Joint Meeting of the Board of Trustees and Investment Advisory Committee

February 22, 2017

Presented for Review and Approval

May 17, 2017

Table of Contents

IV. REVIEW AND APPROVAL OF THE MINUTES TO THE DECEMBER JOINT MEETING OF THE BOARD OF TRUSTEES AND INVESTMENT ADVISORY COMMITTEE 4

V. REVIEW, DISCUSSION AND CONSIDERATION OF ERS' REAL ESTATE CONSULTANT 4

VI. REVIEW AND DISCUSSION OF ERS' ASSET ALLOCATION AND LIABILITY STUDY: REVIEW AND DISCUSSION OF UPDATED CAPITAL MARKET ASSUMPTIONS, ASSET MIXES, AND PORTFOLIO STRESS 6

VII. REVIEW AND DISCUSSION OF THE INVESTMENT ADVISORY COMMITTEE 13

a.Eligibility and Compliance for Calendar Year 2016 of the IAC 13

b.IAC Self Evaluation Report 14

c.Board of Trustees Survey of the IAC 15

VIII. REVIEW AND DISCUSSION OF THE INVESTMENT PERFORMANCE FOR FOURTH CALENDAR QUARTER OF 2016 15

IX. REVIEW, DISCUSSION AND CONSIDERATION OF THE GLOBAL PUBLIC EQUITY PROGRAM 18

a. Market Update and Program Overview 18

b. Review and Discussion of Global Public Equity External Advisor Program 23

c. Proposed Revisions to the ERS Investment Policy Addendum XI – Global Public Equity Policies and Procedures and External Advisor Program Tactical Plan 26

X. ANNUAL REVIEW AND DISCUSSION OF PROXY VOTING AND CORPORATE GOVERNANCE 27

XI. REVIEW, DISCUSSION AND CONSIDERATION OF THE PRIVATE INFRASTRUCTURE PROGRAM 28

a. Market Update and Program Overview 28

b. Proposed Private Infrastructure Annual Tactical Plan for Fiscal Year 2017-2018 32

JOINT MEETING OF THE
BOARD OF TRUSTEES AND
INVESTMENT ADVISORY COMMITTEE
EMPLOYEES RETIREMENT SYSTEM OF TEXAS

February 22, 2017
ERS Building – Board Room
200 E. 18th Street
Austin, Texas 78701

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

IAC PRESENT
James Hille, Chair
Caroline Cooley, Vice Chair
Bob Alley, Member
Ken Mindell, Member
Laura Starks, Member
Lenore Sullivan, Member

ERS STAFF PRESENT
Porter Wilson, Executive Director
Catherine Terrell, Deputy Executive Director
Tom Tull, Chief Investment Officer
Sharmila Kassam, Deputy Chief Investment Officer
Paula A. Jones, Deputy Executive Director and General Counsel
Leighton Shantz, Investments
Shack Nail, Special Projects and Policy Advisor
Tony Chavez, Internal Auditor
Robin Hardaway, Director of Customer Benefits
Chuck Turner, Chief Information Officer
Kelley Davenport, Executive Office
Liz Geise, Benefits Communications
Jennifer Jones, Executive Office
Betty Martin, Investments
Pablo de la Sierra Perez, Investments
Chineque Sterns, Human Resources
Tanna Ridgway, Investments
Machelle Pharr, Chief Financial Officer
Keith Yawn, Executive Office
John Streun, Investments
Andrew Hodson, Investments
Chris Tocci, Investments
Christi Davis, Customer Benefits
Robert Sessa, Investments
Gabrielle Stokes, Director of Procurement and Contract Oversight
Carlos Chujoy, Investments
Mike Ewing, Office of General Counsel
Nancy Lippa, Office of General Counsel
Amanda Burleigh, Office of General Counsel

Kathryn Tesar, Director of Benefits Communication
Lauren Honza, Investments
Stuart Williams, Investments
Satitpong, Chantarajirawong, Investments
Leah Erard, Executive Office
Beth Gilbert, Internal Audit
Jonathan Puckett, Internal Audit
Michael Shoop, Investments
Panayiotis Lambropoulos, Investments
Bailey Crowell, Executive Office
Flavia de la Fuente, Investments
Mike McCrary, Investments
Tim Reynolds, Investments
Nick Maffeo, Investments
Neil Henze, Investments
John McCaffrey, Investments

VISITORS PRESENT
Kristen Doyle, Aon Hewitt Investment Consultants
Jas Thandi, Aon Hewitt Investment Consultants
Steve Voss, Aon Hewitt Investment Consultants
Michael McCormick, Aon Hewitt Investment Consultants
Bill Hamilton, Retired State Employees Association
Emily Johnson, Sunset Commission
Gabriel Rodriguez, Empiric/NASP
David Rose, Aon Hewitt Investment Consultants
Lyhnn Gordon, Securian
Brad Young, Pavilion
Jay Yoder, Pavilion
Philip Cote, Pavilion
Catherine Melvin, Texas Department of Public Safety
Kirk Lavaller, Delta Dental
Reed Hutchens, Franklin Templeton
Meghan Onfici, Institutional Shareholder Services
Fassil Michael, Institutional Shareholder Services

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

> "A public notice of the Joint Meeting of the Board of Trustees and Investment Advisory Committee containing all items in the proposed agenda was filed with the Office of the Secretary of State at 12:08 p.m. on Monday, February 13, 2017, as required by Chapter 551, Texas Government Code, referred to as the Open Meetings law."

Mr. Craig Hester, Chairman of the Board of Trustees (Board) for the Employees Retirement System of Texas (ERS), also read the following statement:

> "A public notice of the Joint Meeting of the Board of Trustees and Investment Advisory Committee containing all items in the proposed agenda was filed with the Office of the Secretary of State at 12:08 a.m. on Monday, February 13, 2017, as required by Chapter 551, Texas Government Code, referred to as the Open Meetings law."

IV. REVIEW AND APPROVAL OF THE MINUTES TO THE DECEMBER JOINT MEETING OF THE BOARD OF TRUSTEES AND INVESTMENT ADVISORY COMMITTEE

Mr. Jim Hille, Investment Advisory Committee (IAC) Chair, opened the floor for a motion on the approval of the minutes from the December 1, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee.

The Investment Advisory Committee then took the following action:

> **MOTION** made by Ms. Caroline Cooley, seconded by Mr. Ken Mindell, and carried unanimously by the members present that the Investment Advisory Committee approved the minutes of the December 1, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee.

The Board of Trustees then took the following action:

> **MOTION** made by Ms. Cydney Donnell, seconded by Ms. Ilesa Daniels, and carried unanimously by the members present that the Board of Trustees approved the minutes of the December 1, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee.

V. REVIEW, DISCUSSION AND CONSIDERATION OF ERS' REAL ESTATE CONSULTANT

Mr. Bob Sessa, Director of Real Estate, and Mr. Davis Rose, Partner at AON Hewitt Global Research Team, presented the review, discussion, and consideration of ERS' Real Estate Consultant.

Mr. Sessa informed the Board that on February 3, 2017, ERS was notified that the real estate team at RVK, Inc (RVK) had left the company to start their own firm. On February 13, ERS terminated the contract with RVK after determining the remaining available resources were not sufficient to meet ERS' needs. ERS Investments staff (staff) then met with the Office of General Counsel (OGC) and the Office of Procurement and Contract Oversight (OPCO) to discuss next steps.

After much consideration, staff, along with OGC and OPCO, decided the best course of action would be to contract with a real estate consultant for an interim period from one of the three existing ERS consulting contracts. These are Aon Hewitt Investment Consultants (AHIC), ERS' general consultant; Pavilion Financial Corporation (Pavilion), private equity and infrastructure consultant; and Albourne Partners Ltd (Albourne), hedge funds consultant. After conducting due diligence, it was determined that AHIC was the best fit for ERS' needs during the interim period. The existing contract with AHIC was broad enough to encompass real estate consulting services within it, but it will also be amended to reflect the new mandate. Mr. Sessa noted that the scope of services will be limited as compared to the previous scope with RVK.

ERS has begun the formal solicitation process to find a permanent replacement, and staff will be presenting recommendations to the Board of Trustees (Board) and Investment Advisory Committee (IAC), most likely at the December joint meeting.

Ms. Caroline Cooley, IAC Vice-chair, asked whether staff was in the process of searching or closing on any real estate deals at the time of termination of RVK. Mr. Sessa responded that ERS had closed on three deals just prior to the termination and that, looking forward, there are no final closing deadlines in danger of being missed. However, there are always ongoing deals in the portfolio pipeline.

Mr. Doug Danzeiser, Board Vice-chair, commented that it was fortunate to be able to take advantage of existing consulting contracts, but asked what would have been done had the existing contracts not been in place. Ms. Gabrielle Stokes, Director of OPCO, responded that while emergency procurements are not preferable, they are an option in order to protect safety or property. In this particular case, an emergency procurement could have been done to protect ERS' assets.

Ms. Stokes emphasized the importance of due diligence and competitive bids during the procurement process. For this reason, staff was very pleased to be able to employ an interim consultant and take the appropriate amount of time to carry out the process properly. Ms. Stokes also highlighted the due diligence performed with regards to selecting the interim consultants. AHIC was chosen after careful discussion and review of all existing consultants' resources and contracts.

Mr. Sessa noted that ERS is not required or mandated by the investment policies and procedures to contract with a Real Estate consultant. However, staff has determined that having a consultant is prudent and adds value.

Ms. Paula Jones, Deputy Executive Director and General Counsel, added that from a fiduciary standpoint, particularly given the internal audit report, the use of consultants in these fields is a key control. For this reason, the termination of RVK did require emergency action, and it was fortunate that the existing contracts made it a simple process to hire an interim consultant while the permanent solicitation was developed for a longer-term solution.

Mr. Rose presented a general history and overview of the AHIC Global Real Estate team. AHIC has been consulting in the field of Real Estate for over 30 years but began their dedicated team in 2005. This team works with over 100 clients and provides such services as asset class education, strategic planning, investment manager due diligence and selection, and portfolio performance reporting and monitoring. They cover wide ranging strategies in both public and private real estate. They cover debt and equity, as well as some tangential real estate, such as farmland and timber. The team averages over 400 meetings with investment managers per year, evaluating new opportunities and monitoring existing holdings of clients.

The team is spread across the US, UK, and Canada, with capabilities across many disciplines: market research, portfolio administration, asset management, real estate accounting, appraisal, plan sponsors, and even architecture. Mr. Rose highlighted Catherine Polleys, Partner and Co-head of Global Real Estate, who, in addition to co-heading the US AHIC real estate practice, is also a past President and current board member of the National Council of Real Estate Investment Fiduciaries (NCREIF).

Mr. Rose has been with the AHIC real estate team for nine years, and previously worked for an opportunistic real estate firm in Chicago called Walton Street Capital. He started his career at PricewaterhouseCoopers in the audit practice, working on real estate.

Some additional resources are the Private Market Reporting and Compliance team, who help create performance reports specifically for real estate and private equity portfolios, and the Operational Due Diligence (ODD) team, who are able to offer expertise.

Mr. Craig Hester, Board Chair, asked what the fee was for the interim engagement. After confirming that it was allowed to discuss fees publicly, Mr. Sessa explained that the fees are built on an a la carte structure. As Mr. Sessa mentioned previously, the engagement will be limited in scope, so the services provided will be quarterly reporting and ad hoc fund due diligence. Mr. Sessa noted the fees and explained that a comparison to other fees is difficult due to the a la carte versus bundled structure.

The Investment Advisory Committee then took the following action:

> **MOTION** made by Ms. Caroline Cooley, seconded by Ms. Laura Starks, and carried unanimously by the members present that the Investment Advisory Committee recommend the Board of Trustees of the Employees Retirement System of Texas select Aon Hewitt Investment Consulting, Inc. to provide ERS with real estate consulting services as described in the agenda item and authorize the Executive Director to negotiate and execute a contract amendment fully satisfactory to ERS and thereafter to administer it in accordance with its terms.

The Board of Trustees then took the following action:

MOTION made by Mr. Doug Danzeiser, seconded by Mr. Brian Ragland, and carried unanimously by the members present that the Board of Trustees select Aon Hewitt Investment Consulting, Inc. to provide ERS with real estate consulting services as described in the agenda item and authorize the Executive Director to negotiate and execute a contract amendment fully satisfactory to ERS and thereafter to administer it in accordance with its terms.

VI. REVIEW AND DISCUSSION OF ERS' ASSET ALLOCATION AND LIABILITY STUDY: REVIEW AND DISCUSSION OF UPDATED CAPITAL MARKET ASSUMPTIONS, ASSET MIXES, AND PORTFOLIO STRESS

Mr. Tom Tull, Chief Investment Officer, Ms. Sharmila Kassam, Deputy Chief Investment Officer, and Steve Voss and Kristen Doyle, AON Hewitt Investment Consultants (AHIC), presented the review and discussion of ERS' asset allocation and liability study, updated capital market assumptions, asset mixes, and portfolio stress.

Mr. Tull began by reminding the Board and IAC of their discussion regarding capital market assumptions at the December 16, 2016 Joint Meeting of the Board and IAC. The purpose of this working session was to extend that discussion and further refine updated assumptions. Mr. Tull noted that the updated capital market assumptions reflect minor adjustments due to the new administration and the changing external market environment.

Ms. Kassam introduced the updated capital market assumptions. While most assumptions were unchanged from previous estimates, Ms. Kassam highlighted an increase in the return expectations for opportunistic/private credit, intermediate treasuries, and cash, and a decrease for high yield instruments. For the updated capital market assumptions, see exhibit A.

Dr. Laura Starks, IAC member, asked a question regarding how ERS staff and AHIC arrived at these updated figures. Ms. Kristen Doyle, AHIC, joined to respond that the previous high yield assumption was developed at a time when there was dramatic spread widening in the space, a trend that has reversed in the interim. This subsequent move towards spread contraction led to the downward adjustment in expected return for the high yield portfolio. The increase in the opportunistic/private credit return expectation is linked to the dramatic increase that has been seen in the LIBOR rate. Intermediate treasuries and cash were similarly increased due to the rising interest rate environment seen since the US Presidential election.

Ms. Kassam reminded the Board and IAC that the capital market assumptions are a starting point in determining the magnitude of the various returns and performing further refinement and analysis.

Mr. Craig Hester, Board Chair, asked whether the spread between the inflation expectation and return assumption for intermediate treasuries should be larger. Mr. Jas Thandi, AHIC, responded that the yield curve for bonds is expected to flatten, which means that short-term bond returns are expected to rise much faster than intermediate and long-term bonds. This is due to rising interest rates causing longer duration bonds to lose value and results in the smaller spread that is shown.

Mr. Ken Mindell, IAC member, remarked that the assumption for the absolute return portfolio is a spread over the risk free rate. Thus, an increase in expected return for risk free instruments should result in a corresponding increase in expected return for that asset class.

Ms. Kassam responded that the goal of the absolute return portfolio is to reduce risk within the total fund rather than primarily seek a return. Staff utilizes specific strategies within the asset class in order to achieve this purpose of diversification. Given these strategies, and in order to maintain the portfolio's beta target, staff and AHIC arrived at the expected return.

Ms. Cydney Donnell, Board member, asked whether the return assumptions for real estate, infrastructure, and private equity were general estimates or customized to reflect ERS' specific portfolios. Ms. Kassam responded that the assumptions for these asset classes were customized based on the portfolio constructions targeted by ERS policy. Additionally, staff and AHIC worked together to further customize the assumptions to reflect specific considerations where ERS may diverge from the baseline assumption, such as strategy and geography of investments.

Ms. Jeanie Wyatt, Board member, asked how the return assumption for the absolute return portfolio compared to the previous 10-year benchmark for the asset class. Mr. Steve Voss, AHIC, responded that although he did not have that data on hand, his best estimate would place the previous benchmark slightly lower than the future expected return. This is due to difficulty faced by hedge funds over the last five years as public equities have performed exceptionally well.

Mr. Tull located the data and reported that the benchmark was indeed slightly lower, with staff outperforming the benchmark over that period. Mr. Tull clarified that this was over a five year horizon, to align with the asset class inception date.

Ms. Kassam presented the current long-term policy target allocation and where the actual total fund allocation fell as of December 31, 2016. Taking this target allocation, adopted in February of 2013, and applying the updated return and volatility capital market assumptions, the total trust return estimate was 6.9%; volatility was 12.0%; and Sharpe ratio was 0.374.

Given these allocations and assumptions, Ms. Kassam expressed a low probability of the trust achieving the 8.0% actuarial return. She then passed the presentation to AHIC to discuss proposed alternative allocation mixes and encouraged dialogue from the Board and IAC to attain their perspective on the matter.

Ms. Doyle explained that the overall purpose of these discussions was to ascertain a high level estimate of risk tolerance in order to determine the allocation of funds to overall risk-reducing versus return-seeking assets. The current conversation at this meeting was to determine more specific perspectives on the allocation of assets within the return-seeking portion of the trust.

Ms. Doyle then presented the three proposed alternative allocation mixes titled "Risk-reducing", "Enhanced Return", and "Diversified." The Risk-reducing mix decreases the allocation to Global equity and increases the allocation to a new potential asset class called opportunistic/private credit. This results in a slightly lower return at a much lower level of risk, as measured by the deviation around the return expectation.

The Enhanced Return mix decreases the allocation to Global equity and the Rates portfolio and increases the allocation to the private equity, Global Credit, and Infrastructure asset classes. This mix results in a slightly higher level of both risk and return.

The Diversified mix decreases the allocation to Global equity, Global Credit and the Rates portfolio and increases the allocation to private equity, real estate, Infrastructure, and the new opportunistic/private credit asset class. This results in a slightly higher return at a slightly lower level of risk. For further details, see exhibit B.

Mr. Voss added that these three allocations were taken from a much larger list of proposed options discussed with staff. He emphasized that there were no iterations discussed, including those presented, that were able to prudently achieve the 8% actuarial return given current capital market assumptions. Private equity is the only asset class expected to generate a return in excess of 8%, and it is not reasonable to allocate all trust assets into that portfolio. Thus, the goal becomes fine tuning and enhancing the efficiency of the portfolio, taking advantage of areas currently lacking in exposure.

Ms. Doyle noted that these allocations were the product of extensive discussions between staff and

AHIC with the purpose of deploying capital into under-allocated areas of opportunity. Out of these discussions also came the emergence of the newly proposed opportunistic/private credit asset class.

Ms. Donnell asked for further discussion regarding the liquidity of assets within the proposed allocations. Ms. Doyle responded that AHIC uses a very robust liquidity model that considers multiple factors, including benefit payments and contributions, and is able to stress test those factors based on different market environments. The presentation of liquidity will be provided in a future meeting.

Mr. Jim Hille, IAC Chair, asked a question regarding the tradeoff of maintaining liquidity and increasing returns. Ms. Doyle acknowledged this tradeoff, discussing the overall allocation to return-seeking versus risk-reducing assets within the three proposed scenarios. She noted that a core role of risk-reducing assets is providing liquidity, resulting in the Risk Reduction mix having a larger allocation towards risk-reducing assets relative to the Enhanced return mix.

Dr. Starks reiterated the ability to enhance long-term returns through more illiquid assets and expressed a preference for doing so. Chairman Hester expressed his concern that increases to return assumptions appear to be very small given the corresponding decreases to liquidity.

Mr. Mindell agreed with Chairman Hester but expressed more concern for returns than liquidity. He further commented that in order to significantly increase returns, the trust will have to take on much more liquidity risk and invest far more in alternative assets classes.

Ms. Cooley expressed her concern with the trust becoming too illiquid as well; however, she highlighted the importance of being selective as to which illiquid asset classes are allocated funds. In particular, she spoke to the high level of increased risk in private equity relative to the lower corresponding increase in return as compared to opportunistic/private credit.

Chairman Hester noted that global public equity has generally underperformed relative to expectations over the past 17 years. For this reason, and due to a general trend of funds migrating to other asset classes, he asked if global public equity had become the out-of-favor asset class and whether it may be a good idea to maintain its current allocation.

Mr. Mindell raised that there is reasonable liquidity in hedge funds and public equity, and that this liquidity within other asset classes may allow staff to take on more illiquid investments elsewhere to help meet return objectives.

Ms. Kassam noted that the liquidity levels of the individual assets within each class vary. Within the private equity asset class, for example, there is a significant allocation of funds to secondaries, which have lower return expectations but higher liquidity than other assets within the portfolio. Data on liquidity profiles for each asset class will be presented at future discussions on liquidity.

Mr. Mindell noted the added liquidity from coinvestments within less liquid asset classes as well. Ms. Donnell further emphasized the use of coinvestments in private asset classes and focused on their effect on liquidity and control within each portfolio.

Ms. Kassam responded that coinvestments are a large part of ERS' private asset class investments, particularly private equity and infrastructure. She noted that this will be further discussed during the private infrastructure presentation later in the meeting.

Ms. Cooley asked if the expected level of risk for the total trust is targeted or whether the value comes as an output of the model. Mr. Tull responded that it is an output. Staff has tracking error in terms of risk tolerance for the overall trust but doesn't factor that into the alternative side of the portfolio. Ms. Kassam added that staff considers the risk survey and a qualitative perspective of risk, and the recent results did not indicate interest in implementing significant changes to the existing risk profile.

Mr. Mindell asked whether this implementation would be through hedge fund strategies. Ms.

Kassam responded that opportunistic/private credit is a multi-asset class allocation. Ms. Doyle added that there are hybrid, drawdown structures. Ms. Kassam also commented that there will be further discussions with the Board and IAC regarding the controls, policy, and implementation of opportunistic/private credit.

Ms. Wyatt asked a question regarding a relatively low allocation to opportunistic/private credit given the favorable risk/return expectation in the updated capital market assumptions. Mr. Tull responded that opportunistic/private credit would be a new area of investment. Mr. Voss agreed and further elaborated that it would not be prudent to allocate too large a portion of the trust to an area so new. The allocation presented represents a starting point, which could be adjusted upward as staff became familiar and built the portfolio.

Ms. Cooley asked whether the relatively low allocation to opportunistic/private credit illustrated a lower level of confidence in the capital market assumption developed for that asset class. Mr. Voss responded the capital market assumptions are not presented as exact predictors of the future 10-year returns and volatilities for each asset class but, instead, as a directionally sound estimate on which to make asset allocation decisions. The assumptions are developed using a best-in-class, building block approach, and are not notably different from other practitioners in the market.

Ms. Cooley asked a question regarding the overlap between private equity and opportunistic/private credit. Mr. Voss responded that surveys of the Board and IAC indicated the preference for high level definitions of asset classes and to empower and allow staff to be more tactical and opportunistic within the ranges set and benchmarks established by the Board and IAC. Ms. Kassam added that opportunistic/private credit can serve as an avenue to take advantage of opportunities not suited for the private equity portfolio.

Mr. Bob Alley, IAC member, commented that investments in the opportunistic/private credit portfolio would be shorter term and rely on the ability to quickly rollover funds and find new investable opportunities. Ms. Kassam responded that staff has seen an abundance of opportunities to invest but was unable to do so due to deals not fitting into the definition of any of the existing asset classes. She further stated that from a historical perspective, when changes were made to the existing asset classes, they were funded as they were implemented. Until then, funds will remain in the public markets. A similar approach would be taken in this asset class. Mr. Hille added that a positive aspect of this is that fees in most opportunistic/private credit deals are on invested capital only.

Mr. Mindell asked in which areas staff sees the opportunity to invest tactically from the perspective of hedging and providing downside protection. Ms. Kassam responded that this question will be addressed further at future discussions on implementation. Staff is currently discussing opportunities, such as currency and global tactical allocation using derivatives.

Ms. Cooley asked a follow up question regarding whether there are strategies within the Absolute Return portfolio that are negatively correlated, as opposed to low correlated, with the rest of the fund. Mr. Tull responded that staff does consider these options when building the portfolios.

Mr. Tull posed a question to the Board and IAC as to whether they would prefer to see more allocation options than the three presented. Mr. Mindell responded affirmatively and requested allocation options that illustrate more dramatic changes to the risk/return tradeoff. He also suggested the inclusion of a liquidity measure for each option, as liquidity has been an important concern.

Ms. Cooley noted that because the capital market assumptions for each asset class were so similar, the total overall return assumption will move very little despite adjusting the allocation. Mr. Tull agreed and responded that there will need to be a higher level of magnitude in adjustments, but that this will be determined by the risk tolerance of the board, while also factoring in liquidity. Ms. Kassam added that it had been planned to take input from the current session to refine the mixes and aid further discussion with the Board and IAC.

Ms. Cooley asked whether there are methods of increasing the return assumptions within each asset class. For example, rather than limiting the Rates portfolio to treasury investments, would it be viable or prudent to include high grade corporate debt investments. Mr. Tull responded that this is a possibility and that staff seeks to be more opportunistic and take advantage of opportunities as they arise, while still maintaining the integrity of the asset class.

Ms. Doyle presented the probabilities of reaching the actuarial 8% versus a negative return in each of the three different allocations being presented. This is a method of stress testing each scenario to examine both upside potential and downside risk. She noted that the Enhanced Return mix increases the probability of reaching return objectives while maintaining the same downside risk relative to the current allocation. She then contrasted this against the Diversified mix, which increased the probability of reaching return objectives (at a slightly lower rate), but also decreased the downside risk.

Mr. Brian Ragland, Board member, asked for further clarification concerning the outputs of this model relative to current return expectations. Ms. Doyle provided further guidance. The model produces varying return expectations under each allocation mix by considering many factors, parameters, and assumptions which can and do change in real world markets. The return assumption presented for each mix is the 50th percentile return expectation, and the probability of achieving at least an 8% return is the percentage of cases that produced such a return given all the considerations under each specific allocation.

Mr. Mindell commented that this illustrates the larger issue, which is that the model is producing the actuarially necessary 8% return approximately only 30% to 40% of the time. For this reason, he suggested that it is necessary to make adjustments to either the mandated return expectation or the asset allocations.

Mr. Hille remarked that conversely, the trust must also consider the probability of loss, which would produce a subsequent increase to the amount of unfunded liability. He cautioned against accepting too much risk in order to chase returns, emphasizing the importance of certainty within the trust as well.

Ms. Doyle presented a series of stress tests on each of the proposed allocations, adjusting the level of various economic measures over a three year time horizon. Considering interest rates, all allocations performed better in rising rate environments, with the Enhanced Return and Diversified mixes performing better than the Risk Reducing.

Ms. Cooley made a comment to clarify her understanding of the presented data with regards to increased rates and the effect on the Fixed Income portfolio. Mr. Thandi explained that the model considers the effect on equity and other assets in addition to fixed income instruments, and that the data suggests that in a rising rate environment, the increased returns from other asset classes outpaces any decrease seen in the Fixed Income portfolio.

Ms. Lenore Sullivan, IAC member, further clarified that all the portfolios within the trust are aggregated in the model, so the Risk Reducing mix does well in a rising rate environment, but not as well relative to the other proposed allocations because the increased rates have a larger positive effect on those mixes. Ms. Doyle commented that if instead, we encounter a falling rate environment, the Risk Reducing allocation still underperforms the others, but by a smaller margin.

Ms. Doyle presented the results of stress testing considering varying levels of global equity returns over the next three years. Again, all portfolios performed better given higher equity returns, but the Enhanced Return portfolio performed better than the others as equity returns increased. Conversely, the Enhanced Return mix had less downside protection and performed worse relative to the other allocations when global equity returns were negative.

The results of stress testing considering different inflation assumptions showed no overall correlation trend for the various asset mixes. However, in general, the current and Enhanced Return allocations perform better in high inflation environments.

Mr. Mindell commented that the presented data stops at inflation of 3.8% and that higher-inflation environments (4, 5, or 6%) would result in a much larger impact on the returns of the portfolio. He also mentioned that when looking at the probability of funding liabilities, inflation is a large consideration as well and warrants further discussion.

Ms. Doyle presented the results of back-testing the proposed allocations against historical periods when markets were distressed. She noted that the Diversified mix performed best or second best in all but one time period, suggesting that diversification will allow the portfolio to be more resilient in different market environments.

Ms. Kassam suggested that it may be helpful to present the risk adjusted returns of each of the proposed asset allocations. Ms. Doyle explained that over both the last 10-year and 23-year periods, the Diversified mix would have outperformed the current and Risk Reducing allocations at a lower level of risk. During those same time periods, the Enhanced Return allocation would have outperformed all other mixes, but at a higher level of risk than the other two proposed alternatives.

Mr. Mindell highlighted that the recent periods of market distress saw negative returns as low as -28% and emphasized the need for hedging strategies and implementing downside protection. Ms. Sullivan asked to what extent the Diversified allocation is performing better on the downside than the other proposed mixes. She further inquired as to whether the differences shown could be the result of a smoothing effect or real outperformance, possibly in the form of current returns.

Ms. Doyle responded that the main contributing factor to the Diversified allocation's outperformance is the correlations between the various asset classes within the portfolio. Higher allocations to asset classes with lower correlation to the Public Equities result in more downside protection. Ms. Doyle noted that the proposed Diversified portfolio still has significant downside during periods of market distress due to a large allocation to Public Equities. Alternative allocation with significantly reduced allocations towards Public Equities warrant further discussion.

Mr. Mindell noted that of the five major corrections of over 15% since the Great Depression, two (of over 25%) occurred in the last decade. He asserted that this highlights even further the need for hedging and investigating options for downside protection.

Ms. Doyle presented the active risk exposure for the current and proposed asset allocations. While various risks contribute to the overall risk of the trust, such as residual, credit, interest rate, and inflation risk, the majority of the risk in all cases is attributed to the equity risk within the portfolio.

Mr. Hester commented that current ERS policy has ranges or bands built into allocation targets allowing staff to tilt the portfolio where they see opportunities. Mr. Tull responded that this is a benefit of the implemented methodology of portfolio management under the existing policy. It provides flexibility to act tactically within the asset classes and take advantage opportunistically. Nothing happens within a vacuum, and this model allows staff to act nimbly as various opportunities or funding needs arise.

Mr. Mindell suggested that staff might try constructing some proposed allocation options that target a specified level of risk rather than maximizing returns by taking active risk in half, targeting a standard deviation of 6%. Ms. Kassam responded that staff and AHIC would develop some allocations using this methodology, as well as all of the other feedback received from the Board and IAC and report back at the next working session.

Mr. Alley commented that it may be necessary to adjust the 8% actuarial return to be more realistic considering the achievable returns over the next 10 years. He further asserted that it may be necessary to look into other options to achieve a higher funded ratio, such as legislative funding changes and reduction of benefits paid. Mr. Tull responded that ERS' primary control is on the investment side. Staff will continue to invest prudently to a risk tolerance with which the board is comfortable, take advantage of as many asset classes and opportunities as possible within policy limits.

Mr. Tull finished by thanking the Board and IAC for their insight and dialogue. He outlined the process moving forward, explaining that the next meeting will have an educational presentation on the experience study from the actuarial perspective, as well as more discussion from the investment perspective after staff has had the opportunity to process and incorporate the dialogue from the existing session.

Chairman Hester asked one last question regarding the time allotted to the Asset Allocation and Liability study, inquiring as to whether it could be finished sooner than scheduled. Mr. Tull responded that the most important consideration is that the Board is comfortable with the process and results. He emphasized the importance of these decisions and affirmed that the necessary amount of time will be given to the process. Mr. Tull communicated that is possible that all the time allotted will not be needed but reiterated that the Board needs to be comfortable with their decisions first.

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

Exhibit A – Updated Capital Market Assumptions

		Polic	3/31/2016		12/31/201	
		Weight	Return	Ris	Return	Risk
Return Seeking Assets:		79%				
Global		55				
	public	45	7.2%	18.5	7.3%	18.5%
	private	10	9.3%	24.5	9.3%	24.5%
Global Credit		10				
	High Yield	10	6.1%	12.0	4.7%	12.0%
	private	0%	5.5%	9.5%	6.5%	9.0%
Real Assets		14				
	real estate*	10	7.5%	15.0	7.5%	15.0%
	Infrastructure*	4%	7.0%	12.0	7.0%	12.0%
Risk Reduction Assets:		21%				
Absolute		5%				
	Absolute Return Portfolio*	5%	5.0%	3.6%	5.0%	3.6%
Rates		15				
	Intermediate Treasuries	15	1.6%	2.0%	2.6%	3.0%
Cash		1%				
	Cas	1%	1.5%	1.0%	2.4%	1.0%
Inflation*			2.5%		2.5%	
Estimated Return (Nominal)			6.8%		6.9%	
Estimated Risk			12.0		12.0%	
Sharpe			0.44		0.37	

*Custom assumption of ERS Staff and AHIC

Exhibit B – Proposed Allocation Mixes

Asset Class	Current	Risk Reducing	Enhanced Return	Diversified
Global Equity	45.0%	40.0%	42.0%	40.0%
Private Equity	10.0%	10.0%	13.0%	12.0%
Global Credit*	10.0%	10.0%	12.0%	5.0%
Real Estate	10.0%	10.0%	10.0%	11.0%
Infrastructure	4.0%	4.0%	6.0%	6.0%
Opportunistic/Private Credit**	--	5.0%	--	7.0%
Return-Seeking Assets	**79.0%**	**79.0%**	**83.0%**	**81.0%**
Rates	15.0%	15.0%	11.0%	13.0%
Absolute Return	5.0%	5.0%	5.0%	5.0%
Cash	1.0%	1.0%	1.0%	1.0%
Risk-Reducing Assets	**21.0%**	**21.0%**	**17.0%**	**19.0%**
Expected Return	**6.9%**	**6.8%**	**7.1%**	**7.0%**
Expected Risk	**12.0%**	**11.2%**	**12.2%**	**11.5%**
Sharpe Ratio	**0.374**	**0.392**	**0.385**	**0.398**

VII. REVIEW AND DISCUSSION OF THE INVESTMENT ADVISORY COMMITTEE

a. Eligibility and Compliance for Calendar Year 2016 of the IAC

Mr. Tom Tull, Chief Investment Officer, presented the eligibility and compliance for Calendar Year 2016 of the Investment Advisory Committee (IAC).

Texas government code prescribes requirements for IAC members' eligibility and an annual eligibility review. Mr. Tull emphasized that it is imperative to ensure there are no conflicts of interest and that members attend at least half of the scheduled meetings throughout the year.

Mr. Tull then presented the investment experience, IAC tenure, and asset class expertise of the current IAC members (Exhibit A). ERS staff is continuing to build IAC involvement, and has reached out to members in order to help complement staff expertise, specifically in the areas of derivatives, alternatives, and infrastructure.

Mr. Tull finished by noting that staff had confirmed that all IAC members have affirmed their eligibility pursuant to the ERS investment policy.

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

Exhibit A

	Investment Experience	IAC Tenure	Asset Class Expertise
IAC Chair James Hille, CFA, CAIA	26 years	(2011) 5 yrs.	Global Equity, Fixed Income, Private Equity, Real Estate, Hedge Funds
IAC Vice-Chair Caroline Cooley	33 years	(2013) 3 yrs.	Hedge Funds, Derivatives
Bob Alley, CFA	42 years	(1999) 17 yrs.	Fixed Income
Ken Mindell	37 years	(2006) 10 yrs.	Global Equity, Fixed Income, Private Equity, Real Estate, Hedge Funds
Dr. Laura Starks	29 years	(1990) 26 yrs.	Global Equity, Fixed Income, Private Equity, Real Estate, Hedge Funds
Lenore Sullivan	37 years	(2010) 6 yrs.	Real Estate

b. IAC Self Evaluation Report

Ms. Sharmila Kassam, Deputy Chief Investment Officer, presented the IAC Self Evaluation Report.

The evaluation is part of a continued effort to follow industry best practices concerning governance. IAC members were asked to complete a survey in order to evaluate the IAC as a whole, and themselves as individual members. The purpose of the evaluation was to allow IAC members to provide critical feedback and highlight any areas of concern.

In general, the IAC's understanding of ERS' mission and goals received the highest rating, while quantity of IAC meetings and effectiveness of IAC performance assessments received the lowest relative ratings. IAC members rated their understanding of the ERS investment program and relative duties and requirement very highly, both as a group and as individuals. IAC members also rated very highly their effectiveness at advising the Board of Trustees (Board) with respect to both strategy and program implementation. Staff agrees and has been able to leverage the expertise and effectiveness of the IAC while moving into new strategies and asset classes.

Additionally, the IAC had high ratings for their individual efforts to be competent and engaged in advising staff and the Board . They report that they review materials in advance and try to be educated on asset classes outside their areas of expertise. They attend meetings, listen, and contribute. Ms. Kassam noted that this engagement could be evidenced by the robust discussions at this and previous meetings.

IAC members responded that they are comfortable objecting to positions of various stakeholders and that they adhere to ERS policies and procedures. This includes their fiduciary duty to avoid any conflicts of interest and disclose any that do arise.

Ms. Kassam reported that IAC members felt resources provided to them were timely and sufficient. One area the IAC rated lower relative to other questions was in the effectiveness of the assessments of their performance. Ms. Kassam noted that over the years, she had multiple conversations with IAC members who indicated they are unsure whether they are satisfying the Board's requirements of them. This self-assessment, coupled with the Board's assessment of the IAC was administered as part of the effort to provide this feedback to the IAC.

Ms. Kassam finished by reviewing the results of the survey and noted that staff will continue to conduct this survey and refine the engagement of the IAC from survey results.

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

c. Board of Trustees Survey of the IAC

Mr. Tom Tull, Chief Investment Officer, presented the Board of Trustees Survey of the IAC. Board members all competed an evaluation of the IAC by completing a survey. Similar to the IAC self-evaluation, the Board gave high ratings to the IAC's understanding of ERS' mission and goals, as well as an awareness of risk and reward factors. Although the Board's lowest relative rating was given to the preparedness, understanding, and engagement, it was still rated highly on an absolute scale, indicating no dissatisfaction on this point.

Along with the quantitative ratings, Board members were presented with qualitative questions as well. Board members said they find the IAC helpful at Joint Meetings of the Board and IAC, and a variety of other informal situations including informal conversations, internal investment committee meetings, and as resources to staff. Board members also suggested additional opportunities to work with the IAC including adding a joint committee report.

As to where additional IAC expertise would be preferred, Mr. Tull reported that the Board responded in the utilization of derivatives and infrastructure investments. The Board also asked that less lingo and jargon be used at meetings by the IAC whenever possible.

Regarding how the IAC can be most useful to the Board as the asset allocation study is conducted, Board members responded that they need the IAC's full engagement, best thinking, and input on the reasonableness of expected returns and the appropriate asset allocation/risk-return trade-off to achieve competitive returns and keep the Trust actuarially sound.

Ms. Cydney Donnell, Board member, encouraged members of the IAC to reach out to the Board at any time to discuss any issues or concerns that arise. She emphasized the Board's availability both for formal public discussions as well as individual conversations outside the public forum.

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

VIII. <u>REVIEW AND DISCUSSION OF THE INVESTMENT PERFORMANCE FOR FOURTH CALENDAR QUARTER OF 2016</u>

Ms. Sharmila Kassam, Deputy Chief Investment Officer at ERS, and Steve Voss and Mike McCormick, consultants at AHIC, presented the review and discussion of the investment performance for the fourth calendar quarter of 2016.

Ms. Kassam began by noting that staff seeks to be as clear as possible when presenting. This includes efforts to define any lingo or jargon used and educate on any concepts that arise. She encouraged the Board to stop the presentation at any time if further clarification is necessary, and noted that feedback is welcome as staff continues to work towards improving reporting standards according to the Audit Committee's report.

Mr. Voss also spoke to the weight of the audit report and encouraged the Board to stop and seek further explanation whenever necessary. He mentioned that the reporting format continues to evolve over time, and requested Board input on any aspects that can be added to improve the report.

Mr. Voss gave a brief performance snapshot of the Trust fund as of December 31, 2016. The

performance for the total fund for the calendar year to date was 6.3%, underperforming the benchmark by (-110) bps. He noted that calendar year 2016 was a very difficult period for active equity managers and that he had seen it reported that the indices had beaten 80% to 85% of active managers. Mr. Voss continued that the market value of the Trust was $25.6 billion and emphasized that over 103,000 annuitants rely on these assets.

Mr. Voss highlighted the importance of compliance with respect to asset allocation, tracking error, and other statements of investment policy, and noted ERS' compliance with each. Regarding allocation, 77% of the Trust is invested in return seeking assets, and this mix between return seeking and risk reducing assets is the focus of the asset liability study happening throughout the rest of the year.

Regarding liquidity, Mr. Voss indicated that the Trust is highly liquid in efficient markets, with 73% of assets liquid versus 27% illiquid. He mentioned that later in the presentation, the AHIC team would be showing some stress tests of liquidity based upon contribution levels and benefit payments out, as well as illustrations of liquidity under unfavorable market environments.

Mr. Voss presented an overview of the Trust assets. He began with a reconciliation of market value. The trust began the period at $24.9 billion and ended at $25.6 billion, a gain of $1.6 billion in investments (6.3% as noted earlier).

Mr. Voss reminded the Board that the long-term policy allocation represents the asset mix that they decided upon at the previous asset liability study. As of December 31, 2016, the asset allocation of the Trust is very close to the long-term policy allocation. One variance comes from the infrastructure asset class, which was at approximately 1.7% of the trust compared to a policy target of 4%. Global credit was also slightly below the policy target at 8.5% vs 10.0%. Still, both are in compliance with asset allocation targets.

Mr. Voss also reminded the Board that the benchmark for the overall Trust is a mix between 79% global equities and 21% intermediate fixed income, representing the long-term policy allocations between return seeking and risk reducing assets. Over the five-year period, the Trust has performed very closely to this benchmark. Over the one-year period, the trust underperformed the benchmark by (-110) basis points (6.3% versus 7.4%). The attribution of this underperformance was almost entirely to global public equity.

Mr. Craig Hester, Board Chairman, asked a question regarding active versus passive management and whether Mr. Voss sees value in active management moving forward considering the recent trend of funds flowing towards passive management. Mr. Voss responded that active management is a difficult endeavor and that there have been numerous studies, including AHIC's own, that show average active managers tend to underperform the broader market by the amount of fees and costs. That being said, value can be added by managers who are willing to accept more active risk and diversify assets in an intelligent way, without diversifying away all alpha opportunities.

Mr. Voss further noted that ERS' internal team is its most significant competitive advantage and is utilized in the most efficient and effective way to deliver a base of market beta plus incremental returns. This team, along with external advisors who are able to target areas more difficult to transact internally or that require different skill sets, is a very sensible approach. Ms. Kassam added that staff is very conscious of fees associated with external advisors and will discuss this issue in more detail later in the meeting agenda.

Mr. Ken Mindell, IAC member, asked whether there was more opportunity for active managers to add value in less efficient markets. Mr. Voss responded that this is the case and noted various examples of less efficient markets with more alpha. He also noted that markets are dynamic, and the efficiency of markets, and thus alpha opportunities, change over time.

Ms. Jeanie Wyatt, Board member, asked whether staff prepares a comparison of the performance of internally and externally managed funds on an ongoing basis. Mr. Voss explained that there are

detailed performance reports for each of the internal portfolios and external advisors in the AHIC report. Mr. McCormick noted that those are individual portfolio reports, and neither internal nor external performance is reported in the aggregate. Ms. Kassam noted that staff will also take this suggestion into consideration as well.

Ms. Cydney Donnell, Board member, asked whether the equity underperformance was magnified after the election. Mr. Voss deferred to Mr. John Streun, Director of Global Equities, whoconfirmed this to be true. Mr. Voss added that this was not surprising, as he had seen similar results in other client portfolios as well.

Mr. McCormick delivered the presentation on risk and volatility. He reminded the Board that risk can be evaluated in a number of ways. The first way to consider risk is relative to the associated benchmark. Relative to the total fund policy benchmark, the total fund achieved a higher return at a lower level of volatility over the previous 10 year period and roughly the same return at a lower level of volatility over the previous five years. Mr. McCormick summarized these results as achieving the desired result at a lower level of risk.

Risk can also be viewed from the perspective of diversification. Mr. McCormick presented an illustration that showed the return and volatility of the policy benchmark if you remove all asset classes except for public equities and nominal bonds. Without the diversification of hedge funds, private equity, private real estate, and others, the benchmark achieves a similar return at a materially higher level of volatility. This demonstrates the benefit of diversifying into additional asset classes over the five and ten year periods.

Mr. McCormick continued with an illustration that showed total fund returns in excess (or short) of the benchmark for the previous 40 quarters. He highlighted that 2016 had some particularly difficult quarters. To emphasize this point, he presented the historical tracking error and information ratio for the total fund. He reminded the board that tracking error is the deviation between the fund itself and the policy benchmark, whereas the information ratio represents the manager's ability to generate excess returns from that deviation. In the past, there have been periods when the fund has had a very high information ratio, but recently, this has been more challenging.

Mr. McCormick presented the evolution of the total fund asset allocation, as well as historical returns relative to total fund and long term benchmarks. Over the long-term periods, the fund has consistently outperformed the benchmarks, while the short-term periods have experienced more volatility with respect to excess returns.

Mr. McCormick presented the rolling 12-month return of the various asset classes relative to their benchmark constituents. For global equities, both domestic and international, returns were very close to the mean. For high-yield, returns were an outlier and came in significantly above the mean. Private real estate returned over 9%, but still came in under the mean return. Public real estate and intermediate treasuries also came in under the mean. Hedge funds returned 5.4% at only 2.6% volatility since inception in September 2012, which is a very strong nominal return, given that short-term interest rates were very low.

Regarding methods of increasing the success of active management, Mr. McCormick presented an analysis of opportunities to capture alpha. These opportunities come largely from manager's willingness to deviate further from the benchmark. Managers who build their portfolio closely to the index tend to underperform that index by the amount of their fees and costs. AHIC recommends that more active-risk be implemented by combining low-cost beta exposure, which ERS captures well with internally managed portfolios, and high active-risk, high-conviction mandates with third party managers. Mr. McCormick noted that as more funds move towards passive management, more opportunities open for active management to create price discovery and achieve alpha.

Mr. McCormick presented the risk-adjusted performance of the fund relative to peers. ERS has performed in line, on a risk adjusted basis, with our peer group (public funds with greater than $10 billion).

While some achieved higher returns by taking larger amounts of risk, others saw lower returns at a reduced level of risk over both the 5-year and 10-year periods. In both periods, the fund had a higher risk-adjusted return relative to the benchmark.

Ms. Kassam noted that asset classes and allocations vary among ERS' peers and are not always apples to apples comparisons. She encouraged the Board to consider this when evaluating relative performance.

Mr. Voss summarized performance for the fourth calendar quarter of 2016. The Trust ended the period with total funds of $25.6 million, $700 million in growth from investment returns. The total fund return was 6.3%. He emphasized that 2016 was a difficult year for all active management and noted that most of the underperformance relative to the benchmark was a result of active management strategies. Long-term diversification has benefited the total fund by reducing volatility and increasing returns on a net of fee basis. Regarding compliance, the total fund allocation is in line with the Board-approved policy targets.

Mr. Hester acknowledged the ongoing asset allocation study but asked whether AHIC has any recommendations of tactical or strategic changes that should be made at the current point in time. Mr. Voss answered that strategically, the fund could benefit from taking on more illiquidity in exchange for potentially increased returns. He also noted that staff has done a very nice job of increasing or decreasing allocations toward private equity and real estate when opportunities present. Private credit is an area where he would encourage more of a formal allocation. Mr. Voss recommended a decrease to traditional equities, as it will be difficult for the returns to maintain the same pace of returns as they had the previous five years. Finally, he added that the hedge fund program has delivered a consistent rate of return with a very low volatility and deserves a modestly higher allocation.

Mr. Jim Hille, IAC chair, commented that recently, he had seen markets change much more quickly than they previously had been. The large run in the U.S. equity market might have given a false sense of security and encouraged complacency. But as interest rates and volatility are expected to rise, staff needs to have the ability and be prepared to act quickly and take advantage of any opportunities that present themselves.

Mr. Tom Tull acknowledged Mr. Hille's comments and noted that staff had taken advantage of high yield, as well as locked in profits from the rise in equity since the U.S. Presidential election.

Mr. Hille mentioned that with regards to private credit, it is important to consider liquidity. Further, he noted that many peers have already opened mandates for the asset class and that the opportunity may not persist for much longer. Mr. Leighton Shantz, ERS director of fixed income, added that staff currently had $275 million in commitments to private credit within the Credit portfolio of the Fixed Income program.

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

IX. REVIEW, DISCUSSION AND CONSIDERATION OF THE GLOBAL PUBLIC EQUITY PROGRAM

a. Market Update and Program Overview

Mr. John Streun, ERS Director of Global Public Equities, Chris Tocci, ERS Deputy Director of Global Public Equities, Tim Reynolds, ERS Supervising Portfolio Manager, and Neil Henze, ERS Chief Equity Trader, presented the review, discussion and consideration of the Global Public Equity Program: market update and program overview.

Mr. Streun introduced the global public equity program. He began with a general overview of the program, noting that the investment objective is to outperform the global equity benchmark, which is the MSCI All Country World Index. This is a global benchmark, and staff aims to outperform over the longer-term time periods. This is achieved through a combination of low-cost, low tracking-error, internal portfolios and higher active share, externally managed portfolios with a goal of an excess return ratio (excess return/tracking error) of 25 basis points or better. 2016 was a challenging year for active management, yet despite these challenges, the fund is only short of the benchmark by 5 basis points over the five year period.

Mr. Streun highlighted updates to the internal global public equities team. Mr. Darrell Jackson, a longtime member of the team responsible for co-managing the large-cap, active portfolio, had retired, and Mr. Kelley Hewell, who co-managed with Mr. Jackson, is now the sole manager of that portfolio. Also, global public equities' staff continues to work more closely with Ms. Sharmila Kassam and the external advisor team. Their offices are located in the same area, and the two groups are in constant conversation on how to make the program better. Finally, Mr. Jake Tisinger joined the technology team after previously working with a technology focused hedge fund in New York.

Regarding the environment for active management in CY 2016, Mr. Streun presented the Standard & Poor's (S&P) active managers score card, which showed that 90% of domestic portfolios underperformed the S&P benchmarks over the last year. To further illustrate these challenges, he highlighted that, over the previous 5-year period, only two percent of small cap managers were able to outperform the S&P 600 small cap index.

Mr. Streun presented multiple factors that led to this difficult active management environment. He first highlighted two large geopolitical events: Brexit and the U.S. presidential election. After the election, in particular, the cyclical trade took off. Internally, staff was not positioned for the result of the election or the market's reaction to that result. November and December were particularly challenging, but January and February have shown a reversal. Still, Mr. Streun emphasized that these macro events were detrimental to managers who follow any type of trend, momentum, or relative strength strategy.

Another factor that hurt active managers, including ERS, was a change in how particular sectors performed. Each year from 2011 to 2015, healthcare outperformed the overall benchmark, while energy underperformed. In 2016, the performance of these sectors flipped, and many active managers were anchored to the recent past and didn't adjust their portfolios.

Mr. Ken Mindell, IAC member, added that in addition to these sectors flipping from 2015 to 2016, many sectors also flipped in the middle of 2016. So sectors that were doing well during the first half of the year became underperformers in the second half. Mr. Streun responded affirmatively, and highlighted the financial sector, which suffered with fears of deflation during the first half of the year but surged with the reflation trade in the second half, particularly in November and December.

An additional challenge facing active management was that very small, low-quality stocks outperformed their larger, higher-quality counterparts. While it was a great year for the overall small cap benchmark, drilling down by size shows that the smallest of the small cap outperformed. For reasons of liquidity, a lack of sell-side research, and various other concerns, most active managers, including ERS, do not invest in firms of that size. Further, in 2016, the more profitable a firm was, as measured by return on equity, the worse its stock performed.

One last factor that led to the difficult active management environment highlighted by Mr. Streun was cash drag. Active managers carry cash as a percentage of the portfolio in order to transact, meet redemptions, and a variety of other reasons. Prior to the U.S. presidential election, managers increased their cash levels, and in a rising market, especially one that rose so strongly, this led to underperformance.

Mr. Streun noted that active versus passive management performance is cyclical and reminded the Board that active management tends to do better after periods of underperformance. He further stated

that active managers will do better if the market trends away from being as macro-driven and fed-induced as it was in the last year.

Mr. Streun presented the adjustments and improvements staff is making in response to this difficult year. They have reduced risk within certain portfolios and selectively moved closer to the benchmark in certain sectors where it is more difficult to differentiate winners from losers. This allows staff to concentrate research efforts on sectors with greater opportunities to differentiate.

Additionally, staff has integrated quantitative scores developed by the risk management team into their fundamental analysis and developed a systematic approach to selling in order to assist with selling discipline. Performance was hurt in 2016 by holding underperformers for too long. Finally, the team has changed analyst coverage on certain portfolios, bringing a fresh perspective to certain sectors and reducing the size of teams to be more manageable for portfolio managers.

Mr. Tocci gave an overview of the portfolio structure and positioning. This includes the dollar allocation, risk allocation, relative sector weights, regional exposures, factor exposures, and risk monitoring.

Global public equities finished the year at approximately $11.9 billion, 46.5% of the total Fund. One new internal quantitative portfolio was added and one mandate was restructured from large cap U.S. to international small cap in 2016. Regarding cash flow, $810 million came out of public equities to fund pension payments, and the portfolio finished the year at 53% domestic, 47% international. This is considered 200 basis points overweight in the U.S., and staff expects the split in the benchmark and the internal program to be 50/50 over the longer term.

Mr. Tocci presented the domestic dollar and risk allocation amongst the various portfolios (see Exhibit A), as well as the international dollar and risk allocation amongst the various portfolios (see Exhibit B). Both the domestic and international dollar allocations are well diversified. The domestic equity program is approximately $6.2 billion and the international equity program is approximately $5.7 billion.

Mr. Craig Hester, Board Chairman, asked about the allocation with regards to internally versus externally managed funds. Mr. Tocci responded that for domestic, approximately 70% are managed internally (30% externally) and for international, approximately 60% are managed internally (40% externally).

Concerning structure, the program is invested in 11 sectors. Historically, it has only been 10, but in September 2016, real estate was broken out from the rest of the financial sector. The program is still overweight in healthcare, but a significant amount of capital has been taken out of healthcare to fund a growing overweight in information technology. Energy has been performing well over the last couple years, and the program has moved from an underweight to a small overweight in that sector, driven largely by external advisors increasing their weight in that sector.

Regarding regional weights, the program moved from a slight underweight in U.S. to a hundred basis points overweight in 2016. Most of that capital was taken from Europe and the U.K. There was an extensive underweight of Japan and Asia. This underweight remains but was lessened over the course of 2016, for Japan in particular.

Mr. Tocci presented factor tilts (see Exhibit C), which he explained are measures of over or underweights to particular styles of investing. For value, that means whether the portfolio is invested in cheap or expensive stocks. For momentum, that has to do with exposure to firms with positive or negative price momentum. For volatility, it measures whether the portfolio has more or less volatility than the underlying benchmark. Mr. Tocci noted that the program was underexposed to leverage and value, two factors that performed very well in 2016, and overexposed to growth, size, and momentum, factors that have historically performed well yet failed to do so in 2016.

Looking at internal risk management, portfolio risk is monitored on a daily basis for any changes to

risk. There is an automated report that goes to internal audit, referencing policy guidelines and internally set targets for tracking error.

As examples, Mr. Tocci presented the global equities program and internal small cap charts. Global equities had a target tracking error of 150 basis points, yet over the course of the year, tracking error for this program reached a maximum of 100. Internal small cap, a very actively-managed, internal portfolio, has a target tracking error of 250 basis points. Throughout the year, it never exceeded 240. Observed results were slightly different, but these results illustrate that risk is monitored very diligently.

Mr. Streun presented the major themes and outlook for 2017. He noted that one theme that has recently been helpful is an overweight to U.S. small cap. Small cap investments have been cheaper than large cap, and going forward, expected changes to corporate tax policy will benefit small cap companies, who typically have higher effective tax rates than large cap. Additionally, if the U.S. economy outperforms the global economy, small cap companies with less international exposure will outperform relative to large multinationals or mega caps.

Another theme is an overweight to health care. Although pharmaceuticals and healthcare have come down, innovation continues to happen in the pharmaceutical industry. The drug pipeline continues to expand and these companies continue to create new drugs. Ultimately, this will lead to earnings growth. There are concerns of pricing pressure in pharmaceuticals, but innovation and low price to earnings should help this industry outperform.

Another sector that has been helpful to the portfolio is an overweight to financials. After the financial crisis, financials were seated with an additional layer of regulation. With the new administration, regulations are expected to be lessened and interest rates are expected to rise. Both of these factors will benefit financial firms.

One last theme is Japan. Internally, staff is moving capital to Japan. Japanese firms are beginning to focus on corporate governance and becoming more shareholder-friendly. Dividends and share buybacks are increasing, and that trend is expected to continue. Japan is a cyclical market, so firms will benefit from the expected global growth. Also, as the Japanese market is very sensitive to currency, if the yen continues to depreciate, as it has over the last six months, then Japanese earnings should increase.

Mr. Mindell asked a question regarding exposure to emerging markets. Mr. Streun responded that emerging market did perform well in 2016 after a longer period when they had struggled.

Ms. Caroline Cooley, IAC member, asked whether the portfolio is built considering sector or region first. Mr. Streun responded that staff employs a top down method, and that domestic and international are two separately managed portfolios. He noted that staff will continue to investigate whether it would be appropriate for a portion of the overall program to be invested in a single, global portfolio that considers sector first.

Mr. Tocci noted that, at the trust level, such an approach can be complicated by the different views of external advisors. Internally, staff may be overweight a sector and buying while, externally, managers may be underweight and selling. Mr. Streun added that there is also a separate bucket that can be used to compensate for differing views between internal and external management through ETFs. In past years, this has allowed staff to be more tactical.

Mr. Reynolds presented the Best Ideas program. This program was started three years ago to investigate strategies that might help ERS beat the market, that could be run cheaply in-house, and that could be done with no additional strain on existing infrastructure or resources. There are currently three portfolios in the program.

The first strategy is a Spinoff Fund, which was started May 2014. At the end of 2016, the fund had approximately $350 million in assets and delivered absolute performance of 18% for the calendar year.

The second is the Capitol Hill portfolio, which invests in the 50 stocks of companies that have the most intensive lobbying efforts. Started in September of 2014, this portfolio has $230 million in assets and returned 10% for the calendar year. The third is the Tactical Large Cap Quant portfolio. Started in May of 2016, the portfolio has approximately $200 million in assets and delivered an 11% return prorated for the full year.

Mr. Reynolds summarized that the Best Ideas total program assets are $800 million and a 14.7% return overall. He added that one other strategy had been formally proposed in 2016. It was based on a study that showed a portfolio comprised of Fortune Magazine's "Best 100 Companies to Work For" outperformed that market. Staff back-tested the strategy but found the results not robust enough to make a stand-alone portfolio.

Another strategy discussed informally was a Master Limited Partnership fund. This would tend to mostly hold energy companies. Discussions have been tabled due to a faster than expected recovery in energy stocks. Additionally, the due diligence required for such a portfolio would be fairly labor intensive.

Mr. Reynolds noted that the Best Ideas program has the capacity for one or two additional strategies, and the team is investigating international strategies. Mr. Streun reminded the Board that policy allows for up to 10% of the overall equity book be invested in the Best Ideas program and that they are currently $300 million under that limit.

Mr. Henze presented the trading update. 2016 was an active year of trading, with total commissions coming in just slightly less than the preceding two years, including the addition of the large cap tactical quant portfolio.

Regarding commission rates, in each of the last five years, ERS has been lower than its peers, which is a universe comprised by Greenwich Associates. Having low commissions saves the agency money. In 2016, commissions continue to be lower than peers and external managers.

Chairman Hester asked whether the decrease in total commissions paid could be attributed to the lower commission rates or to a combination of rates and less trading activity. Mr. Henze responded that the magnitude of the decrease suggests staying consistent rather than largely decreasing activity. He further explained that each year is unique with new and changing portfolios, even though total commission amounts has remained consistent.

Mr. Henze presented the international commission rates. For 2016, ERS was competitive with peers. There are some regions where the agency is slightly lower and others where it is slightly higher, but they are very competitive on an overall basis.

Mr. Henze introduced the trading team. He noted that there are three traders: Michael Clements, Rob Newhall, and himself. They are all very technically trained, experienced traders and use the latest and best technologies available. Still, they continuously monitor any new technology or best practices that can improve their trading in the future.

In 2016, the trading team traded 20 portfolios. The most active was the emerging markets portfolio, followed by international equities. Less active portfolios included the core index fund and the new large cap quant growth portfolio.

Chairman Hester posed a question to Mr. Reynolds regarding a Best Ideas portfolio of firms that might benefit from a lower tax rate on repatriation of foreign earnings. Mr. Reynolds responded that they had not considered this strategy as a stand-alone portfolio at this time, but that it is an interesting suggestion, especially in the context of the broader platform.

Ms. Cydney Donnell, Board member, followed up by asking how anticipated political or policy driven information could be monitored. She noted that markets are currently priced for everything that has been touted is going to happen as if it had already happened. Mr. Streun noted that many of the anticipated

changes and concerns mentioned by Ms. Donnell had been priced into the market. He responded that staff seeks to build portfolios from a bottom-up approach, according to solid, underlying fundamental analysis. Attempting to take positions based on policy is difficult to predict and unable to be back-tested.

Mr. Streun presented the goals and objectives for 2017. The first is proactively working with the hedge fund team to define additional portfolios that complement ERS' long-only strategy. One of the most successful managers in the equity book over the last five years has been Marshall Wace, who was brought to the long-only portfolio by the hedge fund team.

Additionally, staff will continue to foster the Best Ideas program with a preference for international strategies, specifically emerging market small cap. Investments in international small cap will be a focus of the external advisors program as well.

Mr. Streun noted that staff seeks to further develop the options program. Staff established the necessary infrastructure and relationships with brokers in 2016 and saw success utilizing options in the large cap active portfolio. It is a goal to continue to build out options capabilities to enhance returns and reduce risk.

Finally, Mr. Streun stated the objective is to continue to integrate and train the global public equities team. There have been recent changes to the team, including new hires and retirements, so integration is incredibly important.

Mr. Mindell asked a question regarding exposure to emerging markets. Mr. Streun responded that there is currently exposure in the large cap portfolio and that staff is actively investigating small cap opportunities as well.

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

b. Review and Discussion of Global Public Equity External Advisor Program

Ms. Sharmila Kassam, Deputy Chief Investment Officer, Lauren Honza, Portfolio Manager, and Michael McCrary, Investment Analyst, presented the review and discussion of the Global Public Equity External Advisor Program.

In the past, ERS had a smaller investment staff internally, so as that staff has grown, the program has evolved from more of a redundancy into a complement to internal management.

Regarding manager selection, Ms. Kassam noted that the program seeks managers who can provide the most active risk and the best return expectations, while still considering costs and fees. Staff also seeks to expand the opportunity set of strategies, investigating managers who are differentiated from the internal investment program.

Global Public Equities has approximately 24% of assets invested with external advisors. Internally managed funds have a cost of approximately 11 basis points. Externally managed portfolios cost an average of 40 basis points, and Ms. Kassam noted the combination of internally and externally managed funds provides a very cost effective composition to the overall portfolio.

Mr. McCrary presented the external advisor program investment process. This process is managed by the Global Public Equity External Team in coordination with the Global Public Equity Team and requires collaboration among the investment staff and by the ERS consultants. The multifaceted approach is comprised of five phases.

The first phase of the investment process is the Research Phase. Once a strategy has been identified, staff researches managers in that particular strategy. ERS sources managers through the ERS External Advisor website, evestment (the industry standard online database of investment managers),

and consultants, such as Aon Hewitt Investment Consulting (AHIC). Staff also attends conferences and one-on-one manager meetings to discover new strategies and managers.

The next phase of the investment process is the Select Phase. This phase consists of a four-step process that begins with a formalized search and ends in the placement of managers in the select pool. The select pool serves as a list of advisors that have been selected but have not yet been funded. Once those advisors are funded, they are moved to the external advisor group. Mr. McCrary noted that the Board delegated selection of firms entering the select pool to an internal investment committee (IIC).

The select pool process was adopted by the Board and IAC to be formalized in the ERS Investment Policy on February 26, 2013. The formalization of the select pool established a clearer methodology regarding selection of external advisors by staff with the assistance of the IAC through an Internal Investment Committee (IIC). The IIC includes the ERS Executive Director, Chief Investment Officer, and at least one other IAC member.

The current steps of the select phase are as follows: Staff initiates a search when there is a strategy need, staff goes through a multi-stage investment and operational due diligence process and presents recommendations to the IIC, and based on the recommendations, IIC grants approval for managers to be placed in the select pool. Investment staff then works with the Office of General Counsel on contracting with those managers, and the select pool is monitored on an ongoing basis by the team. Under the direction of the CIO, staff revisits whether the external advisors in the select pool are meeting the needs of the trust and to see if other managers need to be considered.

Ms. Kassam added that staff looks for an IAC member with the most relevant experience in the strategy to complement any IIC. Ms. Kassam noted that the search process is consistent with the procurement process for the agency overall.

The third phase in the investment process is the Implementation Phase. In coordination with the Global Public Equity Team, staff constructs an optimized portfolio consisting of both internal and external strategies. Staff seeks external strategies that complement the internal investment program. The funding decisions are based on staff recommendations and authorized by the CIO in consultation with the Executive Director, pursuant to the ERS Investment Policy.

The fourth phase in the Investment process is the monitoring phase. This phase is a continuous process with reviews occurring daily, monthly, quarterly, semiannually, and annually. Trends are reviewed daily, and portfolios are reviewed monthly. ERS staff conducts conference calls to review individual managers quarterly. Semiannually, meetings are held either at ERS or on location with the managers. Asset class peer reviews and an operational due diligence reviews are performed annually.

During the final step in the Investment Process, the External Advisor Team, in consultation with the Global Public Equity Team, reviews portfolio construction and the internal/external mix and will rebalance, if deemed appropriate.

Ms. Kassam presented the highlights of the External Advisor Program for CY2016. During the year, ERS funded a fund-of-funds strategy. In 2010, the Board selected Legato to run an all-cap domestic portfolio. Since then, Legato's understanding of the External Advisor Program has evolved and it was determined that the greatest need is for international small cap.

Staff worked with Legato to create a new mandate. With this new mandate, staff considered multiple factors. Within international small cap, managers that were too small or early on in their firm experience for staff to work with on a direct basis could prudently be monitored by Legato initially.

Another consideration, especially with a fund-to-fund strategy, is the possibility of a double layer of fees. Staff worked very closely with Legato to align interests and develop a performance fee structure. Ms. Kassam noted that it is a very competitive fee and will provide ERS the benefit of fund-of-fund operations without creating cost drag.

Mr. Craig Hester, Board Chairman, asked whether the fee was completely performance-based. Ms. Kassam responded that Legato is on a performance-based fee with a small management fee. Additionally, the underlying emerging managers have asset-based fees that have been negotiated to be very competitive.

Chairman Hester asked for clarification regarding this structure. Ms. Kassam responded that it is a fund-to-funds approach in terms of construction, but rather than a double layer of fees, Legato's portion of the fees have been tied to performance to better align their interests with the agency. Additionally, performance is evaluated net of fees, so Legato is rewarded by increasing performance for that portfolio. Chairman Hester followed up with a question regarding the number of funds currently included in the program. Ms. Kassam responded that there are currently four emerging managers.

Ms. Kassam noted that ERS is in the process of refreshing the select pool. Staff expects to have the Legacy searches from 2010 and 2011 either funded or removed from the select pool. This is part of an ongoing effort to keep the select pool updated.

Ms. Kassam also noted ongoing efforts by the External Advisor Program to continue to follow industry best practices. In that regard, the team seeks to leverage additional resources. This includes investigating the manager selection process of industry peers, as well as other asset classes within ERS. The team also works with Aon Hewitt Investment Consulting's (AHIC) manager selection and operational due diligence teams.

Ms. Kassam presented managers included in ERS' fund-of-funds program with Legato. She noted that the $150 million mandate was split equally amongst the four managers and that an indication of initial performance could be presented at the next quarterly Board meeting.

Ms. Kassam noted that staff has been working with the firm since 2010, at the start of the Emerging Manager Program. The firm was founded in 2004 and has a staff of 10 individuals. Their approach is to find managers early in the investment life cycle, where research shows is the best opportunity for alpha. They search the universe for managers and maintain a database of ratings of those managers.

Ms. Honza presented each of the five existing managers within the External Advisor Program. She noted the particularly challenging year for active management in 2016 but reiterated that the environment for active management is cyclical. The External Advisor team works diligently to review external managers and maintains confidence in their ability to outperform their respective benchmarks on a long-term basis.

Chairman Hester asked a question regarding performance in years prior to 2016. Ms. Honza responded that 2015 was also a challenging year, but that 2013 and 2014 were very positive.

Ms. Cooley asked a question regarding the placement and performance of Marshall Wace, an external manager noted earlier in the day to be part of the Global Public Equities program. Ms. Kassam responded that Marshall Wace is part of the Global Public Equities program but that there is some overlap with the Hedge Funds program and will be presented the August Board meeting during the Hedge Fund team's overview.

Ms. Honza highlighted the removal of the Barings and JP Morgan strategies and noted that staff is working with those firms to find strategies that better complement the internal investment program. The other fund-of-funds manager was also removed from the select pool. The decision to defund the other emerging manager's domestic all cap strategy and look for better alpha within their emerging manager space is in continued discussions.

Mr. Ken Mindell, IAC member, asked whether the Acadian Emerging Markets strategy remains in the select pool now that it has closed. Ms. Honza responded affirmatively and noted that the team frequently meets with and monitors Acadian for future opportunities. Mr. Mindell noted that his firm uses

Acadian for a number of strategies, and they have historically performed very well.

Ms. Jeanie Wyatt, Board member, commented that since the internal and external managers are treated as different programs and designed to be complementary, it would be preferable to be able to review their respective performance numbers in the aggregate.

Ms. Kassam presented the goals for 2017. As mentioned previously, the team seeks to refresh the select pool in terms of additional searches. Staff is in the process of adapting the manager search process to follow the newly revised agency procurement processes. To that end, staff will continue to work closely with the Executive Director and the Office of Procurement and Contract Oversight (OPCO) to find an efficient, consistent, and compliant process going forward.

Another goal is to continue the international small cap search. Staff had paused that process to align compliance with OPCO and plans to reinitiate that search, along with others, in 2017.

Another focus of the program will be on fees and negotiating favorable terms. This includes investigating and discussing performance fees versus asset-based management fees when it is prudent to do so. As opposed to performance fees set up for hedge fund strategies, staff is presenting longer type of terms with caps, based on the active risk and expected returns for each manager.

Finally, an overall goal of the External Advisors Program is continuous improvement. This includes enhancing the manager selection process, as well as looking at new investment mandates that would complement the trust. This is the main focus of the program going forward.

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

c. Proposed Revisions to the ERS Investment Policy Addendum XI – Global Public Equity Policies and Procedures and External Advisor Program Tactical Plan

Ms. Sharmila Kassam, Deputy Chief Investment Officer, Lauren Honza, Portfolio Manager, and Michael McCrary, Investment Analyst, presented the proposed revisions to the ERS investment policy addendum XI – Global Public Equity policies and procedures and External Advisor Program tactical plan.

Ms. Kassam noted that the presentation of this agenda item comes in the context of the conversation regarding additional searches. On a regular basis, staff makes recommendations to the Board and the IAC for changes to the investment policy. The Global Public Equity team had no recommended changes at the time, but staff is requesting the inclusion of a tactical plan that details the initiatives and strategies for the External Advisor Program. The plan takes a 12-month, forward-looking approach to searches and would be an addendum to the existing Global Public Equities Policies and Procedures.

Ms. Caroline Cooley, IAC vice-chair, asked a question to clarify her understanding of the proposed motion. Ms. Kassam responded that in the investment policy, the Board delegated the external advisor searches to an Internal Investment Committee (IIC). The tactical plan will highlight for the Board and IAC the type of searches performed and is a way to show which strategies are currently being considered and chosen for the select pool.

Ms. Caroline Cooley opened the floor for a motion to approve the proposed ERS Global Public Equities Tactical Plan for Fiscal Years 2017 – 2018, as presented in Exhibit B, to be Appendix A to Addendum XI: Global Public Equities Policies and Procedures.

The Investment Advisory Committee then took the following action:

MOTION made by Mr. Ken Mindell, seconded by Ms. Lenore Sullivan, and carried unanimously by

the members present to approve the proposed ERS Global Public Equities Tactical Plan for Fiscal Years 2017 – 2018, as presented in Exhibit B, to be Appendix A to Addendum XI: Global Public Equities Policies and Procedures.

The Board then took the following action:

MOTION made by Mr. Brian Ragland, seconded by Ms. Cydney Donnell, and carried by the members voting to approve the proposed ERS Global Public Equities Tactical Plan for Fiscal Years 2017 – 2018, as presented in Exhibit B, to be Appendix A to Addendum XI: Global Public Equities Policies and Procedures.

X. ANNUAL REVIEW AND DISCUSSION OF PROXY VOTING AND CORPORATE GOVERNANCE

Mr. John Streun, Director of Global Public Equities, Ms. Flavia de la Fuente, Global Public Equity Analyst, and Fassil Michael, Head of Custom Research at Institutional Shareholder Services (ISS), presented the annual review and discussion of proxy voting and corporate governance.

Ms. de la Fuente presented an overview of proxy voting and corporate governance. Staff recognizes that the right to vote proxies has economic value and exercises that right for the sole benefit of ERS. ERS proxy voting guidelines are maintained and annually updated and reviewed, with guidance from ISS.

Votes are submitted through the ISS electronic proxy voting system. Most votes are automated based on rules that staff updates annually. During 2016, 0.6 percent of all proposals were referred to ERS staff. Globally, ERS voted over 20,000 proposals in over 40 markets.

Ms. de la Fuente presented highlights from the proxy season. Management compensation was an area of interest this season, as was environmental and social governance. Diversity and Income inequality, as well as gender pay gap issues, gained momentum.

Total number of proposals was at an all-time high as a result of fewer withdrawals and lower omissions. Traditionally, proposals have been withdrawn after company engagement. Historically, people have preferred to have their issues heard and discussed internally, but recently, more are going to a final vote. Investor backing for director nominees in uncontested elections remained high at approximately 96 percent of votes cast.

Mr. Fassil Michael, Head of Custom Research at ISS, joined to further elaborate on the proxy season. He focused on five areas of interest: proxy access, board refreshment, executive compensation, environmental and social initiatives, and other governance topics.

Mr. Craig Hester, Board Chairman, asked whether staff is satisfied overall with ISS. Ms. de la Fuente responded that with the help of ISS, automation is at 99.4 percent. This gives staff the time to focus on finding good ideas for their respective portfolios. Mr. John Streun, Director of Global Public Equities, added that staff and ISS have a very good working relationship and that ISS is available and helpful to staff whenever needed.

Mr. Michael continued his presentation on the highlights from the proxy season and finished by looking at governance issues to watch in 2017. These included independent chair and oversight, majority voting proposals, recapitalization in favor of one chair-one vote, vote counting, confidential voting, and online only AGMs.

Ms. Jeanie Wyatt, Board member, asked whether staff expects proxy voting policy to change in the coming year. Ms. de la Fuente responded that the policy is updated yearly. She mentioned that policy

changes become necessary as governance environments change, and highlighted as an example the topic of overboarding, which is the issue of members serving on too many boards to serve effectively.

Mr. Ken Mindell, IAC member, asked a question regarding employee stock options, particularly increasing the option pools for employees and management. Mr. Michael responded that ISS uses a balanced score card. They look at the cost of the options programs to investors and show the value transfer from investors to employees. Mr. Streun added that ERS policy dictates that staff vote against a proposal if it is above a certain threshold from a dilution standpoint.

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

XI. REVIEW, DISCUSSION AND CONSIDERATION OF THE PRIVATE INFRASTRUCTURE PROGRAM

a. Market Update and Program Overview

Mr. Pablo de la Sierra Perez, ERS Director of Infrastructure and Natural Resources, Jay Yoder and Philip Cote, Pavilion Alternatives Group, presented the review, discussion and consideration of the Private Infrastructure Program: market update and program overview.

Mr. de la Sierra Perez presented the annual update on infrastructure. This included an update on the team, performance and the market, and objectives for the near and longer term.

Regarding the infrastructure team, Mr. Ryan Wilkinson joined ERS from Cintra, an infrastructure developer. He has significant experience in infrastructure investment analysis and will be focusing on infrastructure. Ruda Meireles also joined the team as an MBA intern out of UT. He also has significant experience in infrastructure.

In terms of the portfolio, the infrastructure program is still in the ramp-up stage. Since inception through December 31, staff added six funds and nine co-investments to the portfolio, for an aggregate of $751 million in commitments and still expects to add another $50 to 150 million for the remaining of the fiscal year.

Net asset value today is approximately $441 million, which is around 1.7% of the system's assets. The allocation target for infrastructure is 4%, and staff is in the process of building the portfolio towards that target. Due to the early stage of the program, performance numbers are not so meaningful, but they are showing 1.01 times total value to paid-in capital, 0.08 times in distributed to paid-in capital and 0.33% Internal Rate of Return (IRR).

Mr. de la Sierra Perez noted that staff expects two more commitments for this fiscal year and another four to five for fiscal year 2018. The current portfolio is well diversified geographically with nearly 30% in emerging markets. The policy objective is 50% +/- 20%, so the program is on target as it continues to grow. From a sector perspective, the portfolio is overweight energy, power, and utilities. This is reflective of the subsectors within the infrastructure market; however, staff does seek to diversify subsectors to the extent they can.

From a strategy perspective, the portfolio is slightly overweight opportunistic. Staff is targeting a non-core portfolio, but opportunistic shows more overweight than expected as a result of the reclassification of one asset that was thought to fall within the value-added bucket. Staff also seeks to add value by investing in projects with greenfield (new development) exposure.

From a fund investments to co-investment perspective, the portfolio is very well balanced, and from

a vintage perspective, the portfolio is also quite balanced, with the exception of CY 2014. Staff closed on no new investments during that year.

Mr. Craig Hester, Board Chairman, asked where staff sees the trend moving between funds versus co-investment and direct. Mr. de la Sierra Perez responded that the portfolio should sustain a balanced weighting. He mentioned that co-investments require entry into fund commitments, so in the short term, there may be an overweight to funds, but in the long term, the balanced portfolio is a good target.

Chairman Hester followed up with a question regarding the weights of opportunistic versus value-added. Mr. de la Sierra Perez responded that staff targets to build a non-core portfolio. They are targeting 25% core, 50% value-added, and 25% opportunistic. However, because some assets in the portfolio are expected to change from opportunistic to value-added but haven't yet, the opportunistic bucket still shows slightly overweight.

Chairman Hester asked what differentiates the core from opportunistic or value added. Mr. de la Sierra Perez responded that there are not always clear lines of delineation, but generally, core assets will be contracted, operating, material assets. Value-added will have capital appreciation expectations like partial greenfield projects, for example, and opportunistic will often overlap with private equity, while still not being quite there yet.

Regarding the infrastructure market, there is a clear trend of increased activity and size of commitment in infrastructure investment. In the last 12 months, two very large funds in the $15 billion range have closed, signaling a continuing of that trend.

Chairman Hester asked if there is too much money chasing investments or is too much money chasing good quality investments. Mr. de la Sierra Perez responded that while there is a lot of money in the market "chasing" deals, there is not as much on the relatively high-risk side. Mr. Tom Tull, Chief Investment Officer, added that the ticket sizes for the infrastructure investments are much larger than the other asset classes. So this trend is a function of the industry. Staff is trying to get into the good deals, but in a lot of cases, ERS does not have the check size to get into those deals yet.

Mr. de la Sierra Perez noted that while energy, infrastructure, power, and utilities are the largest sector within the infrastructure space, staff is seeing other sub-asset classes either growing or appearing, including credit and renewable energy. There has been more activity last year in midstream as a part of the infrastructure investments: telecommunication deals, including data centers, wireless infrastructure, and other subsectors. There is also a trend for some investors to accept more greenfield risk, direct investments, and co-investments.

Mr. Ken Mindell, IAC member, asked whether staff ran into a lot of competition from Master Limited Partnerships (MLPs) in midstream infrastructure. Mr. de la Sierra Perez responded that many of the opportunities that came in 2016 were from MLPs striving to raise money, and most were structured equity or preferred equity transactions.

Regarding the future of the infrastructure market, Mr. de la Sierra Perez noted that globally, there continues to be a very strong need for infrastructure investment, either to replace aging and obsolete assets or build new infrastructure. It is still a developing asset class. Standardization and market information are slowly improving. Staff expects increased fundraising activity in the coming years. The market continues to observe expected future and current performance of early vintages and see how, if at all, the private equity-style fund-investment model evolves for infrastructure. Also, the current political environment is expected to generate opportunities within the U.S. market.

Chairman Hester commented that if the opportunities aren't there, he hopes that capital is not being forced into the asset class just to get to the 4% policy target. Mr. de la Sierra Perez responded that staff has not forced themselves to follow the informal targets set. The team instead waits to pursue the right opportunities as they arise.

Mr. Doug Danzeiser, Board vice-chair, asked whether check sizes being too large are causing us to miss good deals because of required board approval. Mr. de la Sierra Perez responded that infrastructure asset checks are large, and ERS' size and subsequent governance does have an impact on the capacity to negotiate terms. However, he mentioned that although it does affect the program's ability to be more efficient, he does not believe this has caused the program to miss any deals as of yet.

Mr. Tom Tull, Chief Investment Officer, added that this is another area where under the new asset allocation, staff is giving it some thought in terms of possibly increasing the infrastructure portfolio to allow more flexibility. Mr. Tull further explained that the need for diversity within the overall infrastructure book is crucial. If the portfolio has some of these large deals or the wrong mix of assets, it could be detrimental. So staff prefers to have a diversified mix, monitor the asset allocation on an ongoing basis, and then reevaluate as necessary.

Ms. Lenore Sullivan, IAC member, asked at what return target are deals underwritten. Mr. de la Sierra Perez responded that on a gross basis, the return underwritten to for infrastructure can range depending on the type of deal. For core, it could be mid to high single digits, value-added deals can be low teens, and opportunistic should be approximately 15% and above. Mr. Jay Yoder, Managing Director at Pavilion Alternatives Group, confirmed that's probably what the managers are underwriting, but noted that Pavilion's return expectations would be slightly more modest.

Ms. Sullivan followed up with a question regarding the amount of leverage needed in the deal to get to that return. Mr. de la Sierra Perez responded that again, it really varies depending on the asset. There are assets that can be levered, and revenue drivers are what determine how much debt can be placed. It can range between 50 to 80%, depending on the asset.

Ms. Cydney Donnell, Board member, noted that infrastructure is still a new area of investment and expressed concern about exit strategies and the ability to underwrite these deals. Mr. de la Sierra Perez responded that staff assesses every deal for two options: whether we hold for the entire life of the project or we exit. If seeking to exit, there is an increasingly large amount of activity and appetite for infrastructure investments, so similar to other private investments, exits are definitely possible.

Ms. Sullivan commented that there are really two sets of investors. The core investor is a very different one, and the yields for core infrastructure investments are much lower because they're unwilling to take the development risk. She noted that in her experience, core investors usually had a much longer-term horizon and were willing to accept between 4% and 6% on levered coupons.

For this reason, Ms. Sullivan emphasized the importance of having a balance of opportunistic and value-added with core, because value-added and opportunistic investments can be sold. Also, because of the development risk, there should be a higher return, just like in a real estate transaction.

Regarding the issue of size, Ms. Sullivan noted that one way to mitigate the problem is to participate in funds. She reminded the Board that several billion dollars can be invested into a single deal, particularly one of these power deals, and it's a very limited group of investors that can put a small pool together to do that. In a larger fund, ERS can contribute a $400 or $500 million portion of that. This offsets the ability to manage fees, but it helps to diversify the risk.

Mr. de la Sierra Perez concluded the presentation with objectives for 2017. Staff will continue to pursue direct investments and co-investments and diversify the portfolio to the extent prudent and possible. Staff also seeks to pool managed capital with other investors to enhance operational flexibility.

Staff plans to execute on the Tactical Plan, as part of the efforts to meet the objective of reaching the 4% target allocation around 2020.

Ms. Jeanie Wyatt, Board member, asked a question regarding U.S. infrastructure deals coming with the new administration and whether there is a risk of overweighting domestically. Mr. de la Sierra Perez responded that the portfolio has targets of 50% emerging markets and 50% developed countries and that

staff will continue to drive towards that objective.

Ms. Sullivan asked whether natural resource investments will fall into the Infrastructure or Private Equity buckets. Mr. Tull responded that there are natural resources in both components, but the Infrastructure group was previously part of Private Equity. Now, it will be moving away from Private Equity, but both teams will still be working together in terms of looking at deals. But there are pieces of Natural Resources in each of those components.

Ms. Sullivan asked whether Private Equity will still have Natural Resources going forward. Mr. Tull responded that they'll continue to have any natural resource deals that are consistent with their investment guidelines. There will be infrastructure deals like pipelines and so on that may be more appropriate for infrastructure.

Mr. Doug Danzeiser asked how to assess the rate of return on these infrastructure deals given the current early stage of the deals and their relatively low IRR. Mr. Tull responded that as the investment develops and is producing, the IRR is expected to increase based on the money that has been contributed, and IRR also includes the amount of value at the very end of the tail in addition to the cash flow stream you're getting during the life of that investment. Putting all that together, an investment can have an IRR anywhere from single digits to double-digit rates of return. The reason that the IRR is currently so low is because the program is still in its infancy and J-curve[1], but other metrics, including those shown, are still reasonable at this stage of the portfolio.

Chairman Hester asked about performance relative to an infrastructure benchmark. Mr. de la Sierra Perez noted that there is not a generally accepted benchmark, so as per policy, CPI plus 400 bps is often used for operational, mature portfolios. Ms. Sullivan confirmed that there is no benchmark she is aware of and further explained that with this kind of asset, there is no cash flow for the first couple of years when money is going out to build and develop the project. Once it's operational, there will be a cash flow return, and when the asset is sold, ERS should receive a multiple of what was put into it.

Mr. Danzeiser asked if, at the beginning of the year, staff could create an estimate of expected return, and at the end of the year, a comparison could be made between actual results and the expectation. Mr. de la Sierra Perez responded that this would be difficult on a year-to-year basis due to long term payback periods and pro forma projections but acknowledged the issue of ambiguity in evaluating the performance within this asset class. He emphasized that staff will work with the consultants to develop best practices for performance evaluation.

Mr. Yoder joined to give a quick update on the portfolio. He reminded the Board that the infrastructure portfolio is still in the early stages. It's not a mature program, and what that means is it's very hard to analyze performance. But ERS has now committed about three-quarters of a billion dollars to 15 investments comprised of both funds and co-investments.

Emerging markets is approximately one-third of the portfolio, developed markets about two-thirds. Although energy is a large part of the allocation, it is diversified among a number of subsectors, including renewable energy, traditional power, utilities, and the midstream sector.

Mr. Phillip Cote, Associate Director at Pavilion Alternatives Group, presented facts and figures. Infrastructure has a lower return profile along with a lower expected risk than some of the other asset classes.

Ms. Sullivan noted an infrastructure return series in the presentation and asked whether that is something the Board and IAC should compare against. Mr. Cote responded that it's not ideal, but it's the best item available.

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[1] A J-Curve denotes an investment return scheme based on fees paid during the early years and returns realized during the later years of an investment, resembling the letter "J" when graphed over time.

In terms of infrastructure needs, there continues to be a huge need for infrastructure investment. Governments around the world have a lot of pressures on budgets and are not necessarily able to meet all the upkeep that's required. So there is an opportunity for private capital to fill that gap where the revenue model makes sense.

According to McKinsey, the world needs to invest 3.8% of global GDP, or $3.3 trillion, per year through 2030 for infrastructure to keep up with economic growth. Much of that is driven by demands on power grids, so electricity is the largest area where the need is expected for infrastructure investment, followed by roads and telecommunications. Data is constantly increasing, so that's a big area of opportunity as well.

Finally, Mr. Cote noted that the fundraising environment is very robust. In 2016, through the third quarter, funds raised were just below the peak previous record of 2013. But for the full year 2016, it was the largest fundraising year for infrastructure to date. There is an upward trend regarding the size of funds. Roughly 50% of the capital raised in 2016 was split among five infrastructure funds.

It's currently a bifurcated market. Larger funds are raising capital very quickly if they're on their third or fourth fund. And then at the opposite end of the spectrum, there are many smaller funds that are taking a long time to raise capital. But overall, a very robust environment for capital raising.

Mr. Yoder presented the market outlook for infrastructure. This is very similar to the outlook presented a year ago as trends continue in the same direction. One new factor is the expectation that the U.S. will continue to grow. This will be aided by the new administration's favorable stance towards private capital and infrastructure.

However, it will not happen quickly. In the U.S., infrastructure is very decentralized. By comparison, in a European country, if the federal government decides to do something, it gets done immediately. Here in the U.S., there are states and municipalities that often own these assets. Therefore, support at the federal level doesn't always immediately translate into opportunities for private capital.

Mr. Yoder presented some challenges associated with investing in infrastructure. There is no shortage of capital chasing deals, as in every asset class. Still, this has led to bidding up of core infrastructure, which is now selling at a premium price. This results in reduced expected returns going forward. It is also important to consider geopolitical risk, especially in emerging markets, and regulatory risk everywhere. Benchmarking is particularly difficult with infrastructure investments, and within the industry databases, the manager universes are notoriously problematic, due to both the definition of infrastructure and the number of funds included.

Mr. Yoder concluded by presenting recommendations for the coming year. ERS should continue to invest with or alongside top managers possessing operational expertise and a local presence. Also, it is recommended that the Infrastructure program move towards the Board-approved targets, focusing on mid-market managers that have strong competitive advantages and are able to avoid auctions for the larger assets. And finally, Pavilion recommends that the program maintain modest and realistic return objectives.

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

b. Proposed Private Infrastructure Annual Tactical Plan for Fiscal Year 2017-2018

Mr. Pablo de la Sierra Perez, Director of Infrastructure and Natural Resources, Jay Yoder and Philip Cote, Pavilion Alternatives Group, presented the proposed Private Infrastructure annual tactical plan for Fiscal Year 2017-2018.

Mr. de la Sierra Perez presented the proposed Private Infrastructure tactical plan for fiscal years 2017 – 2018. Staff is proposing a target of $250 million plus or minus 50% for this current fiscal year. This will be down from the $300 million that was proposed and approved last year for Fiscal Year 2017. For Fiscal Year 2018, staff proposes investments in another four to five deals, including co-investments and direct investments, for a total of $250 million plus or minus 50%.

Staff will continue to seek diversification within the portfolio from a sector perspective to the extent possible, seek capital aggregation platforms with other similarly-minded investors to gain scale and size, and continue to focus on co-investments and direct investments and establish key relationships.

Ms. Jeanie Wyatt, Board member, asked what the reason was for lowering the target for the current fiscal year. Mr. de la Sierra Perez responded that staff uses the total Trust's rate of growth in the tactical plan calculations, effectively lowering the target to $250 million. So it was a small change to adapt to the realities of the trust. One consideration, though, is that staff has increased the margin to 50% up or down, which provides flexibility should opportunities arise.

Ms. Cydney Donnell, Board member, asked how staff finds infrastructure investment opportunities. Mr. de la Sierra Perez responded that both ERS and Pavilion maintain large networks of industry contacts and databases, and most deals are sourced through those. Also, various infrastructure fund managers reach out on a regular basis, and staff evaluates and monitors those opportunities as well.

Board member Brian Ragland noted how he had encountered very large telecom infrastructure investments and asked how the team approaches this subsector. Mr. de la Sierra Perez responded that data usage is increasing significantly every year, so staff has seen a lot of opportunities in data centers and other data usage driven deals. The program does have some telecom investments in the portfolio, but to the extent possible, staff seeks to be technology agnostic and make investments that can mitigate technology exposure. These will be longer-term, and they will either be indifferent or easily adapt to technology changes.

IAC member Mr. Ken Mindell, asked how staff tackles the issue of investment size when infrastructure deals, including telecom, require literally multibillion dollar investments. Mr. de la Sierra Perez responded that ERS would expect to be part of a larger group. If it is a direct investment, staff would expect to be part of a consortium for large deals requiring that much capital. In a fund deal, the fund will raise additional co-investments if they fall short on capital.

Ms. Caroline Cooley, IAC member, opened the floor for a motion to approve the ERS Private Infrastructure Portfolio Annual Tactical Plan for Fiscal Year 2017 – 2018 as presented in Exhibit A to be Appendix A of the ERS Private Infrastructure Policies and Procedures.

The Investment Advisory Committee then took the following action:

> **MOTION** made by Mr. Ken Mindell, seconded by Ms. Lenore Sullivan, and carried unanimously by the members present to approve the ERS Private Infrastructure Portfolio Annual Tactical Plan for Fiscal Year 2017 – 2018 as presented in Exhibit A to be Appendix A of the ERS Private Infrastructure Policies and Procedures.

The Board then took the following action:

> **MOTION** made by Mr. Cydney Donnell, seconded by Mr. Brian Ragland, and carried by the members votingto approve the ERS Private Infrastructure Portfolio Annual Tactical Plan for Fiscal Year 2017 – 2018 as presented in Exhibit A to be Appendix A of the ERS Private Infrastructure Policies and Procedures.