rate than the industry. Work/Life balance!

**Environment**

**6 Years**
TRS is a destination employer in Austin. People like working here!

**Retention**

**Top Workplace**

**OCM**
Effectively communicates and socializes upcoming changes. Associates are “in the know”
### Primary Recommendations

<table>
<thead>
<tr>
<th>1</th>
<th>Rigorously engage a proactive planning process and culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Realign the contact center and support structure to improve scalability, efficiency and communication</td>
</tr>
<tr>
<td>3</td>
<td>Enhance quality assurance and continuous improvement initiatives</td>
</tr>
<tr>
<td>4</td>
<td>Focus on right metrics, support with clear reporting and confident coaching efforts</td>
</tr>
<tr>
<td>5</td>
<td>Address technology and facility issues</td>
</tr>
<tr>
<td>Category</td>
<td>Areas Covered</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>Planning and Workforce Management</td>
<td>• Forecasting and planning</td>
</tr>
<tr>
<td></td>
<td>• Staffing and scheduling</td>
</tr>
<tr>
<td></td>
<td>• Real-time management</td>
</tr>
<tr>
<td></td>
<td>• Reporting</td>
</tr>
<tr>
<td>Organizational Effectiveness</td>
<td>• Talent Acquisition</td>
</tr>
<tr>
<td></td>
<td>• Onboarding</td>
</tr>
<tr>
<td></td>
<td>• Organizational alignment</td>
</tr>
<tr>
<td></td>
<td>• Compensation</td>
</tr>
<tr>
<td>Learning and Development</td>
<td>• Career paths</td>
</tr>
<tr>
<td></td>
<td>• Training</td>
</tr>
<tr>
<td></td>
<td>• Education and development</td>
</tr>
<tr>
<td></td>
<td>• Quality Assurance</td>
</tr>
<tr>
<td></td>
<td>• Process improvement</td>
</tr>
<tr>
<td>Performance Management</td>
<td>• Metrics</td>
</tr>
<tr>
<td></td>
<td>• Reporting</td>
</tr>
<tr>
<td></td>
<td>• Coaching</td>
</tr>
<tr>
<td></td>
<td>• Recognition</td>
</tr>
<tr>
<td>Technology and Environment</td>
<td>• Analysis and planning</td>
</tr>
<tr>
<td></td>
<td>• Project management</td>
</tr>
<tr>
<td></td>
<td>• Development</td>
</tr>
<tr>
<td></td>
<td>• Test, implement, support</td>
</tr>
</tbody>
</table>
### High Level Recommendations

<table>
<thead>
<tr>
<th>TOP 5</th>
<th>High Level Overview</th>
</tr>
</thead>
</table>

**Recommendation #1:** Rigorously engage a proactive planning process and culture
- Completely and accurately forecast all workloads
- Develop long-term capacity plans (12 month minimum)
- Hire the staff needed
- Formalize proactive planning process to ensure all non-productive activities occur at the optimal time
- Adopt WFM Best Practices and formally re-launch WFM

**Recommendation #2:** Realign the contact center and support structure to improve scalability, efficiency and communication
- Hire the staff needed
- Conduct pre-hire assessments
- Enhance the current onboarding process
- Realign by function
- Centralize all shared service support functions
- Refocus supervisor duties
Benefit Counseling Reported Metrics

**Call Volume**

<table>
<thead>
<tr>
<th></th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calls received</td>
<td>513,065</td>
<td>501,593</td>
<td>550,147</td>
</tr>
<tr>
<td>Calls answered</td>
<td>500,668</td>
<td>486,572</td>
<td>506,362</td>
</tr>
</tbody>
</table>

**Call Processing Time**

<table>
<thead>
<tr>
<th></th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.23</td>
<td>5.31</td>
<td>6.77</td>
<td></td>
</tr>
</tbody>
</table>

**Service Level**

<table>
<thead>
<tr>
<th></th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>87.0%</td>
<td>84.0%</td>
<td>60.6%</td>
<td></td>
</tr>
</tbody>
</table>

**Benefit Services Counseling Positions**

- **Telephone Counseling**
  - FY 2014: 40
  - FY 2015: 42
  - FY 2016: 42

- **Office Visit Counseling**
  - FY 2014: 15
  - FY 2015: 15
  - FY 2016: 15
HIB Reported Metrics

**Calls Received**

- FY 2014: 104,390
- FY 2015: 90,517
- FY 2016: 105,604
- FY 2017*: 69,517

**Office Visits**

- FY 2014: 1,293
- FY 2015: 1,216
- FY 2016: 1,472
- FY 2017*: 605

**Correspondence (Fax, Email, and Mail)**

- FY 2014: 264,986
- FY 2015: 155,583
- FY 2016: 224,065
- FY 2017*: 84,074

**HIB Counselors**

- FY 2014: 14
- FY 2015: 13
- FY 2016: 15

*Note: FY 2017 data includes September – December 2016 data for calls, visits and correspondence received. Projected numbers are based on current workload compared to FY 2016 data.
How Benefit Changes Impact HIB Customer Service

- **Office Visits**
  - May-16: 7,553
  - Jun-16: 8,899
  - Jul-16: 8,934
  - Aug-16: 15,977
  - Sep-16: 17,960
  - Oct-16: 18,020
  - Nov-16: 17,793
  - Dec-16: 15,744

- **Calls**
  - May-16: 10,829
  - Jun-16: 10,410
  - Jul-16: 10,051
  - Aug-16: 19,313
  - Sep-16: 17,960
  - Oct-16: 18,020
  - Nov-16: 17,793
  - Dec-16: 15,744

- **Correspondence**
  - May-16: 121
  - Jun-16: 156
  - Jul-16: 183
  - Aug-16: 208
  - Sep-16: 154
  - Oct-16: 153
  - Nov-16: 138
  - Dec-16: 160

- **Total Correspondence and Calls**
  - May-16: 592
  - Jun-16: 1,182
  - Jul-16: 1,919
  - Aug-16: 4,952
  - Sep-16: 3,478
  - Oct-16: 3,098
  - Nov-16: 2,702
  - Dec-16: 3,703

**Total Office Visits and Correspondence & Calls**
- May-16: 8,166
- Jun-16: 11,630
- Jul-16: 20,836
- Aug-16: 41,276
- Sep-16: 35,102
- Oct-16: 30,908
- Nov-16: 28,334
- Dec-16: 39,447
How Benefit Changes Impact HIB Customer Service

Board Meeting - TRS and TRTA post announcement on websites

- TRS new article and video on health plan
- Humana letter sent
- Kelsey Care letter

- Packets sent to new retirees and participants turning 65 re: Jan 1 changes
- Humana and ESI host seminars

- Aetna disenrollment letter sent
- Humana MA ID cards sent

- TRS sends Part D announcement
- ESI sends letter on convenience fee
- Humana sends enrollment information

- MA application added to TRS website
- Humana and ESI host webinar
- Kelsey Care letter sent
# Implementation Goals

## Calendar Year 2016 and 2017*

- Begin routing HIB calls related to health insurance benefit enrollment and benefit coverage to benefit counseling. HIB will handle escalated calls (e.g., claims disputes and enrollment disputes)
- Centralize all shared service support functions outside of HIB and Benefit Services
- Ensure supervisors are responding to escalated calls
- Require supervisors to spend a minimum number of hours per month taking calls
- Require supervisors to walk the floor regularly to monitor and coach staff

## Calendar Year 2018*

- Expand in-person counseling and enrollment processing opportunities for HIB
- Fully maximize volume of contact center calls taken by HIB vendors
- Ensure that skill-sets required to accurately forecast exists within TRS
- Enhance skills of on-the-job training coaches

*Achievement of goals is based on increased staffing levels and additional resources in HIB, Benefit Services, Organizational Excellence (HR), and IT. The TEAM Program could also impact timelines and available resources.
**Implementation Goals**

**Calendar Year 2017***
- Enhance employee engagement (e.g., stay interviews, focus groups, check-ins, etc.)
- Add temporary staff for HIB through external contract
  - Explore floating staff concept
- Create baseline skill-sets list for major positions within Benefit Services and HIB
- Explore options to create skill path, career path and development opportunities

**Calendar Year 2018***
- Identify positions across agency where there could be transferable skills
- Implement and communicate skill path, career path and development opportunities

*Achievement of goals is based on increased staffing levels and additional resources in HIB, Benefit Services, Organizational Excellence (HR), and IT. The TEAM Program could also impact timelines and available resources.*
## TOP 5

<table>
<thead>
<tr>
<th>Recommendation #3:</th>
<th>High Level Overview</th>
</tr>
</thead>
</table>
| Enhance quality assurance and continuous improvement initiatives | - Clarify and communicate skill path, career path and development opportunities  
- Provide ongoing development  
- Monitor all interactions and more often  
- Coach to the behavior, not the score  
- Identify opportunities to improve processes  
- Create a helpline for counselors to call when they have questions |
## Implementation Goals

### Calendar Year 2016 and 2017*

- Increase call review and scoring in HIB and BC
- Determine a consistent method for counselor delivery
- Identify areas to streamline quality assurance processes
- Create a helpline (SMEs) for counselors to call when they have program questions
- Review employee recognition program for both Benefits and HIB
- Develop a mandatory training curriculum for all levels of contact center employees and associated support staff

### Calendar Year 2018*

- Continue to increase call review and scoring in HIB and BC
- Create a streamlined online repository eliminating the need for paper reference documents
- Implement new rewards and recognition programs
- Require annual training of 15 hours at a minimum, applicable to the job function and succession of position

---

*Achievement of goals is based on increased staffing levels and additional resources in HIB, Benefit Services, Organizational Excellence (HR), and IT. The TEAM Program could also impact timelines and available resources.*
**Recommendation #4:** Focus on right metrics, support with clear reporting and confident coaching efforts

- Coordinate your customer access strategy
- Establish and enforce service-level agreements with third-party providers
- Measure all channels
- Enhance formal and informal communication channels
- Calibrate coaching with QA and supervisors
## Implementation Goals

### Calendar Year 2016 and 2017*

- Establish a consistent method of managing customer service metrics (e.g., calls, emails, chats, peak call volume times)

### Calendar Year 2018*

*Achievement of goals is based on increased staffing levels and additional resources in HIB, Benefit Services, Organizational Excellence (HR), and IT. The TEAM Program could also impact timelines and available resources.
**High Level Recommendations Summary**

<table>
<thead>
<tr>
<th>TOP 5</th>
<th>High Level Overview</th>
</tr>
</thead>
</table>
| **Recommendation #5:** Address technology and facility issues | - Invest in updated and new technologies  
- Prepare for remote work  
- Content provisioning for channels should ensure that members receive the same answer regardless of how they sought the information  
- Redesign space so that center operations are in a contiguous work space  
- Locate supervisors in the center, near their teams  
- Provide member meeting rooms in a less secured location |
## Implementation Goals

<table>
<thead>
<tr>
<th>Calendar Year 2017*</th>
<th>Calendar Year 2018*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigate and research latest leading technology solutions for enterprise call centers. This includes potential replacement technologies for our Integrated Voice Response (IVR), Automatic Call Distribution (ACD) quality monitoring, workforce management, data analytics and call routing systems</td>
<td>▪ Create a Request for Offer (RFO) to purchase and implement a new call center solution</td>
</tr>
<tr>
<td>▪ Identify and document call center requirements creating detailed level requirements and statement of work documents</td>
<td>▪ Start Phase I of technology implementation</td>
</tr>
<tr>
<td>▪ Continue to build out and improve the ease of use for web-based reference tools for call center staff</td>
<td></td>
</tr>
</tbody>
</table>

*Achievement of goals is based on increased staffing levels and additional resources in HIB, Benefit Services, Organizational Excellence (HR), and IT. The TEAM Program could also impact timelines and available resources.
### ICMI Recommended Staffing Level Plans

<table>
<thead>
<tr>
<th>Position</th>
<th>Service Level Objective</th>
<th>Current TRS Staff</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80% in 180 Seconds</td>
<td>80% in 60 Seconds</td>
<td></td>
</tr>
<tr>
<td>Counselors (Office and Telephone)</td>
<td>75</td>
<td>82</td>
<td>62.8*</td>
</tr>
<tr>
<td>Supervisors</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>QA Specialists</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Trainer</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Workforce Team (Shared with HIB)</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Notes:**
- Call volume forecast is based on average handle time of 10.27 minutes (616 seconds)
- Staff plan includes workload for phone, office visits, and email activity
- There is potential to use new supervisors as quality assurance or trainers at the beginning of the expansion to support hiring and learning curve
- *Includes 11 additional telephone counselors hired in anticipation of vacancies*
### ICMI Recommended Staffing Level Plans

#### Health and Insurance Benefits Division

<table>
<thead>
<tr>
<th>Position</th>
<th>Service Level Objective</th>
<th>Current TRS Staff</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80% in 180 Seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>80% in 60 Seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counselors (Office and Telephone)</td>
<td>50</td>
<td>56</td>
<td>20*</td>
</tr>
<tr>
<td>Supervisors</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>QA Specialists</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Trainer</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Notes:
- Call volume forecast is based on average handle time of 31.75 minutes (1,905 seconds)
- Staff plan includes workload for phone, office visits, and email activity
- There is potential to use new supervisors as quality assurance or trainers at the beginning of the expansion to support hiring and learning curve
- *Includes 2 additional counselors to support TEAM
What’s Needed for Successful Implementation

• Additional staff to:
  – address increased customer service demands and ensure TRS meets required service-level requirements
  – more accurately forecast staffing needs and analyze workforce needs
  – provide training and development directly related to contact center needs
  – increase quality assurance reviews and measure all channels (email, office, phone, online chats)
  – provide IT support and development for call center technology

• Investments in new technologies (ACD, IVR, quality monitoring, workforce management)

• Redesigned work spaces to create a more conducive, collaborative work environment

• Centralization of all shared service support functions for greater support and economies of scale

• Member meeting rooms moved to more accessible locations
TRS Acronyms

- HIB: Health and Insurance Benefits Division
- BC: Benefit Counseling includes telephone call center and office visit counselors (Benefit Services)
- TCC: Telephone Counseling Center (Benefit Services)
- QA: Quality Assurance team evaluates member interactions to ensure information is conveyed accurately and in a consistent manner
- L&D: Learning and Development
- Contact Centers: HIB and Benefit Services call centers and office visit employees
- WFM: Workforce Manager
- IVR: Integrated Voice Response
- ACD: Automatic Call Distribution
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Laura Grimes, ICMI Senior Certified Consultant
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Todd Piccuillo, ICMI Services Sales Director
203.242.6632
tpiccuillo@icmi.com
Moving Forward
to Better Serve Our Members

Janet Bray, Human Resources
February 24, 2017
## TRS Employee Profile

<table>
<thead>
<tr>
<th><strong>Average Age</strong></th>
<th><strong>Average TRS Tenure</strong></th>
<th><strong>FY 2016 Turnover Rate</strong></th>
<th><strong>Ethnicity</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>45.7 Years</td>
<td>7.9 Years</td>
<td>10.7%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Gender</strong></th>
<th><strong>Average State Tenure</strong></th>
<th><strong>Employees Eligible to Retire</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>56% Female</td>
<td>12.09 Years</td>
<td>15.7%</td>
</tr>
<tr>
<td>44% Male</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Based on rule of 80

- White (60%)
- Hispanic (22%)
- Black (11%)
- Asian/American Indian (6%)
## Workforce: By Decade Born

<table>
<thead>
<tr>
<th>Decade</th>
<th>Average Age</th>
<th>TRS Tenure</th>
<th>Average Years to Retirement*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940's</td>
<td>70.4</td>
<td>9.3</td>
<td>(6.8)</td>
</tr>
<tr>
<td>1950's</td>
<td>61.0</td>
<td>10.7</td>
<td>(0.8)</td>
</tr>
<tr>
<td>1960's</td>
<td>51.7</td>
<td>11.4</td>
<td>6.0</td>
</tr>
<tr>
<td>1970's</td>
<td>42.0</td>
<td>6.9</td>
<td>14.3</td>
</tr>
<tr>
<td>1980's</td>
<td>32.6</td>
<td>3.4</td>
<td>21.7</td>
</tr>
<tr>
<td>1990's</td>
<td>25.3</td>
<td>1.7</td>
<td>26.2</td>
</tr>
</tbody>
</table>

*Note: Based upon rule of 80
### Distribution of Positions by Division

<table>
<thead>
<tr>
<th>Division</th>
<th>Benefit Services</th>
<th>Investment Management</th>
<th>Information Technology</th>
<th>Executive</th>
<th>Finance</th>
<th>Health and Insurance Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Workforce</td>
<td>29.2%</td>
<td>21.7%</td>
<td>15.4%</td>
<td>14.8%</td>
<td>13.1%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Departments</td>
<td>Benefit Counseling • Benefit Payments • Benefit Processing • Benefit Reporting</td>
<td>Global Equity • Stable Value • Real Return • Risk Management • Investment Operations</td>
<td>Enterprise Infrastructure Services • Client Services • Information Systems Support and Development • Information Systems Architecture • Information Security</td>
<td>Communications • Government Relations • Legal Services • Internal Audit • Human Resources • Strategic Initiatives</td>
<td>Budget • Financial Reporting • General Accounting • Staff Services • Records Management</td>
<td>HIB Finance • HIB Operations</td>
</tr>
</tbody>
</table>
• Positions are paid by pension, TEAM or Health Care funds

• Positions may be filled or unfilled (waiting to post and hire)

• Contractors, consultants and other vendors to are used to supplement staff depending upon project and business needs
### Divisional Turnover Rates

<table>
<thead>
<tr>
<th>Division</th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance Division</td>
<td>14.1%</td>
<td>10.4%</td>
<td>18.2%</td>
</tr>
<tr>
<td>Executive Division*</td>
<td>13.2%</td>
<td>4.6%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Health Insurance and Benefits</td>
<td>9.4%</td>
<td>13.7%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Investment Management Division</td>
<td>8.0%</td>
<td>8.0%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Benefit Services</td>
<td>7.0%</td>
<td>12.4%</td>
<td>10.9%</td>
</tr>
<tr>
<td>Information Technology</td>
<td>2.1%</td>
<td>10.9%</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

**TRS Total** 9.6% 9.7% 10.7%

*Note: Executive Division includes Legal, Internal Audit, Communications, Government Relations, HR and Organizational Excellence, Project Management Office and Strategic Initiatives*
## TRS Retirement Eligibility Projections

<table>
<thead>
<tr>
<th>Department</th>
<th>January 2017</th>
<th>January 2019</th>
<th>January 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eligible Employees</td>
<td>Percent Eligible</td>
<td>Eligible Employees</td>
</tr>
<tr>
<td>Executive Division**</td>
<td>27</td>
<td>27.8%</td>
<td>34</td>
</tr>
<tr>
<td>Investment Management</td>
<td>6</td>
<td>4.2%</td>
<td>8</td>
</tr>
<tr>
<td>Benefit Services</td>
<td>25</td>
<td>13.1%</td>
<td>38</td>
</tr>
<tr>
<td>Finance</td>
<td>18</td>
<td>20.9%</td>
<td>28</td>
</tr>
<tr>
<td>Information Technology</td>
<td>23</td>
<td>22.8%</td>
<td>34</td>
</tr>
<tr>
<td>Health &amp; Insurance Benefits</td>
<td>4</td>
<td>10.5%</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>15.73%</strong></td>
<td><strong>147</strong></td>
</tr>
</tbody>
</table>

| Executive Council Members                | 4            | 30.8%        | 6            | 46.2%        | 6            | 46.2%        |

**Notes:**
*Estimates are based on the rule of 80 using active employees as of 12/31/2016 and includes return-to-work retirees.

**Executive Division includes Legal, Internal Audit, Communications, Government Relations, HR and Organizational Excellence, Project Management Office and Strategic Initiatives.
Succession Planning Process

1. Identify critical positions and high potentials
2. Assess high potentials, identify skill gaps and gauge readiness
3. Create development plans for high potentials
4. Launch development activities and resources for high potentials
5. Monitor, evaluate and report on progress of high potentials
6. Fill critical positions with high potentials as appropriate
7. Collect feedback on process from high potentials and management

Knowledge Transfer for Critical Positions (ongoing)
• An FTE is a ratio used to represent the equivalent of a 40 hour/week employee

• For the purposes of reporting data, only FTEs from the trust fund count against our legislative cap of 503.3

• With Board approval, agencies have the authority to exceed the FTE cap by 10% (max of 50 FTEs)

• TRS anticipates the need to exceed that cap in FY 2017, but we will still remain within our approved budget

FTE Calculation Example

Formula:
\[
\frac{\text{Total hours paid in a quarter}}{\text{Number of work hours in a quarter}} = \text{FTEs}
\]

Example – FY 2017, Q1:

\[
\frac{264,491.04 \text{ hours paid}}{528 \text{ work hours}} = 500.93 \text{ FTEs}
\]
FTE History by Quarter

FTEs Subject to Cap  FTE Cap

FY 2015 Q1: 488.7
FY 2015 Q2: 489.9
FY 2015 Q3: 486.1
FY 2015 Q4: 496.8
FY 2016 Q1: 492.5
FY 2016 Q2: 501
FY 2016 Q3: 497.6
FY 2016 Q4: 502.7
FY 2017 Q1: 500.93

FY 2015 Q4: 503.3
FY 2016 Q1: 503.3
FY 2016 Q2: 503.3
FY 2016 Q3: 503.3
FY 2016 Q4: 503.3
FY 2017 Q1: 503.3
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care Funds</td>
<td>15.9</td>
<td>30.7</td>
<td>50.6</td>
<td>51.2</td>
<td>48.9</td>
<td>54.2</td>
<td>57.4</td>
<td>59.5</td>
<td>61.0</td>
</tr>
<tr>
<td>TEAM</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5.1</td>
<td>11.6</td>
<td>44.0</td>
<td>57.0</td>
<td>67.5</td>
</tr>
<tr>
<td>Trust Fund</td>
<td>377.2</td>
<td>419.9</td>
<td>445.5</td>
<td>466.2</td>
<td>459.6</td>
<td>467.3</td>
<td>485.7</td>
<td>495.1</td>
<td>501.7</td>
</tr>
<tr>
<td>FTE Cap</td>
<td>475.3</td>
<td>475.3</td>
<td>487.3</td>
<td>490.3</td>
<td>503.3</td>
<td>503.3</td>
<td>503.3</td>
<td>503.3</td>
<td>503.3</td>
</tr>
</tbody>
</table>

FTE Historical Trend
Excluding TEAM and IMD, the FTE count has risen only 8.9%.
According to data from CEM (benefit services peer study), compared to our peers, TRS effectively maximizes workforce resources*

<table>
<thead>
<tr>
<th></th>
<th>Cost Per Member</th>
<th>Salaries and Benefits per Pension FTE</th>
<th>Productivity per FTE (weighted transaction volume per FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRS</td>
<td>$29</td>
<td>$72,922</td>
<td>253,442</td>
</tr>
<tr>
<td>Peer Average</td>
<td>$92</td>
<td>$88,308</td>
<td>128,057</td>
</tr>
</tbody>
</table>

Cost per member is 69% below other peer funds
Salaries and benefits per pension FTE are 13% below peers
Productivity per FTE is 97% higher than peers

*Note: Data based on FY 2015 survey results which were released in June 2016
An increase in the 4.9% range would be appropriate based on workload demand. That would be 25 additional FTEs through FY2019.

<table>
<thead>
<tr>
<th>Divisions with Requests</th>
<th>Requested FTEs</th>
<th>Current FTEs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit Services</td>
<td>10</td>
<td>153.3</td>
<td>• Call wait time metric is 80% of calls answered within 3 minutes; we are currently at 61%; • Workload analysis showed a demand for 10 additional FTEs to meet performance metrics and to handle additional phone calls</td>
</tr>
<tr>
<td>IT Division</td>
<td>7</td>
<td>70</td>
<td>• The transition to a post TEAM environment will require TRS to support 400+ new servers and 30+ new applications • Currently 120 contractors are on site working on the implementation • IT management recommends 19 additional FTEs to provide continued support of the additional infrastructure</td>
</tr>
<tr>
<td>Investment Management</td>
<td>2</td>
<td>142</td>
<td>• Investment operations analyst and IT analyst to support deal flow activity and to more effectively manage investment operations</td>
</tr>
<tr>
<td>Agency Administration and Support</td>
<td>6</td>
<td>68.5</td>
<td>• Additional audit staff will expand TRS’s ability to verify reported employer data as required by revised audit standards • Additional communications support is needed to enhance the end user capabilities of the redesigned TRS website • Additional legal support is needed to properly vet complicated investment opportunities to ensure compliance and suitability • Training staff to support contact center operations</td>
</tr>
</tbody>
</table>
TAB 27
Moving Forward
to Better Serve Our Members

403(b) Rule Review, Rebecca Merrill, Director of Strategic Initiatives and Dan Pawlisch, Aon Hewitt
403(b) Registration Program

Allowable Fees
- 6% combined front-and back-end sales load
- 2.75% asset-based (annually)
- 10% surrender/withdraw
- $50 loan Initiation
- $50 administrative (annually)

Operations
- Maintain and update web site for members to compare products
- 76 certified companies
- Over 11,000 registered product options

Funding
- State law allows fees for program sustainability
- $3,000 per certification and per registration
- Certification and registration renewed every five years
September 2016: Initiate 4-year rule review

December 2016: 403(b) Informal Conference

January – March 2017: Identify Rule Improvements

April 2017: Public Comment Publication of Proposed Rule Amendments

June 2017: Adopt Final Proposed Rule Amendments and Close Rule Review
Modernization of 403(b) Rules

Terminology
Updating rule terminology to better match the current 403(b) market.

Required Information
Identifying additional vendor information to help consumers make more informed choices.

Fees
Examine whether fee caps for allowable charges are appropriate for current market.
Teacher Retirement System of Texas
403(b) Program Review
February 24, 2017

Aon Hewitt
Retirement and Investment

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

Nothing in this document should be construed as legal or investment advice. Please consult with your independent professional for any such advice. To protect the confidential and proprietary information included in this material, it may not be disclosed or provided to any third parties without the approval of Aon Hewitt.
Defined Contribution Practices

- 403(b) retirement programs have historically been implemented through a multi-provider record keeper platform where employees choose their investments from a “menu” of retirement plan providers.

- In response to growing marketplace concerns, the industry has started to adopt several “best practices” designed to improve retirement readiness for their participants.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Current Paradigm</th>
<th>Emerging Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration Fees</td>
<td>Bundled</td>
<td>Decouple from investments</td>
</tr>
<tr>
<td>Investment Fees</td>
<td>“It’s free”</td>
<td>Transparent and reasonable</td>
</tr>
<tr>
<td>Investment Options</td>
<td>More is better</td>
<td>Fewer, focused, tiered structure</td>
</tr>
<tr>
<td>Vendors</td>
<td>Multiple record keepers</td>
<td>Reduced number of record keepers</td>
</tr>
</tbody>
</table>
Administrative Fees

- Plans administration is currently supported by vendors who use shareholder servicing fees (revenue sharing) to reduce the apparent costs of plan administration.

- The practice of embedding the costs of administrative service in asset charges creates an environment where:
  - Members typically do not know how much they are paying for the services they receive.
  - Most members continue to operate under the false notion that their retirement plan is “free.”

- Based on our experience and research, it is not uncommon for shareholder servicing reimbursements to more than offset many defined contribution plans recordkeeping costs.

- We recognize that many of these costs are in place to support an inefficient system that is based on a retail model of gathering assets and distributing benefits.
Administrative Fee Benchmarking

**Step 1**
- Collect data
  - Plan Demographics
  - Plan Provisions
  - Plan Investments
  - Evaluate:
    - Plan size
    - Plan complexity

**Step 2**
- Perform Analysis
  - Determine relevant comparables
  - Extract data from appropriate source
  - Fee Benchmark Database
  - Live Fee Benchmarks
  - Total Plan Cost Database

**Step 3**
- Present Results
  - Fee calculation
  - Benchmark based on services received
  - Plan Analysis

Results in 6-8 weeks
### Investment Fees and Expenses

#### Areas of Focus

<table>
<thead>
<tr>
<th>Focus</th>
<th>Description</th>
</tr>
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</table>
| As compared to similar investments; paying more may be appropriate if the fund investment manager is earning its higher fee | If the least expensive investment vehicle is not in use, there must be a thoughtful reason.  
 **CAUTION:** An apparently lower cost share class may not be the best for members |
| Other fees, including transactional fees. Which parties pay fees and are levels appropriate? | Reasonable expense ratios for investment vehicles  
Least expensive available share class or other investment vehicle  
Other fees and expenses |

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The Impact of Fees and Expenses

- An investment with high costs must perform better than a low-cost investment in order to generate the same return for a member.
- Lowering fees will have a significant impact on members’ account balances.
- Even small differences in fees can translate into large differences in returns over time.

Reducing fees or improving performance by 25 basis points...

...has the same value as...

Increasing member’s contribution 0.5% of pay for a full career employee.

*Assumes contribution of 10%. Full-career defined as 35 years.
Members’ Cost for Suboptimal Asset Allocation

- Suboptimal diversification cost more than 50% of the participants at least 30 bps of performance.
- The 30 bps performance loss over a participant’s career could cost them 0.7x of final pay.

¹Source: Aon Hewitt
How will Members Benefit?

- We illustrate the impact of a 0.2% fee reduction or an increase in annual return of 0.2% on members’ account balances in the exhibit below.

**Assumptions:**
Participant saves 5% per year starting at age 25, increasing to 7.5% at 35, investment return of 6.0%, receives annual 2% salary increases, and retires at age 65.