



Evaluation of Investment Policies, Procedures and Practices

March 11, 2020



Table of Contents

- Executive Summary.....3
- 1. Investment Policy Statement Analysis and Compliance.....6
- 2. Asset Allocation Review.....9
 - A) Process for Determining Target Allocations.....9
 - B) Expected Risk & Return Summary.....10
 - C) Appropriateness of Selection and Valuation Methodologies of Alternative/Illiquid Assets
.....15
 - D) Consideration and Incorporation of Future Cash Flow and Liquidity Needs.....18
- 3. Review of the Appropriateness of Investment Fees and Commissions Paid.....21
- 4. Review of Governance Processes Related to Investment Activities.....28
- 5. Review of Investment Manager Selection and Monitoring Process.....42
- 6. Technical Summary.....47
- 7. Appendix A – Institutional Investors ERS Texas Considers as Peers.....54

Executive Summary

Pursuant to Section 802.109 of Texas Government Code, NEPC, LLC (NEPC) has been engaged by the Employees Retirement System of Texas, (ERS) to conduct an independent evaluation of the appropriateness, adequacy and effectiveness of ERS' investment policies, procedures and practices.

This Report covers five Evaluation Topics, broadly defined in Section 802.109 of the controlling Government Code:

- 1) An analysis of any investment policy or strategic investment plan adopted by the retirement system;
- 2) A detailed review of the retirement system's investment asset allocation;
- 3) A review of the appropriateness of investment fees and commissions;
- 4) A review of the retirement system's governance processes related to investment activities; and
- 5) A review of the retirement system's investment manager selection and monitoring process.

For each of the five Evaluation Topics, we have noted the Activities Completed, Standards for Comparison, Findings and Enhancement Recommendations ERS may wish to consider for improvement.

Overview of Activities Completed:

The ERS Texas Staff provided all documents requested for review by NEPC, in a timely fashion. NEPC also conducted two days of on-site interviews with ERS Staff supplemented with numerous follow-up emails and telephone calls to further investigate the implementation of policies and procedures.

Overview of Standards of Comparison:

To prepare this Evaluation Report, NEPC assembled a Reviewing Team that consisted of:

Sam Austin, Partner and Lead Consultant for ERS Texas
Bill Bogle, Partner and Chief Compliance Officer
Tim Bruce, Partner and Director of Portfolio Construction
John Krimmel, Partner and Public Fund Team Consultant
Kevin Lau-Hansen, Senior Operational Due Diligence Analyst
Mike Malchenko, Public Fund Senior Consulting Analyst
Tony Ferrara, Public Fund Team Consultant

NEPC drew upon the firm's more than 30 years of experience in observing institutional investors like ERS. We currently advise 376 clients, including 69 government-sponsored retirement systems ("Public Funds"). NEPC asked for a comparison review based on the experience of our most senior Public Fund Consultants, including John Krimmel who previously served as the Chief Investment Officer at two public retirement systems similar to ERS. We also received a review of our analysis by William Bogle, the NEPC Chief Compliance Officer and Head of Operational Due Diligence.

As a further standard of comparison, NEPC asked ERS for a list of peer institutional investors and ERS Staff provided a list of twenty (20) peers. NEPC examined the Investment Policy Statements and other publicly available documents as an additional source of industry prevailing practice alongside our experience with similar clients we work with directly.

Overview of Findings:

NEPC generally finds ERS' policies, procedures and practices to be appropriate, adequate and effective when compared to industry prevailing practice.

Overview of Enhancement Recommendations:

NEPC did identify several areas that ERS and its stakeholders may want to consider for improvement.

Critical Recommendation:

- 1) **ERS and the plan sponsor should develop a comprehensive plan to mitigate the consistent negative cash flow impact to the Trust** resulting from underfunding of the Actuarially Determined Contribution from the Plan Sponsor to ERS. This recommendation is central to the future health of the Retirement System and its ability to pre-fund benefits. For further detail and additional related findings, see Section 2 (B), beginning on page 9; and Section 2 (D), beginning on page 16 of this Report.

Non-Critical Recommendations:

- 2) **ERS should conduct an informal annual review of capital market assumptions** as currently required by statute. For further detail and additional related findings, see Section 1, beginning on page 6; as well as Section 2 (A), beginning on page 9.
- 3) **To the extent permitted under Texas Law, ERS should seek statutory procurement exemptions** similar to those applicable to other large public funds among the peer group to allow ERS additional operational flexibility when there is a need to quickly replace a struggling investment manager or take prompt advantage of an opportunistic investment. For additional detail and related findings, see Section 5, beginning on page 42.
- 4) **ERS should establish a more formal process of projecting and reporting on liquidity risk.** This process should be a collaboration between the Director of Fixed Income and the Risk Committee. This process should monitor liquidity risk using scenario stress testing. A well-defined process and procedure should be in place and memorialized within guideline or policy documentation. For additional detail and related findings, see Section 2 (D), beginning on page 18; as well as Section 5, beginning page 42.
- 5) **Future trade cost analyses should include fees, estimated impact and other implicit costs of trading,** as well as the current tracking of explicit commission costs. This more granular review of trade costs will require that the Trust maintain a database of time-stamped trade information that can be readily accessed by a third-party firm engaged to produce future trade cost analysis against an appropriate benchmark. A summary of the trade cost analysis should be reported to the Board at least every three years. For additional detail and related findings, see Section 3, beginning on page 21.
- 6) **ERS should review the current practice of bundling the cost of research with total trade costs.** While permissible in the current regulatory environment, a growing number of Public Funds no longer use a soft dollar program. Instead many have unbundled from the payment for research from trade execution. We acknowledge that ERS has an

understandably larger appetite for research given the Trust's larger percentage of assets under internal active management in comparison with peers. For additional detail and related findings, see Section 3, beginning on page 21.

- 7) **In its next annual review of the Investment Policy Statement (IPS), ERS should make revisions to improve clarity, efficiency and accountability** within the document. For additional detail and related findings, see Section 1, beginning on page 6; as well as Section 2 (C) beginning on page 15.
- 8) **ERS should compare Standard Operating Procedures (SOPs) across asset classes and create a standard format that is more consistent.** While some policies and procedures will necessarily be unique to each asset class, there is a wider than expected variance in detail and clarity among the asset class SOPs. For additional detail and related findings, see Section 2 (C) beginning on page 15; Section 3, beginning on page 21; as well as Section 5, beginning on page 42.

Section 1. Investment Policy Statement Analysis and Compliance

Activities Completed:

To review the IPS for the ERS, NEPC asked that the ERS Staff provide the most recent version. We also requested information on the process and the parties involved in the most recent revisions to the document. NEPC also audited Board minutes, Standard Operating Procedures, and asset class guidelines to confirm that they comply with the IPS.

Standard of Comparison:

To document that the structure of the IPS and the Plan's compliance with its IPS are consistent with prevailing practice, NEPC used a three-step evaluation process. The first step involved comparing the IPS to the recommended investment policy statements by the Government Financial Officers Association ("GFOA"), and the CFA Institute. The second step was to compare the System's IPS to the NEPC sample IPS template. This template applies NEPC's 33 years of experience in working with public fund clients on both the structuring of, and compliance with, their investment policy statements. The third step was to compare the Plan's IPS to the investment policy statements of the large, sophisticated institutional investors identified as peers by ERS¹.

Findings:

The most recent version of the IPS was approved by the ERS Board on May 22nd, 2019. The IPS was heavily revised during calendar year 2018 to streamline the document, clarify accountability, and sharpen the focus on higher level policy, organizational structure and investment beliefs. The goal was to mold the IPS into a document that clarifies the strategic purpose and provides flexibility for tactical implementation. Much of the granular detail on investment process that had been in the prior version of the IPS was moved to asset class Tactical Plans that are now reviewed by the Board on an annual basis. The revision was a collaborative effort between the Executive Director, Chief Investment Officer, Investment Staff, Office of the General Counsel, Board of Trustees and Investment Advisory Committee of ERS Texas, advised by Aon Hewitt (which was ERS' General Consultant until December 31, 2018). NEPC, which was appointed as General Consultant on January 1, 2019, reviewed and endorsed the IPS revisions prior to Board approval in May 2019.

The ERS IPS is generally consistent with the following elements recommended by GFOA, the CFA Institute and the NEPC IPS template:

- Scope, purpose, investment objectives, investment philosophy/beliefs
- Governance
- Investment guidelines
- Asset allocation, rebalancing and funding policy/procedures
- Internal controls
- Authorized intermediaries (custodians, depositories, broker/dealers, etc.)
- Risk management and objectives
- Performance standards and procedures
- Reporting and disclosure policy/procedures

As noted in our Enhancement Recommendations, there are non-critical differences between how the NEPC template and the ERS Texas document articulate performance objectives, rebalancing

¹ See Appendix A

policy, funding policy and internal controls over liquidity management.

The ERS IPS compares favorably with the investment policy statements NEPC examined from the peer group of similar investors. ERS' IPS is ahead of many of its peers in the thorough and detailed treatment of governance. In addition to clarity in definition of roles and responsibilities, the Plan's IPS also provides additional detail on processes such as proxy voting, scrutinized investments, and securities litigation.

One important difference between the ERS IPS and those of its peers is that ERS' performance objectives do not refer to achieving or exceeding the actuarial assumed rate of return in the stated performance objectives. The IPS rather states the Trust's performance objective "is to obtain overall investment returns over rolling five-year periods in excess of the adopted benchmark, and to achieve investment results commensurate to the amount of active risk (tracking error or other appropriate risk measurement metric) assumed." In reviewing the 20 Plans that ERS considers peers, we noted that 18 of these Plans are public funds with actuarial assumed rates of return. Of those 18 plans, 16 mention meeting or exceeding the actuarial assumed rate of return as one of their performance objectives.

ERS references another statement of goals on page 7 of the ERS 2019 CAFR: "The main goal of ERS' retirement programs is to fully fund the long-term costs of benefits provided by statute, through disciplined and timely accumulation of contributions and prudent investment of assets. The policy seeks to balance five principle objectives: (1) 100% payment of vested benefits; (2) contribution stability and sound financing; (3) intergenerational equity; (4) workforce parity; and quality of benefit".

Going back through ERS' Board Meeting minutes, we can see that the Plan is following the IPS in terms of pursuit of objectives, delegation of authority, decision making process, as well as the frequency and detail of monthly, quarterly, annual and other periodic reporting to the Board. As ERS' General Investment Consultant since January 1, 2019, NEPC has directly observed, that ERS is adhering to the governance and compliance guidelines set forth in the IPS.

ERS has taken the necessary steps to diversify its portfolio and put in place prudent risk controls. Under normal market conditions, the Trust should be able to sustain a commitment to the IPS policies under most likely foreseeable market environments and the investment managers should be able to maintain fidelity to their respective policies. However, it is important to note that ERS may not achieve stated objectives over significant periods of time given persistently abnormal circumstances (including, but not limited to, low or negative interest rates, persistent shortfall in plan sponsor contributions, deflation, liquidity traps, global recession, heightened barriers to trade, breakdown of financial markets, or exogenous geopolitical turmoil).

Enhancement Recommendations:

As noted in our findings, ERS has a thorough and thoughtful IPS which, in some areas, goes beyond industry prevailing practices. However, improvements should be considered in the next IPS review cycle for the sake of additional clarity, accountability and efficiency:

- 1) The Funding Policy is not directly articulated within the IPS. Instead, ERS has a separate Funding Policy document that was finalized in May of 2018. It is not uncommon among public funds of ERS' size to have a separate Funding Policy. Several large NEPC clients and the majority of the Plan's peers are choosing to articulate their funding policy in a separate document.

ERS should pursue a comprehensive review of funding policy to help ensure the retirement security of Plan participants and beneficiaries. We do note that funding for the plan is outside of the direct control of ERS. With the persistent shortfall of contributions from the State of Texas, it may be increasingly difficult to achieve return targets while maintaining a prudent level of risk.

The actuarially determined contribution is calculated each year, is determined by the System's actuary and is reported to the State of Texas. The actuarially determined contribution has not typically been contributed by the State. The Texas Constitution – in Article XVI, Section 67 (a) (i) - requires that the financing of benefits must be based on sound actuarial principals. ERS currently has a flat contribution rate by statute, which is not tied to the actuarial liabilities. ERS has adopted a funding policy that recommends changes to the amortization period from a 31-year open amortization period target to a closed amortization period, starting at 31 years. The funding policy also recommends a shorter amortization period once progress has been made on the closed 31-year period liabilities. The actuarial standards recommend Funds use a less than 30-year amortization period.

ERS cites addressing the contribution shortfall as a Major Initiative on page 8 of their 2019 CAFR. “The System will provide information consistent with its funding policy to the Texas Legislature on the status of the state employee, judicial and supplemental law enforcement and custodial officer plans. The current contribution levels are not considered sound funding and the financial status of these plans continue to decline.”

- 2) We recommend adding language that includes meeting or exceeding the Fund's actuarial assumed rate of return over the long term.
- 3) NEPC also recommends that the definition of an asset allocation study be more precise and that the timing of such studies be more flexible. In light of the unprecedented drop in interest rates and expected returns for public market asset classes, an informal review of the capital market outlook should be done on annual basis. When capital market assumptions change significantly, this may lead to what NEPC refers to as an asset allocation (or asset-only) study more frequently than every 3-5 years. On page 15, the ERS IPS states “Formal asset allocation studies will be conducted at least every four years in connection with the actuarial experience study.” NEPC would actually define the type of study described in the prior sentence as an asset-liability study as opposed to an asset allocation study. It is prevailing practice among ERS' peers to conduct an asset liability study every 3-5 years, but asset allocation studies can be more frequent.
- 4) Regarding the Plan's rebalancing process and policy, NEPC advises ERS to document the frequency of rebalancing, transaction cost considerations, and whether asset classes are to be rebalanced to mid-range or target. This documentation may either reside in the IPS or in the operating procedures for relevant asset classes.
- 5) NEPC suggests moving the current Table 3 of Chapter IV (Asset Class Allocations and Ranges) into the IPS appendix. This would facilitate the efficiency of reflecting future changes to the asset allocation, since only the appendix will need to be updated while the IPS itself remains evergreen.

- 6) NEPC has several suggestions regarding items to be reported to the Board. The CFA Institute and GFOA do mandate monitoring and reporting procedures be outlined somewhere in the IPS. The IPS should specify that performance reporting include net of investment management fee data. At least once every three years, NEPC recommends a trade cost analysis report to the Board that summarizes explicit commissions as well as implicit costs of trade execution. NEPC also recommends a comprehensive annual report on liquidity risk. This goes beyond the current language on page 22 that states “Staff prudently and actively manages liquidity within the other asset classes and specifically reports back to the Board in the case of private market asset classes in quarterly asset class reporting”.
- 7) Additionally, as part of prevailing practice for this section, the Plan may wish to consider inclusion of a “Watch” list policy and process.

Section 2. Asset Allocation Review

2(A). Process for Determining Target Allocations

Activities Completed:

To review the Investment policies and practices surrounding asset allocation and asset liability measurement, NEPC asked that the staff of ERS provide the most recent version of the asset allocation and asset liability study policies. Further, NEPC evaluated the past asset allocation recommendations and asset liability studies that were completed.

Standard of Comparison:

To ensure the Plan is following prevailing practices as it relates to the asset allocation process, NEPC used a two-step evaluation process. The first step involved comparing ERS’ policies and practices to the prevailing practice of NEPC’s clients. As part of our methodology for evaluating the reasonableness of this policy as outlined above in the Standard of Comparison section, several peer institutions were compared to ERS’ asset allocation policies.

Findings:

ERS has developed a clear process that allows for routine setting, monitoring, and review of both the asset allocation of the portfolio and the assets and liabilities of ERS. This process is consistent with prevailing practice among peer public pension funds. The importance of asset allocation is codified in ERS’ IPS as central to the investment philosophy of the ERS portfolio. Chapter II, Section A of the IPS states that the “single most important decision the Board makes is the long-term asset allocation decision. Staff are tasked with implementation though prudent and sound strategic decision”. NEPC believes this sentence provides clarity and context to Board members on the importance of this function as well as the oversight for responsibility.

More specifically, the IPS states that “formal asset allocation studies will be conducted at least every four years in connection with the actuarial experience study.” As stated previously in Section 2 (A) of this Report, NEPC would define this type of study done in conjunction with the actuarial experience study as an asset-liability study instead of an asset allocation study. The forward- looking projections for the asset liability study are prepared by the Actuary, with input provided by the General Investment Consultant on capital market expected returns, volatilities and correlations.

Both the Actuary and Consultant report their projections to ERS Staff and the ERS Board. The actuarial experience study will be conducted every four years pursuant to Texas Government Code § 815.206(c). Within each asset class, the CIO, in consultation with the Executive Director, shall adopt portfolio implementation strategies and investment styles to meet the overall investment objective of each asset class. Staff for each asset class will present to the Board at least annually an overview of their program, including the forecasted 12-month plan for the asset class as a tactical plan. The strategic allocations can be found in Chapter IV, Table 3 of the IPS.

Enhancement Recommendations:

As noted in our findings, ERS has developed a detailed asset allocation and asset liability review process. The approach is robust and sufficiently detailed to maximize effectiveness. We recommend, as noted in Section 1, adding language for an informal review of capital market outlook on an annual basis to improve flexibility for ERS to respond on the margins to rapidly changing market environment. This annual review may find cause for the Retirement System to consider minor changes to its asset mix more frequently than every four years. Frequent asset allocation changes, however, are not meant to be a tactical tool. Significant changes to the strategic asset allocation should not be made without careful consideration and are not expected to occur every year.

2(B). Expected Risk & Return Summary

Activities Completed:

NEPC reviewed the following documents.

- NEPC Asset Allocation Team process for developing expected risk and return forecasts
- ERS Investment Policy Statement
- 2019 Actuarial Valuation Report
- 2018 Funding Policy
- 2017 ALM Study
- 2015 Liquidity Study
- Hedge Fund Tactical Plan
- Private Real Estate Tactical Plan
- External Advisor Program Update
- Caledon Market Overview
- Opportunistic Credit Tactical Plan
- Private Equity Tactical Plan
- Private Infrastructure Annual Tactical Plan
- Fixed Income Program Market Update and Program Overview
- Hedge Fund Program Market Update and Program Overview
- Global Public Equity Market Update and Program Overview
- Private Equity Program Market Update and Program Overview

Standard of Comparison:

We compared the process by which ERS Texas sets and regularly assesses expected risk and return information with NEPC's experience with how similar public pension plans approach this process.

Findings:

As with most other public pension funds, ERS relies on its General Consultant to provide capital market forecasts for expected returns, volatilities and correlations among the asset classes. ERS Staff responsible for each asset class, and applicable asset class consultants, also express their own view on market outlook in their Tactical Plans, Market Updates and Program Overviews reported to the Board. The ERS Risk Management and Applied Research (“RMAR”) Team regularly reports to the Board on risk conditions present and anticipated in the markets.

NEPC’s capital market assumptions provided to ERS are developed by NEPC’s asset allocation team which consists of senior investment professionals as well as licensed actuaries. These assumptions are forward-looking and fundamentally based forecasts developed with proprietary valuation models to generate both an intermediate and long-term outlook. The long-term outlook represents a foundation on which to build a strategic allocation to meet long-term objectives. The intermediate outlook represents a planning horizon over which more dynamic asset allocation decisions can be developed.

Asset class forecasts are based on a combination of forward-looking analysis and historical data. Forecasts are produced for 22 traditional asset classes and 25 alternative strategies with both pre-tax and post-tax assumptions. Historical information dating back to 1926, which includes monthly index returns, cash rates, inflation rates, bond yields, and valuation metrics are utilized to both frame the current economic environment and serve as the foundation for the volatility and correlation assumptions for all asset classes. Volatility assumptions are based primarily on the long-term history of the asset class with some adjustments for the current environment, while correlation assumptions are based on a mix of both long-term history and current trend.

Expected return forecasts are based on current market prices and forward-looking estimates. The forward-looking estimates rely on a fundamental building blocks approach that broadly includes intermediate and long-term assumptions for economic growth, supply/demand dynamics, inflation, valuation changes, currency markets, forward-looking global yield curves, and credit spreads. The building blocks are specific to each major asset class and represent the primary drivers of future returns. For example, the equity forecast model is based upon assumptions for real earnings growth with adjustments incorporated for profit margin changes, inflation, dividend yield, and current valuations trending to long-term averages. Fixed income return forecasts are based upon changes in real interest rates and forward yield curves, with credit sectors including an assumption for changes in credit spreads and credit defaults. Alternative investment strategies are similarly built from the bottom up with a building blocks approach based upon public market beta exposures while also incorporating an appropriate risk premium for illiquidity.

The asset class assumptions are formally prepared annually but may be revised during the year should significant shifts occur within the capital markets. The review process is overseen by the Asset Allocation Committee, which includes the asset allocation team and various members of the consulting practice groups. The responsibilities of the Asset Allocation Committee include highlighting current market risks. While the formal process is earmarked for an annual cycle, NEPC regularly assesses markets and opportunities. Should return and risk expectations change, or an event take place, either domestically or abroad, that will have an impact on our clients’ portfolios, NEPC makes clients aware as soon as possible and recommend actions accordingly.

ERS 2019 capital market assumptions and expected rates of return and risk are presented for the 5-

to 7-year and 20-year periods in Illustration 2.1 below. Risk is expressed as the expected standard deviation of the asset class and the total asset mix. Risk, as shown in the table is calculated using the correlation of assets and variance-covariance matrix based on the 2019 NEPC capital market expectations.

Illustration 2.1

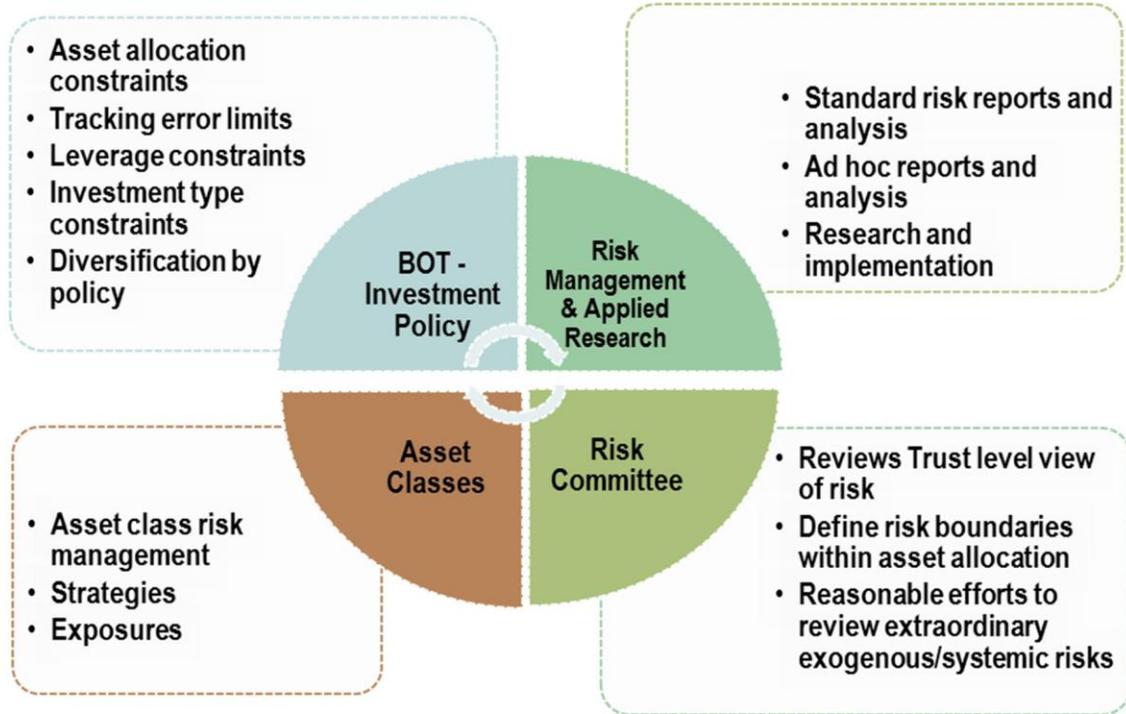
	Asset Class	Policy Asset Allocation	5-7 Yr Expected Rate of Return	Expected Risk (Std. Dev.)
Risk Seeking: 79%	Global Equity	37%	7.00%	17.60%
	Private Equity*	13%	8.80%	19.60%
	Total Global Equity*	50%	7.50%	17.80%
	Global Credit*	11%	5.50%	11.80%
	Opportunistic Credit*	3%	6.80%	8.70%
	REITs	3%	6.80%	20.00%
	Private Real Assets - Infrastructure/Land	7%	6.30%	12.00%
	Private Real Estate*	9%	6.70%	14.50%
	Real Assets*	19%	6.80%	12.30%
Risk Reduction/ Liquidity Assets: 21%	Fixed Income – Rates*	11%	2.50%	4.70%
	Absolute Return*	5%	6.50%	3.60%
	Cash	1%	2.50%	1.00%
	Expected Return (Geometric) 5 - 7 Yr		6.68%	
	Standard Deviation (Asset)		12.02%	
	Expected Return 20 Yr		7.51%	

Source: NEPC 2019 capital market expectations

The mix of assets in the above table is expected to achieve the plan’s actuarial rate of return which is currently 7.5% over the next 20 years. It is important to note that capital market expectations are subject to change from year to year based on prevailing market conditions and the myriad of inputs considered when setting forward-looking capital market expectations.

ERS manages risk at several levels of the organization. As shown in Illustration 2.2, below, important roles in monitoring and managing Trust-level risk are played by the ERS Board, the Risk Management & Applied Research (“RMAR”) Team and the Risk Committee. The Risk Committee meets at least monthly and includes the Chief Investment Officer, and the RMAR Director, along with senior Portfolio Managers responsible for each asset class. In addition, each asset class is responsible for managing risk within its portfolio. Staff monitors quantitative risk metrics and conducts stress testing analysis across differing market regimes. For example, a range of interest rate regimes, volatility regimes equity and fixed income market shocks, sub-asset class market shocks, and business cycle fluctuations are considered.

Illustration 2.2



The ERS strategic asset allocation is shown in Illustration 2.3, below.

Illustration 2.3

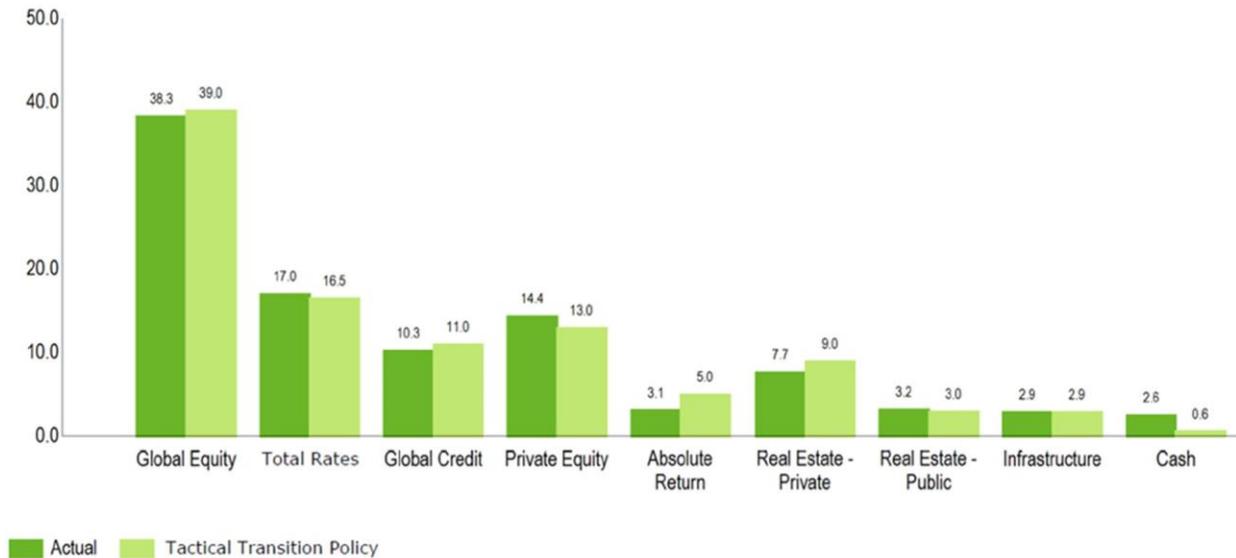
Asset Class	Long-Term Target	Min	Max
Return Seeking Assets:	83%	--	--
Global Equity	50%	--	--
Public Equity	37%	27%	47%
Private Equity	13%	8%	18%
Global Credit	11%	1%	21%
Real Assets	19%	--	--
Public Real Estate	3%	0%	13%
Private Real Estate	9%	4%	14%
Private Infrastructure	7%	2%	12%
Special Situations	0 - 5%	--	--
Opportunistic Credit	3%	0%	8%
Risk Assets: Reduction/Liquidity	17%	--	--
Fixed Income - Rates	11%	--	--
Cash (approximately)	1%	--	--
Hedge Funds/Absolute Return	5%	0%	10%
Global Total	100%	--	--

Source: ERS IPS pg. 15

The ranges outlined in the Table 2.3, above, reflect the expectation that Staff will be tactical in its implementation decisions to prudently manage risk and maximize return (per IPS pg. 15). NEPC finds that ERS gives appropriate consideration to the amount of active risk taken within portfolios. Per the IPS table that profiles 'Asset Classes, Leverage, Risk and Risk Budget' as well as the individual Asset Class Program Overviews, each asset class has well defined active risk budgets, investment objectives and investment strategies. The active risk budgets cite the benchmark, reference indices, risk controls, investment management style and expected investment manager skill as measured by Information Ratio.

As of September 30, 2019, tactical deviations from the strategic asset allocation are shown in Illustration 2.4, below.

Illustration 2.4



Source: ERS 9/30/2019 Quarterly Investment Performance Analysis Report prepared by NEPC

Enhancement Recommendations:

As expected returns for capital market assumptions are trending downward, ERS and its stakeholders should devise a comprehensive plan to address the persistent contribution shortfall. With medium- and longer-term expected returns projected to be lower for most public market asset classes when calculated in 2020, the temptation for many public pension funds will be to reach for potentially higher risk-adjusted returns in private market asset classes. Unfortunately, there may be liquidity constraints as a result of the persistent contribution shortfall that prevent ERS from significantly increasing exposure to private markets. As the Trust’s General Consultant, our recommendations regarding expected return and risk will be inputs to an asset allocation study and actuarial experience study contemplated by ERS later in 2020.

2(C). Appropriateness of Selection and Valuation Methodologies of Alternative/Illiquid Assets

Activities Completed:

NEPC reviewed the following documents.

- Investment Policy Statement
- Hedge Fund Program Guidelines
- Hedge Fund Standard Operating Procedures
- Private Equity Program Guidelines
- Private Equity Standard Operating Procedures
- Private Infrastructure Program Guidelines
- Private Infrastructure Standard Operating Procedures
- Real Estate Program Guidelines
- Real Estate Standard Operating Procedures
- ERS private market LP Agreements selected by NEPC for audit review

Standard of Comparison:

Alternative investments are defined in the Texas Government Code Sec. 815.3015 as “an investment in a private equity fund, private real estate fund, hedge fund, infrastructure fund, or another asset as defined by rule of the Board of Trustees.” Thus, to gain an understanding of how illiquid assets are selected, measured, and evaluated, all the above listed documents were reviewed.

Having studied the most recent asset allocation study for ERS, prepared by the prior consultant (Aon Hewitt), NEPC finds that the methodology for concluding that alternative investments were appropriate was sound given the Plan’s size and expertise of staff and consultants.

Findings:

As discussed in more detail in Section 4 of this Report, the IPS states that the Board has delegated authority of individual investment selection, including alternative assets, to the ERS Staff. Alternative assets are selected and evaluated by Investment Staff in conjunction with support from asset class consultants as described in the Program Guidelines and the Standard Operating Procedure documents. Selected investments are then reviewed by the respective Asset Class Investment Committee to ensure that the investment conforms to the investment objectives outlined in the Asset Class Program Guidelines and Annual Tactical Plan. The Asset Class Investment Committees generally have the authority to approve prospective investments in alternative assets up to a limit of 0.6% of the total market value of ERS’ assets as reported in the most recent ERS CAFR, pursuant to Texas Government Code Section 815.3016. The Board must approve investments above this limit.

The IPS outlines the asset classes that ERS can invest in, including the benchmarks for each asset class and the role that each asset class plays in the Trust’s portfolio. This makes it clear to the reader how to measure the performance of the asset classes according to the benchmarks and according to the role that the asset classes play in the portfolio. Program Guidelines for the asset classes also include information regarding the eligible types of investments and other attributes that should be considered when considering investments in alternative asset classes.

The IPS refers to the definition of alternative investments included in Texas Government Code as being Private Equity, Private Real Estate, Hedge Fund, and Infrastructure funds. Within the Asset Allocation chapter of the IPS, long-term target allocations along with ranges defined by a minimum and a maximum are set out for each of those asset classes. The IPS explains that “The Board has set the ranges with an expectation that Staff will be tactical in its implementation decisions in an effort to prudently manage risk and maximize the expected return given that risk.” These targets and ranges defined in the IPS are shown in Illustration 2.5, below.

Illustration 2.5

Asset Class	Long-Term Target	Min	Max
Private Equity	13%	8%	18%
Private Real Estate	9%	4%	14%
Hedge Fund	5%	0%	10%
Private Infrastructure	7%	2%	12%

Source: Employee Retirement System of Texas Investment Policy Statement, adopted May 22, 2019

The Hedge Fund, Private Equity, and Private Infrastructure SOP documents make explicit references to valuation. The Private Real Estate SOP does not mention valuation other than stating that Fund Valuations will be monitored. The Private Equity and Infrastructure SOPs contain

sections that explain that Staff on those investment teams seek to perform a reasonability check on the valuations applied to the companies and assets in the limited partnerships in which the Retirement System is invested. The SOPs state that there are generally three valuation methods: cost approach, relative value approach, and intrinsic value approach (AKA, the discounted cash-flow approach). Staff expects that most private equity companies will be valued using the relative value approach (either guideline public companies or comparable transactions) while most private infrastructure assets will be valued using the intrinsic value approach. If a valuation method applied to a company or asset is deemed to be improper or if Staff arrives at a materially different valuation, Staff will follow up with the relevant General Partners.

We note that Staff is not actually valuing the assets in the Funds, but instead conducting reasonability checks on the valuations performed by the General Partners. If assets flagged for follow-up amount to a material part of the portfolio, Staff will reach out to the General Partners and if this challenge process is unable to result in opinion of reasonable valuation for the aggregate portfolio, ERS will pursue independent valuations to the extent reasonable.

The Hedge Fund SOP states that in relation to valuation, all hedge fund investments have a third-party administrator and further review on valuation of assets is performed by the auditor of the hedge funds along with any third-party valuation experts hired by the hedge funds. The SOP further explains that ERS “relies heavily on the review of audited financial statements by Albourne.” Any issues of concern that are highlighted through that review are documented and discussed with Albourne (ERS’ Hedge Funds Consultant).

These valuation checks are typically compiled in valuation reports which are presented to an ERS Valuation Committee composed of the Asset Class Directors, the Finance Director, Investment Operations Director, and the Chief Investment Officer. The Valuation Committee reportedly meets approximately twice a year. ERS must use June 30 private markets (private equity, private infrastructure, and real estate) fund valuations since that is typically the last valuation date for those funds before the end of the Retirement System’s fiscal year on August 31. Thus, the focus of the Committee’s meetings is to review market movements between June 30 and August 31 and to determine whether markets have moved materially in a way that could impact the valuations in the private market funds. If it is determined that there was a market event that could impair the reported June 30 valuations, the ERS Valuation Committee may apply a discount to those valuations. Staff stated that since the Committee’s formation in 2017, they have not had to apply a discount.

Enhancement Recommendations:

The information noted in the findings above regarding the existence, functions, and results of the ERS Valuation Committee is mostly derived from conversations with Staff. There were no references to it in the IPS or Program Guidelines, or any significant references to it in the SOP documents outside of a reference to the preparation of a Valuation Report in a table detailing the reports prepared by the Private Equity and Infrastructure teams. NEPC recommends that the purpose, functions, membership, and possible actions of this committee be formalized.

2(D). Consideration and Incorporation of Future Cash Flow and Liquidity Needs

Actions Completed:

To assess the consideration and incorporation of future cash flow and liquidity, NEPC asked that the Staff of ERS provide the most recent version of the IPS; the 2019 actuarial valuation report conducted by the System's Actuary, Gabriel Roeder Smith & Company (GRS); the 2017 asset-liability study conducted by GRS and ERS' former General Consultant, Aon Hewitt; the 2018 funding policy; and the most recent liquidity study presented by Staff to the ERS Board in 2015.

Standard of Comparison:

ERS' asset allocation is a function of a mosaic of inputs, including but not limited to, actuarial evaluations, risk tolerance, and liquidity needs. NEPC evaluated the policies that were made available by the 20 public funds ERS considers peers, unfortunately, not all the documents needed to make a fair comparison were available. Policies around liquidity may be compared to peers and industry prevailing practice but is mainly rooted within the funding needs of the Plan.

However, we can speak to how the System is handling its future cash flow and liquidity needs versus our clients as we have a more holistic view of what is being done by them. As a result, we asked our Asset Allocation team who has the perspective of seeing what all our public fund clients are doing to address these issues and have actuarial backgrounds to speak to the processes and methodologies being used.

Findings:

As previously noted in Section 1 of this Report, the actuarially determined contribution is currently calculated based on a 31-year open amortization period, as set by statute. The actuarial standards recommend a less than 30-year amortization period, and this longer time horizon is an outlier. The funding period is calculated as the number of years required to fully amortize the unfunded actuarial accrued liability (UAAL) and is calculated with the use of an open group projection. As outlined in the valuation report presented at the December 10th, 2019 board meeting, the total contribution rate for the current fiscal year exceeds the normal cost by 5.74% of payroll, which on both an actuarial and market value of assets basis, is not enough to amortize the unfunded liability over a finite period. Based on current expectations and assumptions, ERS is expected to remain solvent until the year 2075, after which the funding would revert to a pay as you go status. This is based on the experience investigation that covered the five-year period from September 1st, 2011 through August 31st, 2016. The UAAL of ERS increased from \$11.6 billion as of August 31st, 2018 to \$11.7 billion as of August 31st, 2019. The funded ratio increased from 70.2% to 70.5% over this period.

System specific issues are incorporated by using member data, financial data, benefit and contribution provisions, and actuarial assumptions and methods. Based on the valuation report, the current funded status of the plan as of August 31st, 2019 is a funded ratio of 70.5% using the actuarial value of assets and 68.7% using the market value of assets. Based on current funded status and plan assumptions the ERS trust is projected to run out of money in ~50 years.

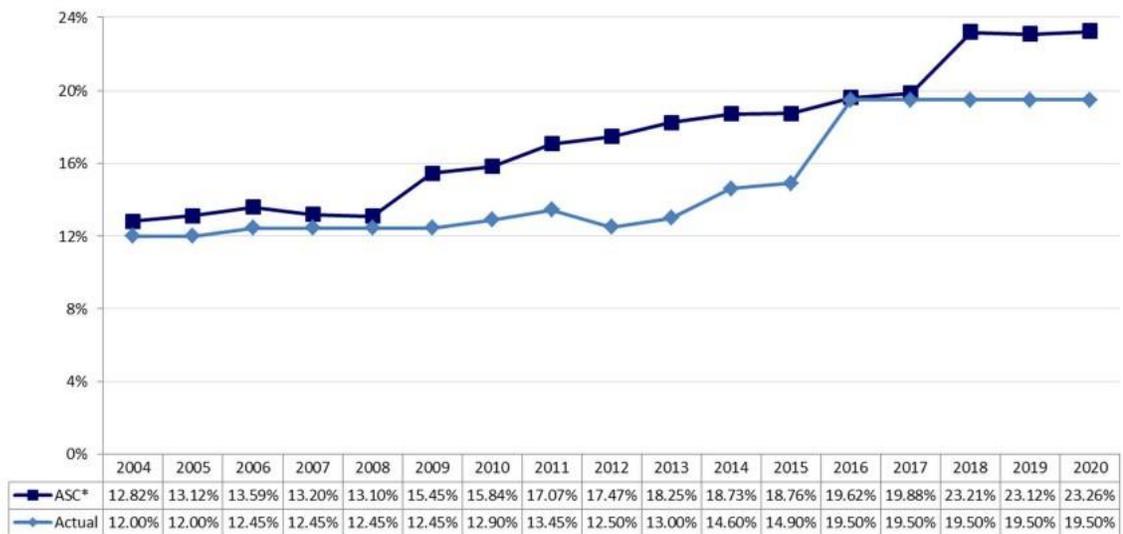
GRS estimates, based on the current asset allocation and actuarial assumptions, the System will be depleted in approximately 56 years. It is important to note that ERS actuarial assumptions include funding via a negotiated fixed contribution rate set by the legislative budgeting process. Citing page 10 of the 2019 GRS Valuation Report, negotiations have resulted in inappropriate contribution

levels. Referencing Illustrations 2.6 and 2.7 below, GRS demonstrates that historical contribution rates have lagged Actuarially Sound Contribution rates and fund depletion in the base case scenario occurs in 2056. The nature of these observations drives the liquidity requirements of the System.

Illustration 2.6

GRS Table 1: Actual vs. Actuarial Contributions

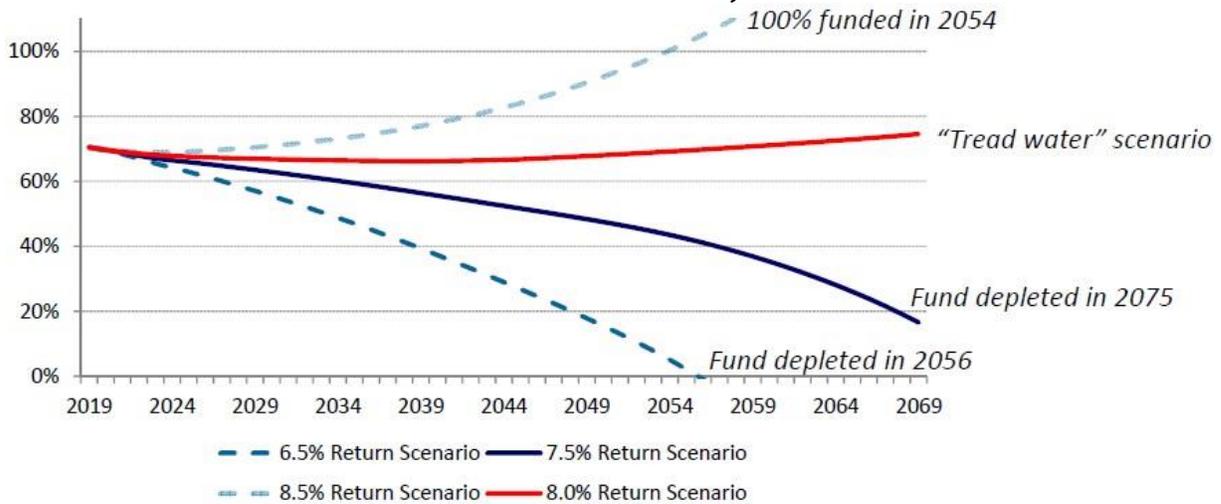
(% of Payroll, by Fiscal Year)



*Actuarially Sound Contribution defined as normal cost plus 31-year amortization of unfunded

Illustration 2.7

GRS Table 2: Funded Ratio Projections



Projections assume no changes to current assumptions and except actual asset returns, as noted, all other assumptions are met and future contributions continue at current levels.

Source: 2019 GRS Actuarial Valuation Report

The Law Enforcement and Custodial Officer Supplemental Retirement Fund (“LECOSRF”) trust is projected to run out of money in ~25 years. And the Judicial Retirement System of Texas Plan Two Fund (“JRS2”) trust is projected to run out of money in ~50 years. Further, the guidance around future contribution rates is paramount to the Plan’s survival, citing the 2019 Actuarial Report by

GRS - "The ERS, LECOSRF and JRS 2 plans are currently, and have been historically, funded on a fixed percent of payroll, as required by the constitution. With a fixed-percent-of-payroll funding structure, contribution rates received by the plan are not adjusted each year based on actuarially determined need. This structure is inconsistent with actuarial funding prevailing practices and Article XVI, Section 67(a)(1) of the Texas Constitution mandating that the financing of benefits be based on sound actuarial principles. In seeking funding during the legislative budget process, the Board directs staff to request funding based on priorities and guidelines." The changes outlined in the report suggest added contributions and increased returns along with a potential reduction of benefits as the course of action needed. Part of the gap in funding from the return side is that the actual returns have not been available in the market to meet the assumed rate of return. The valuation report suggests that an effective strategy is one that is available to provide benefit security and support the funded status. Of note some strategies can provide substantial contribution rate volatility. To counter that, the valuation report highlights there are some rate stabilization techniques used in the industry to provide relief. One example is the City of Houston policy from the 2017 legislative session and the floating rate approaches used by the states of Utah and South Carolina. From the May 23rd, 2018 pension funding priorities and guidelines board approved document, the policy laid out a multi-level funding period goal to gradually achieve funding based on sound actuarial principles. (1) avoid trust fund depletion; (2) meet current statutory standard of a 31-year funding period; (3) match funding period to the average years of service at retirement once a 31-year funding period is achieved and closed. The actuarial report based on their outlook recommends the Legislature increase the contribution rate to ERS. As noted in Section A of the report, "Each successive biennium that ERS receives the currently scheduled contribution rates, the UAAL is projected to increase by approximately \$1 billion and the ASC is projected to increase by approximately 0.20% of payroll resulting strictly from a deficiency in contributions."

The Asset-Liability Study (ALM) study done on July 10th, 2017 used asset allocation scenarios for realized returns, stressed market periods using seven different stress periods, and stochastic analysis was done to estimate economic cost. From the stochastic analysis it was noted that under the previous policy over a 30-year time horizon the expected economic cost is \$30.962B and the potential risk is \$44.480B. Additionally, a liquidity study was performed to assess the liquidity of the portfolio in a base case, blue sky, recession, and black sky scenario (with the latter two scenarios being considered stress tests). The stress tests are designed to aid in the evaluation of an asset mix against the Retirement System's ability to pay benefits and expenses while maintaining that asset mix. AON concluded that in the direst scenario the plan would have 37% in liquid assets; an amount enough to pay benefits and expenses. From the July 10th, 2017 ALM study a modification to the proposed investment policy was recommended to increase the funded status of the plan. While this improves conditions, it does not fully address the funded status challenges. As noted above that was reflected in the valuation report, which suggested a need for added contributions.

NEPC was not able to locate a 2018 or 2019 version of a liquidity study. Nor were we able to locate any workbooks or liquidity monitoring worksheets. That said, we believe the plan has ample liquidity to meet the funding requirements of the Plan. But even with these reports not being published or reported recently, the four major liquidity threats to the Fund are:

- 1) not receiving the actuarially required contributions for an extended period time,
- 2) the low, but non-zero, probability of negative interest rates through the intermediate portion of the Treasury curve,
- 3) accelerated capital calls in an extended market downturn, and

4) a reach for significantly higher than current exposure to private market investments to achieve unrealistically high return targets

Enhancement Recommendations:

The Plan and its stakeholders must find a sustainable way to address the overriding issue and biggest risk to the System becoming insolvent: a \$1.2 billion annual cash flow shortfall.

This shortfall arises primarily because of persistent underfunding of the Annual Required Contribution from the Plan Sponsor. It is not primarily an issue of investment return.

Additionally, the Retirement System should consider a central resource to manage liquidity risk. We suggest this process be managed by a collaboration of the Director of Fixed Income and the Risk Committee. The process should monitor liquidity risk in light of scenario stress tests and report to the IAC and Board on at least an annual basis on the matter. As noted in our Section 1 Enhancement Recommendations, a well-defined process and procedure should be in place and memorialized within guideline or policy documentation.

Section 3. Review of the Appropriateness of Fees and Commissions Paid

Activities Completed:

NEPC reviewed the following documents.

- Investment Policy Statement
- Investment Operations Standard Operating Procedures:
 - Externally Advised Manager Fees
 - Private Markets Management Fee Reconciliation
- ERS Office of General Counsel: Procedures Related to Private Fund Investments
- Comprehensive Annual Financial Report (CAFR)
- Investment due diligence memos
- Public Equities Guidelines
- Fixed Income Program Guidelines
- Staff broker vote document
- Brokerage Commissions presentation
- ERS Fixed Income Broker Trading Analysis - BVAL

Additionally, NEPC engaged a third-party expert, Elkins/McSherry (a unit of State Street Corp.) to produce an independent Trade Cost Analysis.

- Public Equity trade execution analysis

Standard of Comparison:

NEPC compared the Plan's investment policies, SOPs and legal procedures to the policies of peers (peers are defined by the list of Plans provided by the ERS Staff). Externally managed advisor fees and private market fees were compared to industry averages using ubiquitously known vendors who specialize in aggregating fee data across public and private markets. Investment fees and commissions paid were sourced directly from the Comprehensive Annual Financial Report. NEPC compared the securities brokerage language within ERS' policies, guidelines and internal broker/dealer evaluation documents and compared them to peers and industry prevailing practice.

Findings:

Investment Fees

The direct and indirect fees and commissions paid by the System include fees that are paid by the System and fees that are netted against returns. The System pays management fees,

performance/carried interest, and brokerage fees. Additionally, the System pays custodian fees, security lending agent fees, investment consultant fees, internal staff salaries and investment banking fees.

ERS provided a SOP document addressing the reconciliation of management fees (direct fees) for private market funds as well as one addressing the calculation of management fees due to external advisors for public equity. The Investment Operations Team is responsible for executing the procedures described in these documents on a quarterly or monthly basis. The stated purpose of conducting these procedures is to mitigate the risk of overpaying management fees and the risk of a variance of management fee details and not reconciling with the Custodian book of record.

The private markets and hedge fund asset class teams place an emphasis on fee savings and generally report these metrics to the Board in the annual Asset Class Program Updates. Fee savings can occur by investing in private funds at lower economic terms taking advantage of the size of capital invested. Another way for fee savings to occur is to invest in co-investment opportunities which can offer significant fee savings in comparison to only being invested in the standard commingled funds. The difference between the negotiated terms and the “headline” or standard fees charged over time can grow into meaningful amounts of fee savings to the Trust. All private markets and hedge fund asset classes present negotiated fee savings and average portfolio management and performance/carried interest fees lower than the common “2% investment management fee and 20% carried interest split” levels. The figures presented by ERS Staff in the 2019 Program Updates are shown in Illustration 3.1, below.

Illustration 3.1

Asset Class	Average Management Fee	Average Performance Fee/Carried Interest	Realized Fee Savings (Since Inception)
Private Equity	1.2%	14%	\$166.2 million since 2012
Infrastructure	0.89%	12.1%	\$34.7 million
Real Estate	1.11%	16.9%	\$115 million
Hedge Funds	1.46%	18.75%	

The CAFR discloses fees for externally advised portfolios in addition to all expenses related to investment related activities. Fees are summarized and compared in the chart below. The comparison is subject to several important biases including investment strategy bias (the extent to which the System’s strategies are different than the universe data) and scale bias (the extent to which an investor may be able to negotiate fees based their size) however, we believe that in aggregate, the universe data is sufficiently robust and provides an appropriate comparison. Given the data in Illustration 3.2, below, we conclude that the System has the ability to access complex asset classes that are expected to outperform on a forward-looking basis at attractive investment management fee structures. This is a function of scale, investment program structure, investment process/ governance and strong oversight by Staff and consultants.

Illustration 3.2

Asset Class	Asset Value	Management Fees (\$)	Fees	Median Universe Management Fee	Median Universe Carried Interest	Universe	Number of Observations
Private Equity	4,095,571,471	32,483,346	0.79%	2.0%	20.0%	Preqin Global Private Equity	1,965
Private Real Estate	2,150,080,362	21,675,245	1.01%	1.5%	20.0%	Preqin Global Real Estate	513
Infrastructure	826,701,277	6,128,598	0.74%	1.5%	20.0%	Preqin Global Infrastructure	79
Private Fixed Income	404,580,462	660,740	0.16%	1.75%	20%	Preqin Global Private Debt	448
Hedge Funds	1,780,316,701	18,037,662	1.01%	1.4%	18%	JP Morgan	664
Public Equity	854,530,277	1,674,354	0.20%	0.52%		eVestment All Global Equity	901
Domestic Equity	371,589,228	907,348	0.24%	0.50%		eVestment All US Equity	2,641
International Equity	1,907,858,974	8,190,730	0.43%	0.52%		eVestment Non-US Diversified Equity	673

Source: ERS Texas 2019 CAFR, NEPC

Citing Schedule 4 on pages 88-to-90 of the ERS 2019 CAFR, we find that the itemization of fees related to administrative and investment expenses is thorough and within prevailing industry standard. This list includes expenses for Personnel Services, Professional Services, Materials and Supplies, Communications and Utilities, Maintenance and Other Operating Service Charges. It is important to note, given that the System manages investments internally, that salaries and wages of investment staff are stripped out of the total. As compared to plans of similar size and investment programs the expenses are reasonable and represent a significant cost savings when considering asset size and prevailing investment management fees that external investment managers may charge. Given that ERS currently manages approximately 54% of assets internally (greater than \$15 billion), we believe that significant savings are being accrued as compared to attainable investment management fee structures externally.

Commissions

Securities brokerage commissions are charged by brokers to execute trades within internally and externally managed portions of the Global Public Equity, Public REIT and Fixed Income portfolios. The IPS states that Staff should allocate trades to broker/dealers based on their relative ability to add value to the Trust through:

- A. Products or services of benefit to the investment program such as research products or portfolio analytics that are used in ERS' investment decision-making process;
- B. Trade execution;
- C. Or a commission sharing agreement.

The IPS states further that trades allocated to specific brokers for execution purposes must be executed at discounted commission rates. The policy outlines minimum qualifications for

broker/dealers thereby setting the bar unto which staff must evaluate broker/dealer relationships. Staff monitors broker/dealers through an extensive process wherein domestic and international brokers are evaluated based on 10 categories of performance including staff time spent analyzing the broker/dealer and broker/dealer market share. NEPC believes that a prevailing industry practice has moved to dis-aggregate the evaluation of broker/dealers based on trade execution and research capability. In the past decade, we have seen best-in-breed investment managers focus on trade execution and engage investment research resources separately. This practice may better align with investment outcomes and may allow the system to more thoroughly, directly and transparently value the research for which it pays. We also believe that securities brokerage skill should be measured through an evaluation of trade execution standards and commission costs not solely commission costs as presented in the commission presentation. We note, that best execution is intrinsically tied to portfolio decision value and cannot be evaluated independently.

NEPC did find peers within the System's universe whose securities brokerage policy does not allow for research related activities to be contemplated as part of a best execution securities brokerage model. ERS does have a policy around directed brokerage that is well written. Again, it is believed that broker/dealers should be evaluated based on their ability to execute trades efficiently and add value against the trading strategy that is employed.

The Global Public Equity Program Update to the Board contains an update on the commissions charged to the Trust and how these compare to peer group averages on a per share basis. According to this analysis, the average "all-in" blended commission rate paid by U.S. institutions to brokers on domestic shares was 2.6 cents-per-share while ERS' paid an average of 2.2 cents-per-share. The analysis contained further information regarding international commission rates. The CAFR also lists all commissions charged by all brokers used by the Trust. This is presented with number of shares traded through the counterparty along with commission amount, followed by the commission-per-share.

NEPC has independently verified trading commissions, fees and the performance of the brokers within the ERS program for internally and externally managed portfolios. NEPC collected trade data captured by ERS' custodial bank for the fiscal year ended August 31, 2019 and contracted with a vendor to analyze the trading data. The analysis consists of an itemization, aggregation and evaluation of commissions, fees and the market impact while executing trades to arrive at a total cost of trading. The analysis ranks the ERS experienced trade costs against a universe of peer trades. Commissions are defined as the explicit cost paid to a broker to execute the trade. Fees are defined as stamp duties and taxes levied on each trade; these fees are the cost to use an exchange to buy and sell stocks and vary by country and/or exchange. Market impact is defined as measuring the difference from the Volume-Weighted Average Price ("VWAP") from the time the broker receives the order until the last execution. Full Day VWAP measures the difference from VWAP on trade day. The trading universe is defined as the average cost in all countries where trading is completed. On a daily basis every trade that is executed in 47 countries is stored and each trade is time stamped to the closest second. This data is used to calculate the universe which is a compilation of actual trade data from Elkins/McSherry customers. The Universe contains over 63 million trading transactions, \$4.8 trillion in principal, and 342 billion shares of trading. Institutional averages are calculated for commissions, fees, and market impact costs quarterly in 47 countries. For example, if trading was completed in 20 countries then a summary universe is created by principal weighting each of the 20 country universes by the amount of trading done in the country. Summary universes are created for average stock prices, commissions, fees and market impact.

ERS aggregate Public Equity data for the fiscal year ended August 31, 2019 is presented in Illustrations 3.3 – 3.5, below. The data is based on \$12.66 billion in principal traded, 1.59 billion shares traded and 16,640 trades.

Illustration 3.3

TOTAL PORTFOLIO COST PERFORMANCE									
Side	COMMISSION			Fees		MARKET IMPACT		Total Cost	Total Cost/Savings Vs. Universe
	Your Avg. Commission	Bundled Universe	All Trading Universe	Fees	Universe	Full Day VWAP	Universe Full Day VWAP		Commission+Fees Full Day VWAP
	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)
Sell	+7.01	+14.51	+2.53	+1.52	+1.21	+7.17	+2.42	+15.70	2.43
Buy	+6.51	+14.47	+2.54	+4.28	+3.27	+5.25	+1.96	+16.04	3.67
Total	+6.78	+14.49	+2.53	+2.79	+2.16	+6.29	+2.21	+15.86	3.00

Source: BNY Mellon, Elkins/McSherry

Bundled Universe is defined as the average cost of all trades and commissions for brokers providing research and other services.

All trading Universe is defined as the average cost of all trades.

Market Impact is defined as Full Day Volume-Weighted Average Price

Referencing Illustration 3.3, above, ERS compares favorably to the universe of trades that are executed based on providing research services in addition to trade execution. In fact, ERS commissions are approximately 53% less expensive than the universe. Market Impact is approximately 185% more than the universe. Note, in aggregate Full Day VWAP is an acceptable performance benchmark and may serve as a good tool to understand the overall trading performance of the asset class. In total, the cost savings versus the universe was 3 basis points; a strong outcome.

Illustration 3.4

Internal Management	% Principal Traded	Commission		Market Impact		Total Cost/Savings
		Commission	Bundled Universe	Full Day VWAP	Universe Full Day VWAP	Comm.+Fees+FDVW AP vs Universe
Manager 1	19.8	2.50	14.31	5.20	1.59	8.18
Manager 2	7.9	11.27	13.66	8.52	3.52	4.51
Manager 3	7.3	11.41	15.70	5.88	2.45	0.23
Manager 4	5.5	11.00	13.64	2.41	2.89	3.02
Manager 5	5.5	2.96	14.31	8.27	1.59	4.63
Manager 6	5.5	3.87	14.32	2.33	1.59	9.70
Manager 7	3.7	2.64	14.31	7.89	1.59	5.26
Manager 8	2.9	10.25	14.39	6.23	2.35	3.15
Manager 9	2.7	1.86	14.31	10.25	1.59	3.77
Manager 10	2.5	5.02	14.34	7.40	1.59	3.47
Manager 11	1.7	17.95	21.02	1.61	2.72	4.20

Source: BNY Mellon, Elkins/McSherry

Referencing Illustration 3.4, above, ERS Internal Management compares favorably to the total cost of the universe. Of note, when principal traded is significant in size the cost savings is high. Only three of eleven portfolios are more expensive versus the universe. Within these portfolios the market impact costs are driving the performance while commissions are notably lower than the universe. Portfolio savings is being driven by lower commissions ranging from approximately 3 basis points (0.03%) to 8 basis points (0.08%) in savings.

Illustration 3.5

BROKER PERFORMANCE (FULL DAY VWAP)											
						COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS
Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission + Fees + Full Day VWAP Vs. Universe (bp)
B1	1,640	1,479	12.95%	1,109,082	0.16	977,306	+5.96	+14.29	+9.06	+1.94	0.90
B2	822	1,450	6.49%	566,979	0.22	643,046	+7.82	+14.76	+8.29	+2.44	0.30
B3	802	857	6.33%	935,484	0.16	477,059	+5.95	+14.52	+7.60	+2.11	2.56
B4	664	731	5.24%	908,008	0.13	521,815	+7.86	+14.25	+6.71	+2.97	1.82
B5	634	776	5.01%	817,274	0.09	317,943	+5.01	+15.05	+4.12	+2.20	6.93
B6	561	1,070	4.43%	524,522	0.16	326,106	+5.81	+14.97	+9.32	+1.93	1.18
B7	557	985	4.40%	565,059	0.09	333,763	+6.00	+14.85	+10.61	+2.09	+0.16
B8	509	274	4.02%	1,857,749	0.16	0	+0.00	+14.29	+3.13	+1.62	12.82
B9	482	679	3.81%	709,838	-0.07	397,501	+8.25	+14.25	7.40	+2.36	14.76
B10	420	502	3.32%	837,632	0.20	204,417	+4.86	+14.15	+11.43	+1.88	+0.59

Source: BNY Mellon, Elkins/McSherry

Referencing Illustration 3.5, the above list of brokers makes up 56% of the principal traded within the public equity program for the fiscal year ended August 31, 2019. The securities brokerage choices have been broadly cost saving versus the universe primarily driven by commission savings. Notably, broker B9 has exceptional market impact versus the universe and has a high percentage of principal traded. All but two brokers in the top 10 of principal traded are driving cost savings; a strong result.

We did find that the fixed income group does track trade efficiency using Bloomberg. We find this practice to be a prevailing industry practice and encourage memorialization of the practice into SOPs. In particular, since Bloomberg is the preferred pricing source for the fixed income portfolio, using BVAL as the source to evaluate the efficiency of trading is a best practice.

The IPS does not specify that fees should be monitored or reported to the Board. This responsibility is not clearly defined in ERS' investment policies. However, ERS' fees are clearly reported in the CAFR. With the recent adoption of SB 322, it is now state law that all direct and indirect commissions and fees paid by the System during the System's previous fiscal year be reported in the CAFR annually. The preparation of this section of the CAFR is ERS' Finance department.

Fees charged to the System are reported annually in the CAFR and should encompass all forms of manager compensation. A possible exception to this may be if investment managers own subsidiaries that provide services to the funds and charge the funds for those services. This can occur in certain cases where the investment manager is vertically integrated and these fees for services that are charged by the subsidiary can constitute an additional form of compensation to the investment manager. The policies and procedures that have been reviewed and evaluated demonstrate that appropriate procedures are in place to account for and control investment expenses.

According to the policies and procedures provided, fees are checked for reasonableness monthly for external advisors for public equity, and on a quarterly basis for private markets. This is done by reconciling the reported and paid management fees provided by the General Partner quarterly in account statements to the fee calculated internally by ERS Staff based on the LP Agreement or other similar agreement with the External Advisor. The Investment Operations Team requests the Asset Class Team follow up with General Partners when there are differences greater than $\pm 10\%$ for an explanation of the differences. This $\pm 10\%$ check is an appropriate reasonableness check.

Enhancement Recommendations:

- The management and monitoring of direct and indirect compensation paid to investment managers and other service providers should be more clearly defined in the IPS or other policies that state what should be presented to the Board on an at least annual basis.
- An annual review of investment fees should include a fee analysis based on peer group or industry averages for the relevant asset classes in aggregate as well as by investment strategy type. A strategy level fee analysis will allow for a deeper look into terms and scale-based savings of the investment program. We also recommend a fee analysis that incorporates performance outcomes. We recommend that the analysis include an evaluation of internal investment management cost versus similar external investment manager costs.
- Consider adding an evaluation metric on securities brokerage vendors based on execution skill. Execution skill should be measured using an appropriate benchmark for each broker incorporating metric on trading efficiency and impact on performance.
- Consider disaggregating research and securities brokerage costs as it may be difficult to measure the value of research and ensure best execution.
- Consider memorializing through policy or guidelines the business model of securities brokerage, how performance is measured ensuring incorporation of broker quantitative analysis and performance outcomes.
- As we identified in Section 1, the responsibility for monitoring and reporting fees to the Board of Trustees is not clearly defined in the System's policies. ERS should consider formalizing this process as doing so may provide additional incentive for Staff to negotiate better fees with their investment managers.
- The Fixed Income Program Guidelines should define broker/dealer relationships and the governance of those relationships.
- An additional aspect to consider is that given ERS' size, it has the potential to negotiate better rates than the "headline" rates charged to smaller (in AUM) investors. The difference between ERS' rates and headline rates can be considered fee savings and this should be tracked systematically. This is currently tracked by the private equity team and reported to the Board and IAC, however this can likely be done across the private markets and public markets asset classes.

Section 4. Review of Governance Processes Related to Investment Activities

Activities Completed:

NEPC requested and, in timely fashion, received materials from ERS Staff to document the roles of Board members, how Board members are selected, the terms of their appointment/election, as well as detailed biographies on current Board members. Staff provided NEPC a description of the role of the ERS Investment Advisory Committee as a resource to the Board, a list of current IAC members as well as a skills inventory of each member's asset class specialization. NEPC also reviewed documents listing fiduciary education standards required by the State of Texas Pension Review Board. In interviews with ERS staff, NEPC inquired how each Board member's compliance with these educational requirements is monitored.

As part of our ERS governance analysis, NEPC evaluated the following documents.

- Texas Constitution, Article XVI, Section 67
- Texas Government Code Title 8, Subtitle B, Chapter 815
- Texas Administrative Code, Title 34, Part 4
- ERS Investment Policy Statement
- ERS Board Minutes
- ERS Board Bios
- <https://ers.texas.gov/About-ERS/ERS-Board-of-Trustees/Members/Bios>
- ERS Investment Advisory Board Skills Assessment
- Texas Pension Review Board MET website
- <https://www.prb.texas.gov/resource-center/trustees-administrators/educational-training-program/>
- ERS Peer Group provided by Staff

Standard of Comparison:

NEPC compared the governance structure of ERS against governance information publicly available on the websites of the 20 institutional investors identified by ERS as its peers. We also asked our NEPC colleagues for feedback on whether ERS Board governance is consistent with leading and prevailing practice among the dozens of other U.S. public pension funds to whom our consultants advise.

Findings:

ERS draws its authority from Article XVI, Section 67 of the Texas Constitution:

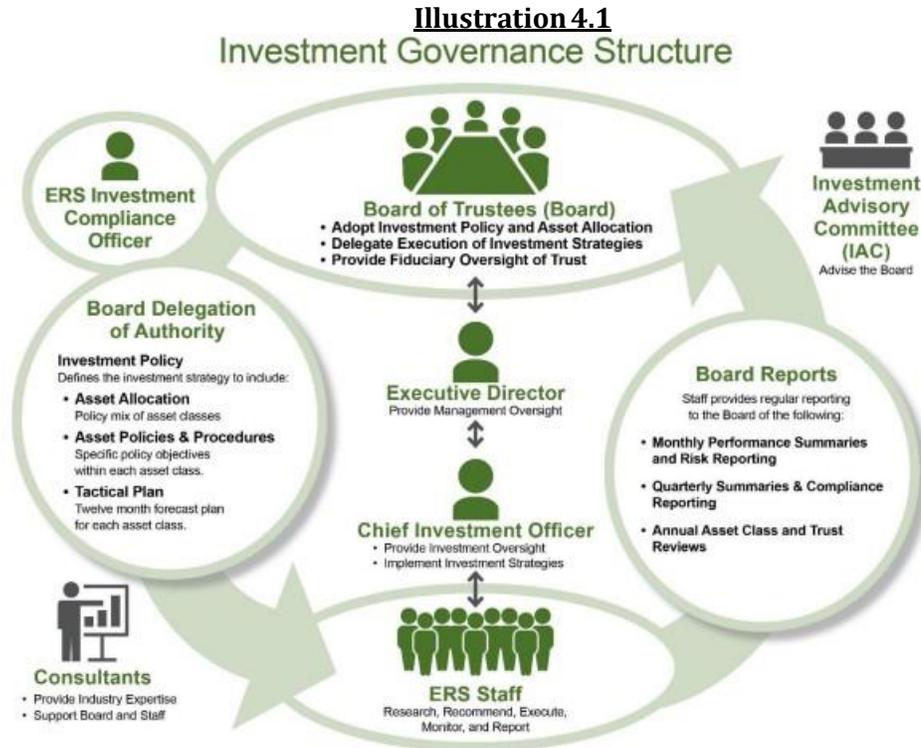
“The legislature shall establish by law an Employees Retirement System of Texas to provide benefits for officers and employees of the state and such state-compensated officers and employees of appellate courts and judicial districts as may be included under the Retirement System by law.”

According to the ERS IPS, the Retirement System has a fiduciary responsibility to:

1. Manage the assets for the exclusive benefit of the Beneficiaries;
2. Adopt a long-term asset allocation;
3. Establish prudent investment policies defining investment objectives and strategies;
4. Seek to maximize investment returns while maintaining the safety of principal;
5. Diversify the assets to reduce risk of loss;
6. Monitor investment performance;
7. Efficiently manage the costs associated with implementation of the Trust; and

8. Exercise reasonable care consistent with ERS' fiduciary duty, and maintain the integrity of the investment program

To execute this fiduciary responsibility, ERS has established a governance structure that includes a Board of Trustees, which delegates authority to the Executive Director, Investment Advisory Committee, Asset Class Investment Committees, Investment Staff, Compliance Staff, and to external vendors hired by the Board including Investment Consultants, a Retirement Actuary, a Custodian, External Advisors and Emerging Managers. Illustration 4.1, below, is a helpful visualization of the System's governance structure.



ERS does an excellent job of illustrating a roadmap of how decisions are made at ERS. Illustrations 4.2 and 4.3, below, break out the roles of each contributor to the governance process. Authority is characterized by Approval, Recommendation and Oversight.

Illustration 4.2
POLICY LEVEL INVESTMENT RESPONSIBILITIES

Investment Responsibility	Board of Trustees	IAC	Executive Director	CIO/Investment Staff	Consultant / Actuary (as applicable)
Investment policy statement	A*	R	R	R	R
Asset allocation and establish risk tolerance*	A	R	R	R	R
Permissible asset classes	A	R	R	R	R
Performance benchmarks	A	R	R	R	R
Decisions about deviations from policies	A	R	A**	R	R
Selection of general plan consultant*	A	N/A	R	R	N/A
Selection of asset class consultants	A	N/A	R	R	N/A
Selection of custodian bank*	A	N/A	R	R	R
Selection of securities lending agent*	A	N/A	R	R	R
Selection of actuarial discount rate	A	N/A	R	R	R
Proxy voting policy	A	R	R	R	R
Selection of proxy agent	--	--	A	R	N/A
Selection of IAC member	A	N/A	N/A	N/A	N/A

A = Approval Authority, R = Provides Recommendation,

* Approval authority is statutory.

** Approval in circumstances when timing does not allow presenting to the Board and such action is in the best interest of ERS. Followed by reporting to the Board and IAC.

Illustration 4.3
IMPLEMENTATION RELATED INVESTMENT RESPONSIBILITIES

Investment Responsibility	Board of Trustees	IAC	ACIC	Executive Director	CIO/ Investment Staff	Consultants (as applicable)
Approval of Alternative Investments Over Statutory Threshold ⁺	A	R	R	R	R	R
Approval of External Advisors	O	O	A	R	R	R
Approval of Discretionary Managers and Alternative Investments Under Statutory Threshold	O	O	A	R	R	R
Funding and Defunding of External advisors	O	O	O	O	A	R
Contract Execution*	O	N/A	N/A	A	R	N/A
Rebalancing/Asset Overlays	O	R	N/A	O	A	R
Derivatives – Internally Managed	O	O	N/A	O	A	R
Derivatives – External Managed	O	O	A	O	R	R
Risk Management	O	R	R	O	A	R
Proxy Voting	O	O	O	O	A	R

A = Approval Authority, R = Provides Recommendation, O = Provides Oversight

* Approval authority is statutory and/or regulatory.

+ - Pursuant to Texas Government Code Section 815.3016, the ERS Board approve alternative investments over 0.6% of the total market value of the Trust's assets as reported in the most recent ERS CAFR.

The Board of Trustees

Per Article XVI, Section 67 of the Texas Constitution, “each statewide benefit system must have a board of trustees to administer the Retirement System and to invest the funds of the Retirement System in such securities as the board may consider prudent investments. In making investments, a board shall exercise the judgment and care under the circumstances then prevailing that persons of ordinary prudence, discretion, and intelligence exercise in the management of their own affairs, not in regard to speculation, but in regard to the permanent disposition of their funds, considering the probable income therefrom as well as the probable safety of their capital.”

As stated in ERS’ IPS, the ERS Board is responsible for formulating, adopting, and overseeing the investment policies of the Trust. Pursuant to Texas Government Code Section 815.3016, the Board retains responsibility to approve alternative investments over 0.6% of the total market value of the Retirement System's assets as reported in the most recent ERS Comprehensive Annual Financial Report (CAFR).

The six-member ERS Board of Trustees currently has one seat vacant. Three members are appointed by statewide political leaders. The Governor, House Speaker and Supreme Court Chief Justice of the State of Texas each appoint one Board member. Three other Board members are elected by members and retirees in the Texas Employees Retirement System in accordance with Texas law and rules adopted by the Board.

Per Texas Government Code Section 815.003, both appointed and elected Board Members serve staggered six-year terms. The terms of appointees expire on August 31 of each even-numbered year. The terms of elected Board Members expire on August 31 of each odd-numbered year. To be eligible to serve as an elected member of the board, a person must be a member of the retirement system and must hold a position that is included in the employee class of membership. No elected Board Member may work for the same agency or department as another Board Member. The board shall hold elections for the members and retirees to nominate and elect a trustee. The board shall make ballots available to members of the retirement system and retirees and all votes must be cast on those ballots as well as through an online voting process. The board shall fill vacancies of elected positions on the board for the unexpired terms.

In the last election, in the summer of 2019, almost 34,000 ballots were cast statewide in an election that was decided by a margin of 315 votes. The trustee elections are administered by an independent third party.

Before taking office as a member of the board of trustees, a person shall subscribe to two oaths of office. One is required by the Texas Constitution to be taken by all State Officers. The other oath is specific to ERS trustees, and it states the following:

"I do solemnly swear that I will, to the best of my ability, discharge the duties of a trustee of the Employees Retirement System, that I will diligently and honestly administer the affairs of the Board of Trustees of the retirement system, and that I will not knowingly violate or willingly permit to be violated any of the laws applicable to the retirement system".

Qualifications of Board:

Ilesa Daniels (Chair)
Elected Board Member

Elected in 2015, Ilesa Daniels began her career with the Texas Health and Human Services Commission in 1990 as a Texas Works Advisor. She was later promoted to Case Analyst and is currently a Program Specialist in Quality Assurance Field Services. She also mentors' new employees as they begin to navigate through their careers.

Ms. Daniels is active in civic organizations in her community. She volunteers at a homeless shelter and mentors' young girls in the Houston area.

Ms. Daniels holds a Bachelor of Science in Sociology with a minor in Psychology from Texas Southern University. Her term expires August 31, 2021.

Craig Hester (Vice Chair)
Appointed Board Member

Originally appointed in 2005. Most recently reappointed by Chief Justice Wallace Jefferson. Craig Hester has been actively involved in professional investment management since 1972. Mr. Hester is a Principal at Luther King Capital Management. Prior to joining LKCM, he formed Hester Capital Management, where he acted as Chairman, CEO and Chief Investment Officer. Before that, Mr. Hester served as Director of Regional Asset Management for InterFirst Investment Management, Chief Investment Officer of the Texas Municipal Retirement System, Assistant Vice President & Trust Officer at Republic National Bank, Dallas and Senior Analyst for the Teacher Retirement System of Texas.

He currently serves on the Advisory Committee of the MBA Investment Fund, LLC of the University of Texas Graduate School of Business. Mr. Hester is a former board member of the University of Texas Investment Management Company (UTIMCO), former Investments Committee member and past chair of the University of Texas' Ex-Student's Association, former member and past chair the Investment Advisory Committee of the Employees Retirement System of Texas and former investment advisor to the Teacher Retirement System of Texas. He is the past president of the Austin Investment Association and a member and past president of the Austin/San Antonio Society of Financial Analysts and the Austin Society of Financial Analysts. He is a former member of the Board of Governors of the Investment Adviser Association (IAA), a current Board member and past chairman of the Board of Trustees of the Joe R. and Teresa Lozano Long Center for the Performing Arts and is a former member and past chair of the Foundation for SafePlace. Mr. Hester is a member of the Executive Committee of the University of Texas Chancellor's Council and of the Littlefield Society.

Mr. Hester received his Bachelor of Business Administration and Master of Business Administration at the University of Texas at Austin. He received the Chartered Financial Analyst designation in 1977 and the Chartered Investment Counselor designation in 1992. His term expires August 31, 2022.

Brian Barth
Elected Board Member

Elected in 2019, Brian R. Barth is the Director of Project Planning and Development for the Texas Department of Transportation (TxDOT), responsible for overseeing the Transportation Planning and Programming, Right of Way, Environmental Affairs, Professional Engineering Procurement and Transportation Programs divisions.

A member of the TxDOT family since 1988, Mr. Barth began his career as an engineering assistant in the Dallas District. In 2003, he was appointed as the Dallas District's director of transportation planning and development. From 2009 to 2013, he served as the Fort Worth District's deputy district engineer, providing joint oversight and development of the DFW Connector, North Tarrant Express, I-35W, I-30 and Chisholm Trail Parkway.

In November 2013, Mr. Barth was appointed as Fort Worth district engineer and served on the Regional Council of the North Central Texas Council of Governments working to solve Metroplex-area transportation issues. In that role, he also oversaw over \$1 billion in construction work each year in addition to major projects on I-35W, SH 360 South and the I-30/SH 360 Interchange.

Mr. Barth graduated from the University of Texas at Austin with a Bachelors degree in civil engineering. His term expires August 31, 2025.

James Kee, Ph.D.

Appointed Board Member

Appointed in 2018 by Texas House of Representatives Speaker Joe Straus. James (Jim) Kee, Ph.D. is the President and Chief Economist of South Texas Money Management (STMM), where he works with both the investment research group and the portfolio team. He joined the firm in 2009 and was appointed President in 2011. Before joining STMM, Dr. Kee was the HOLT Global Strategist for Credit Suisse in Chicago. He served as a Portfolio Consultant with HOLT Value Associates prior to their acquisition by Credit Suisse in 2002. Dr. Kee also has produced research under contract for the Institute for Research on the Economics of Taxation (IRET) and Polyconomics. He has taught course in finance and economics at Wabash College and Auburn University.

With expertise in combining top-down macroeconomic insights with bottom-up stock selection tools, Dr. Kee has been nationally recognized for his views on investing and the economy. He has made numerous appearances on Fox Business with Maria Bartiromo and on CNBC. He has been interviewed on or cited by many other media outlets, including Bloomberg Radio's "Taking Stock," MarketWatch Radio, Bloomberg News, The Wall Street Journal, Barron's, Financial Times, CNN Money and U.S. News & World Report. In 2016, the San Antonio Business Journal recognized Dr. Kee as a top executive with a C-Suite Award in the CEO category.

Dr. Kee serves on the St. Edward's Munday School of Business Advisory Board and has advised several non-profit organizations. In the past, he has served on the board of directors for the Catholic Citizens of Illinois, the University of the Incarnate Word Advisory Board and as finance chair on the school council for the Archdiocese of San Antonio.

Dr. Kee has a Ph.D. in Economics from Auburn University; a Master's degree in Economics (Distinguished Graduate) from St. Mary's University of San Antonio and a Bachelor of Arts in Economics from St. Edward's University in Austin. His term expires August 31, 2020.

Catherine Melvin

Elected Board Member

Elected in 2017, Catherine Melvin serves as the Chief Auditor for the Texas Department of Public Safety. A career public servant, Ms. Melvin has extensive experience in Texas state governmental internal auditing, including more than 20 years' service as Chief Audit Executive. She began her career as an Auditor I and has since worked in several state agencies across various sectors, including health/human services, regulatory, statewide oversight and public safety.

A leader in both state government and the internal audit community, Ms. Melvin has served on and led numerous interagency and professional committees and task forces. She has focused her career in public service – assisting Texas state agencies in achieving their goals and objectives while being accountable to the public for efficiency, transparency, economy, effectiveness and excellence.

Ms. Melvin holds a Bachelor's degree from the University of Central Texas (now known as Texas A&M University Central Texas) with a concentration in Accounting. She is also a graduate of the Governor's Executive Development Program and of the Texas Fiscal Officers' Academy. Ms. Melvin

holds the designations of licensed Certified Public Accountant, Certified Internal Auditor and Certified Law Enforcement Auditor. Her term expires August 31, 2023.

Structure of Board:

NEPC finds the structural composition of the ERS Board to be consistent with prevailing practice among US public fund Trustee Boards. The presence of members appointed by elected representatives of the Plan Sponsor (the State of Texas) as well as elected members who are Participants in the Plan demonstrates an alignment of interest in the success of achieving the goal of ERS to prudently administer the Trust and pay retirement benefits. The two current appointed Board members are both financial professionals with many years of experience in the investment industry.

The size and composition of the ERS Board is also consistent with prevailing practice among the 20 government-sponsored allocators that ERS names as peers (see Illustration 4.4, below). The boards of the peer group range in size from three to 20 members. In most cases, some board members are elected, and some are appointed by state officials. SBA Florida is an outlier with the State Governor, Chief Financial Officer and Attorney General serving directly as the ex-officio Trustees, with ultimate authority and oversight for the SBA’s overall strategy. Texas Treasury and Safekeeping Trust Co. is a unique entity, with the Texas Comptroller of Public Accounts serving as the sole trustee and shareholder. At the other end of the spectrum among the peer group Tennessee Consolidated Retirement System, South Dakota Retirement System and Colorado PERA have the largest boards with 20, 17 and 16 members, respectively.

Illustration 4.4

<u>Peer System</u>	<u>Board Members</u>	<u>Selection Method</u> <u>Appointed, Elected, Ex-Officio</u>	<u>Inv. Advisory Committee?</u>
CalPERS	13	A=3, E=6, Ex-O=4	No
CalSTRS	12	A=5, E=3, Ex-O=4	No
Colorado PERA	16	A=3, E=12, Ex-O=1	No
SBA Florida	3	A=0, E=0, Ex-O=3	Yes
ERS Georgia*	7	A=1, E=3, Ex-O=3	No
Indiana PRS	9	A=3, E=0, Ex-O=6	No
MassPRIM	9	A=3, E=4, Ex-O=2	Yes
Maryland SRPS	16	A=7**, E=5, Ex-O=4	Yes
Michigan ORS	12	A=11, E=0, Ex-O=1	No
Ohio PERS	11	A=3, E=7, Ex-O=1	No
Ohio SERS	9	A=3, E=6, Ex-O=0	No
Ohio STRS	11	A=3, E=7, Ex-O=1	No
Oregon PERF	5	A=5, E=0, Ex-O=0	No
South Dakota RS	17	A=2, E=14, Ex-O=1	No
Tennessee Consolidated RS	20	A=0, E=11, Ex-O=9	No
Texas Permanent School Fund	5	A=0, E=5, Ex-O=0	No
ERS	6	A=3, E=3, Ex-O=0	Yes
TRS Texas	9	A=9, E=0, Ex-O=0	No
Texas Treasury Safekeeping	1	A=0, E=0, Ex-O=1	Yes
Virginia RS	9	A=5, E=4, Ex-O=0	Yes
State of Wisconsin IB	9	A=8, E=0, Ex-O=1	No

Information and Training Available to Board:

Adequate information is available to the ERS Board via readily accessible Board Meeting Agendas and Minutes. The Board is supported by education and training regarding the members’ fiduciary responsibility. Upon appointment or election to the Board, new members are provided with an “orientation binder” which includes information on all the divisions within ERS. The 83rd Texas Legislature required the Pension Review Board (PRB) to establish a Minimum Educational

Training (MET) Program for trustees and system administrators of Texas public retirement systems. The Core training is available to trustees on-line and is designed to cover the fundamental competencies of public pensions necessary for trustees and system administrators to successfully discharge their duties. The Core training courses are:

Benefits Administration – 45 minutes

Risk Management – 60 minutes

Ethics – 45 minutes

Governance – 45 minutes

Actuarial Matters – 90 minutes

Fiduciary Matters – 60 minutes

Investments – 90 minutes

All trustees must complete 7 credit hours of Core training in their first year and 4 credits hours of continuing education for each following two-year period. At this time, ERS is approved to provide continuing education courses but no core classes. ERS Board members can schedule internal training sessions using “primers” that provide deeper understanding of an asset class and its role in the ERS portfolio.

Delegation of Authority

The Board delegates some responsibility to several Asset Class Investment Committees, as well as to the Executive Director, Investment Staff, Compliance Staff, and external vendors hired by the Board including Consultants, an Actuary and a Custodian. The Investment Advisory Committee assists the Board in carrying out its fiduciary duties with regard to the investment of the Trust and related duties.

The Investment Advisory Committee

The presence of an Investment Advisory Committee (IAC) is a governance component that NEPC believes is above the level of prevailing practice among U.S. public pension plans. The IAC assists the Board in carrying out its fiduciary duties about the investment of the Trust and related duties. The IAC was created to consult and advise the ERS Board of Trustees on investments and investment related issues. This Advisory Committee reviews investment strategies and related policies of ERS to provide comments and recommendations to assist the Board in adopting prudent and appropriate investment policies. In addition, from time to time, together with the Staff and investment consultants or advisors, they recommend to the Board asset mix, portfolio strategy, investment policies, and eligible securities.

The IAC was established at the discretion of the Board pursuant to Texas Government Code § 815.509 and Texas Administrative Code § 63.17(b) with the committee composed of at least five and not more than nine members. Currently, there are seven IAC Advisors serving as a source of investment expertise to the Board. IAC members serve at the pleasure of the Board for staggered terms of three years at a compensation and reasonable reimbursement as determined by the Board. The IAC members select a chair and vice chair, for a two-year term, to serve as liaison to the Board and to preside over IAC meetings. Generally, the IAC meets quarterly, on the same day as each Board meeting, to consider investment-related issues in depth.

The IAC members offer an impressive breadth and depth of practitioner experience, as catalogued in the skills inventory outlined in Illustration 4.5, below.

Illustration 4.5

	Term Expiration	Investment Experience	Global Equity	Fixed Income	Private Equity	Real Estate	Hedge Funds	Infrastructure	Derivatives
IAC Chair, Bob Alley, CFA Retired from AIM Advisors, Inc. as Chief Fixed Income Officer	8/31/2021	43 years	X	X	X				
IAC Vice-Chair, Gene L. Needles, Jr. Chairman and CEO Resolute Investment Management	5/31/2020	25 years	X	X	X	X	X		X
Caroline Cooley Managing Partner – Hedge Funds Crestline Investors, Inc.	12/31/2019	34 years		X			X		X
James Hille, CFA, CAIA CIO Texas Christian University Endowment	8/31/2020	27 years	X	X	X	X	X		
Ken Mindell Sr. VP, Treasurer & Director of Investments Rosewood Management Corporation	5/31/2022	38 years	X	X	X	X	X	X	X
Laurie Dotter Retired from Transwestern Corporation Properties as President	5/31/2022	35 years				X		X	
Didi Weinblatt, Ph.D., CFA Retired from USAA Investment Mgmt Co as Vice President, Mutual Fund Portfolios	8/31/2020	38 years	X	X					

Among the 20 allocators identified as peers by ERS, only five appear to have similar advisory councils of investment professionals to serve as a resource to their board.

The nine-member SBA Florida Investment Advisory Council provides independent oversight of SBA’s funds and major investment responsibilities. Additionally, the Council meets quarterly to discuss general policies such as risk budgets, alternative investments, and investment protection principles, while more broadly covering topics related to the general economic outlook.

The 12-member MassPRIM Investment Committee (IC) advises the Board with respect to the asset allocation policy of PRIM and related investment policies and assists the Board in overseeing the investment program. The mandate of the IC does not include real estate or timber. For these real assets, the Board also established a Real Estate and Timberland Committee (currently ten members) to advise the Board in setting investment policy within the real estate and timber portfolios and assist the Board in overseeing these portfolios.

Maryland SRPS has a group of three Public Advisors to the Investment Committee, chosen based on their professional educations and credentials in the investment industry. The Board selects these Advisors to 3-year terms.

The Texas Treasury Safekeeping Trust Company is a special-purpose entity established by the Texas Legislature as a stand-alone organization with the Texas Comptroller of Public Accounts as its sole shareholder and director. The Comptroller appoints an Investment Advisory Board of financial professionals (currently 6 members).

Virginia Retirement System appoints an 8-person Investment Advisory Committee.

The Asset Class Investment Committees

Certain IAC members are designated as members of Asset Class Investment Committees (further described below) from time to time as determined by the CIO, in consultation with the Executive Director.

An Asset Class Investment Committee (ACIC) is assigned to each asset class to review that asset class' prospective investments, ensuring that they conform to the investment objectives outlined in this Policy and are prudent given current and anticipated market dynamics. Each ACIC is comprised of the Executive Director, the CIO, an IAC member, and a senior member of Staff. In addition, there are non-voting members with one staff member from each of the Office of the General Counsel (OGC) and Investment Compliance. Attendance by these non-voting members is not compulsory; however, Investment Compliance must certify prior to the vote that the pending investment is in compliance with the Policy. Each ACIC reviews investment recommendations prepared by Staff and, if applicable, the consultant. Each ACIC will approve or deny the investment decision based on information provided as well as investment information available to ACIC members based on their respective professional expertise. If the investment amount is under the dollar amount of the Board approval authority, which for alternative investments is over 0.6% of the total market value of ERS' assets as reported in the most recent ERS CAFR, then the ACIC will approve or deny the decision.

The Executive Director

In accordance with Texas Government Code § 815.301(b) and § 4 Texas Administrative Code §65.1, the Executive Director is delegated full authority and responsibility by the Board to perform the responsibilities of the Board and in the implementation and administration of the Trust subject to Board policies, rules, regulations, and directives consistent with constitutional and statutory limitations. The Executive Director establishes procedures and controls for efficient implementation of the Trust by Staff. The Executive Director may delegate to another employee of ERS any right, power or duty assigned to the Executive Director pursuant to Texas Government Code § 815.202(f). Any reference to Staff responsibilities in the IPS, including any addendum to the IPS, should be construed to mean that the Chief Investment Officer (CIO) has supervisory and oversight authority of such delegated responsibilities.

Porter Wilson was appointed executive director of the Employees Retirement System of Texas on June 1, 2015.

Under his guidance, ERS administers programs that provide retirement, deferred compensation and flexible benefits for more than 225,000 state employees and retirees. ERS is entrusted with an investment portfolio of approximately \$29 billion and is responsible for managing the Texas

Employees Group Benefits Program, which provides health care coverage to more than 530,000 state and higher education employees, retirees and their families.

Mr. Wilson most recently served as associate vice chancellor for governmental relations for the Texas Tech University System. He spent most of his career, from 1996 to 2014, serving as Chief of Staff for Texas State Senator Robert Duncan. In that role, Mr. Wilson worked closely with ERS on legislation related to state employee benefits, demonstrating a strong commitment to ERS members and retirees, as well as keen knowledge of state government, benefits and budgets. Prior to leading Duncan's Senate staff, Mr. Wilson was his legislative assistant when he served in the Texas House of Representatives.

In his years in state government, Mr. Wilson earned the respect of lawmakers, colleagues and other associates. He has long-term relationships throughout Texas state government, and with employee and retiree associations and organizations. He received the Texas Public Employees Association's Public Service Award for the 83rd legislative session and was named the Department of Public Safety Officers Association's Legislative Staffer of the Year for both the 82nd and 83rd sessions.

Mr. Wilson holds a Bachelor of Arts in Government from the University of Texas at Austin.

ERS Investment Staff

Although the Board maintains oversight of the investment of Trust, the Board performs its fiduciary responsibility to invest the Trust through delegation of authority to the ERS Investment Staff for execution of the investment strategy according to this Policy.

In accordance with Texas law, the Staff is employed by ERS and authorized by the Executive Director to provide professional investment analysis and support. Responsibilities include portfolio management; company and investment analysis and research; review and monitoring of external investment consultants and advisors and their recommendations; trade execution; voting of proxies and maintenance of the ERS Proxy Voting Guidelines; and the development, recommendation and implementation of this Policy, asset allocation, portfolio structure, advisor/consultant selection, and custodian selection.

The Investment Staff reports to the Chief Investment Officer, Tom Tull, CFA. Per his biography, Mr. Tull was previously a founding partner of Gulfstream Global Investors, Ltd., an SEC-registered investment adviser specializing in international equity management that was sold to West LB of Germany in January 2001.

Mr. Tull is the former Director – Employee Benefit Fund Investments for The LTV Corporation and served as President of Western Reserve Capital Management, Inc., the pension asset management subsidiary of The LTV Corporation. In this capacity, he was responsible for the investment of a \$1.2 billion retirement trust. This responsibility included the management of a \$90 million international equity portfolio and the management of the outside investment manager relationships.

Prior to joining LTV in February 1983, Mr. Tull served for seven years as Director – Pension Investments of The Cleveland-Cliffs Iron Company. He managed an in-house pension fund, introduced international investing and other diversification policies, and performed a variety of corporate duties. His investment career began in 1971.

While in the private sector, Mr. Tull provided his expertise to ERS as a member of the Investment Advisory Committee to its Board of Trustees. He served in this role for 11 years before joining ERS as the Director of Strategic Research, focused on developing ERS' hedge fund program and further expanding its investment program.

He also served a three-year term as member of the National Adjudicatory Council of the Financial Industry Regulatory Authority (FINRA). FINRA is the largest independent regulator of securities firms doing business in the United States.

Mr. Tull received a B.S. in Finance from Ohio State University and an M.B.A. from Xavier University, and is a CFA® Charterholder. He also is an Advisory Board Member of a variety of organizations such as Institutional Investor and Sponsor for Education Opportunity (SEO). Mr. Tull is a U.S. Army veteran with service time in both Korea and Vietnam.

Compliance

The Board views adherence to the Investment Policy and the Investment Compliance function as important components of the investment process and to achieving the overall objectives of the Trust. Staff are responsible for ensuring that investment activities comply with this Policy. ERS Investment Compliance is responsible for the overall monitoring, testing and reporting related to compliance with this Policy and each of the Asset Class tactical plans, which is an annual report submitted by each asset class detailing guidance for investment implementation. Investment Compliance will notify Staff, the CIO, the Executive Director and the Board of any violations of the Policy or intent of the Policy. On a periodic basis not less than annually, Investment Compliance will present to the Board the results of compliance activities performed during the review period and any material compliance issues. Investment Compliance will also develop and maintain internal policies and procedures related to the ERS compliance program.

Investment Consultants

ERS retains several professional Investment Consultants (including NEPC, LLC as General Consultant) to assist and advise the Board and Staff in connection with the investment of Trust assets. The Investment Consultants advise the Board on the management of the Trust. This may include, but is not limited to, recommending appropriate strategic policy and implementation structure, conducting manager due diligence, and assisting with manager searches and selection. The Investment Consultants also aid the Board in its oversight function and adhering to the guidelines of this policy and making recommendations regarding changes should they be deemed to be prudent.

Retirement Actuary

The Board selects and retains an actuary for forecasting asset and liability growth and the many complex factors included in estimating future pension costs. These factors include, but are not limited to, interest rates, inflation, investment earnings, mortality rates, and employee turnover. The actuary will also assist the Board in setting the discount rate. These actuarial assumptions are reviewed every four years during the actuarial experience study, and they are used as inputs for the asset allocation study.

Custodian

The Board selects the Trust's custodian with the primary function to hold custody of all the assets of the Trust, except for commingled funds, mutual funds, and certain funds of one as appropriate, which may be held elsewhere in accordance with applicable law and the investment's requirements. The custodian will also calculate investment performance and benchmark comparisons.

Investment Strategies (Internal and External)

Staff has the responsibility for managing the Trust in the best interest of the Beneficiaries by making prudent investment decisions for investment strategies and reporting investment results to

the Board. Staff will both internally manage assets and elect to use external management when appropriate. External management in public asset classes will be through using External Advisors where discretion for managing assets is maintained by Staff. Private asset classes (private market investments) will use external managers that may exercise full investment discretion with respect to buying, managing and selling assets within the terms of the applicable securities and the approved guidelines to achieve the pertinent objectives. In the IPS when the term, Investment Managers is used, it is intended to include both internal and external managers unless otherwise specified. Investment Managers and External Advisors shall act as fiduciaries of the Trust and exercise prudence, care, skill, and due diligence while selecting investments to buy or sell for the Trust. Investment Managers and External Advisors are responsible for adhering to the written guidelines and following all applicable laws, rules, and regulations. Staff will monitor all Investment Managers and External Advisors for compliance with the IPS and strategy investment guidelines.

External Advisors/Select Pool

In public asset classes, External Advisors will be selected by the appropriate ACIC and procurement method to be in a Select Pool and Staff will recommend External Advisors from the Select Pool to fund. Funding, de-funding, or removal of an External Advisor in the Select Pool will be recommended by Staff for action by the CIO, in consultation with the Executive Director. Staff will report to the Board and IAC the status of funding and report significant changes to the Board and IAC at least quarterly.

Emerging Managers

In selecting managers, advisors, consultants, and other financial service providers, the Board shall make a good faith effort to evaluate qualified emerging firms as candidates to award contracts to or acquire services from when acquiring private financial services as set forth in Texas Government Code § 815.301 (g), (h), and (i). An emerging fund manager is defined as a private professional investment manager with assets under management of not more than \$2 billion. ERS has established an emerging manager program to find smaller managers that can benefit the Trust by enhancing risk-adjusted returns, net of fees.

Staff have determined that, over the long term, inclusion of emerging managers as part of external investment management should enhance and diversify the Trust's expected investment returns, serving to complement the Trust's internal investment management. ERS emerging manager program is integrated within each asset class. ERS seeks to provide open access to all managers and ensure an inclusive approach when investing the Trusts' capital. ERS' philosophy is that broadening the investment opportunity set of external managers to include smaller, newer, and diverse managers is expected to have many benefits for the Trust.

- First and foremost, smaller managers have proven in research to deliver competitive risk-adjusted investment returns.
- Second, employee-owned firms tend to have a stronger alignment of interest with investors.
- Third, these entrepreneurial managers can provide ERS with unique investment strategies and diversity of thought.
- Fourth, this program can provide the Trust with long-term access to the next generation of talent. Staff will report to the Board how the emerging manager program has fulfilled the expected benefits to the Trust.

Accounts Payable

NEPC has reviewed the Accounts Payable Invoice Routing and Approval Overview and has concluded that appropriate procedures and processes are in place to execute on operating the System. Of note, the process includes citations of Texas Government Code Sections 2251.025–

2251.026 relating to payment by a state agency to a vendor for goods and services. The accounts payable process is audited by the State Auditor's Office for compliance with the Prompt Payment Act Texas Government Code Sections 403.071, 2155.321, 2155.322 – 2155.326, 2155.327, (b). We believe that a robust process, procedure and re-evaluation mechanism is in place.

Enhancement Recommendations:

NEPC believes it may be useful for ERS Texas to explicitly define the role of the Chief Investment Officer in the Governance section of the IPS. Currently, the CIO is referenced in terms of supervisory authority over the Investment Staff.

Section 5. Review of Investment Manager Selection and Monitoring Process

Activities Completed:

To gain a complete overview of the Fund's Investment Manager Selection and Monitoring Process, NEPC reviewed the IPS along with the Guidelines and SOPs, where available, for specific asset classes. SOPs do not appear to currently exist for the Fixed Income program and Global Equity program.

Standard of Comparison:

When reviewing ERS' investment manager selection process, NEPC analyzed the investment processes that are currently described in the Standard Operating Procedure documents of each of the asset classes. NEPC was looking for processes that exhibited the following:

- A consistent and comprehensive process that members of the team are trained to follow which describes the steps for investment selection and monitoring
- Addresses ethics and conflicts of interest that may present themselves
- Detailed investment selection criteria that investment manager candidates must meet in order to be approved for funding
- A review of the contractual agreements conducted by legal experts
- An approval process where the investments are presented to a committee
- And a monitoring process that strives to hold investment managers accountable to the agreements they made with the Retirement System

NEPC reviewed the recommended resource provided by the Government Finance Officers Association regarding "Selecting Third-Party Investment Professionals for Pension Fund Asset". While this resource was useful and comprehensive, NEPC recognizes that there is some understandable variability in investment manager selection and monitoring process between asset classes.

Findings:

ERS' IPS states that the Board is responsible for making long-term asset allocation decisions and that ERS Staff is tasked with implementation through prudent and sound strategic decisions. For public asset classes, Staff may select "External Advisors" where discretion for management of assets is maintained by Staff or "External Managers" in private investments who have discretion over the management of assets invested in the private markets. For private asset classes, Staff will generally use External Managers who have full investment discretion with respect to buying, managing, and selling assets in accordance with limited partnership agreements or similar contracts that are considered securities under Texas Law. The IPS states that the Board should also make a good-faith

effort to evaluate qualified emerging firms, defined as a fund manager with assets under management of under \$2 billion.

Staff is responsible for selecting investment managers with the Board providing an oversight role, supported by recommendations from Staff, independent external advisors that are appointed by the Board (Investment Advisory Committee) and consultants hired by the Board. The Board retains responsibility for approving alternative investments over 0.6% of the total market value of the Retirement System's assets as reported in the most recent ERS CAFR pursuant to Texas Government Code Section 815.3016.

The IPS describes the Board's investment philosophy. This guides the Board's asset allocation decisions as well as informs Staff as to the Board's priorities when making investment recommendations. These philosophy statements place emphasis on making long-term asset allocation decisions that are geared towards meeting the Trusts' liabilities by achieving its long-term return goals, balancing portfolio risk through diversification to construct a portfolio that is positioned for various economic conditions, and the management of costs. These philosophy statements are taken into consideration in the asset class program guidelines and asset class standard operating procedure ("SOP") documents that were reviewed.

Public Asset Classes Manager Selection

The asset classes of Global Public Equity and Fixed Income are managed both internally and through external advisors. The program guidelines for Global Public Equity explain that the Global Public Equity Internal Investment Committee has the authority to review and approve additions and deletions from the "Select Pool". External Advisors are recommended to addition or deletion from this Select Pool by Staff after going through a thorough due diligence process and procurement. This starts with the identification of an investment strategy that might complement the internal portfolios. This is followed by the issuance of a Request for Proposal (RFP), with respondents going through a multi-staged investment and operational due diligence process. Staff then recommends respondents who have completed this process to the ACIC for approval of addition to the Select Pool with funding decisions based on Staff recommendations and authorized by the CIO in consultation with the Executive Director.

An interesting aspect of this investment process is that it includes the issuance of a formal RFP. This is mandated by Title 10, Subtitle D of the Texas Government Code, and conversations with Staff indicates that there may be advantages to seeking procurement exemptions similar to the ones at peer public funds to the extent consistent with Texas Government Code Section 815.106. They note that the RFP process can take up to a year due to the universe of respondents to the RFP, during which the investment opportunity that was identified may mature and become unattractive for new investment. In addition, pursuant to ERS's Sunset Review and under state procurement guidance (see the Procurement and Contract Management Guide), contracts should be periodically resolicited, regardless of the performance of the investment manager under the current relationship. Ideally, these particular contracts would be evergreen and only resolicited for poor performance, which would be evaluated regularly by Staff.

Alternative Asset Classes

The asset class program guidelines for alternative asset classes each describe the performance objectives and high-level criteria that prospective investments should meet. As stated at the beginning of the IPS and repeated in each of the program guidelines, the performance objective is to "generate a reasonable risk-adjusted return while maintaining prudent diversification of specific investments." The guidelines go on to set out the eligible investment types and state that

prospective investments must be of institutional quality, defined as being “of a quality whereby the investment would be considered acceptable by other prudent institutional investors.” Finally, the program guidelines generally go into specifics as to the definition of different strategies or portfolios and explaining how the different strategies fit within the Trust’s overall portfolio.

The asset class SOP documents go into varying levels of detail regarding the sourcing process and the criteria that prospective investment managers are judged against with the Hedge Fund SOP providing the most detail. The Hedge Fund SOP details a step-by-step process with increasing levels of scrutiny at each level and through which potential new investments must go through in order to be approved to be included in the portfolio. This starts by satisfying an informal list of criteria before proceeding to the due diligence stage of the process. These criteria include portfolio fit, the hedge fund consultant’s score of the investment, registration on ERS’ external website, track record, institutional infrastructure, fee flexibility, and passing an initial legal review by ERS’ OGC staff. The SOP goes on to state that while this list of criteria is not all encompassing, most hedge fund managers do not make it to “Phase I” of the process given the criteria noted. Phase II of the process demands more information from the hedge fund manager, an onsite visit by ERS Staff, and Hedge Fund Team approval to be able to move the investment to Phase III. Hedge Fund investments in Phase III are presented to the Internal Investment Committee for approval before the investment can be funded.

The Infrastructure SOP and Private Equity SOP documents list similar criteria with some differences including adding that new investments should fit within Annual Strategic and Tactical Plans and that the investment professionals at the investment managers have relevant experience, complementary skills, and appropriate tenure. Evidence from interviews with Staff shows that while the Infrastructure, Private Equity, and Real Estate SOP documents are not as detailed, these asset classes generally follow a similar investment process as Hedge Funds with some differences to account for the unique natures of each asset class. Differences in the investment processes between the asset classes is common among institutional investors.

At a high level, it is up to Staff to identify investment opportunities and investment managers that will fit within the ERS portfolio by providing appropriate diversification while generating a reasonable risk-adjusted return. Thus, if multiple investment managers are being considered, Staff is responsible for choosing the manager that is most aligned with the Retirement System’s investment philosophy. Similarly, Staff may determine that an investment manager is no longer aligned with the Retirement System’s investment philosophy or is no longer providing the kind of returns or diversification that was intended, thus causing Staff to replace that manager.

The IPS states that Staff and the General Plan Investment Consultant will “monitor the performance of each investment strategy quarterly, while retaining a long-term focus.” The IPS lists several factors that Staff should look out for as being possible triggers for recommending termination. These include but are not limited to:

- a) Substantial changes in assets under management (external advisors);
- b) Material changes to policy and objectives as previously approved by the Board;
- c) Performance relative to assumed risk (benchmark comparison over five years);
- d) Investment holdings consistent with style;
- e) Stability of the organization and personnel turnover; and
- f) Performance relative to peer group over three years.

The Program Guidelines and SOP documents also tend to include other preconditions that investments should meet to qualify for inclusion in the portfolio. Subsequent violations of those preconditions could result in a recommendation for termination.

For Investment Managers, potential conflicts of Interest are reviewed by Investment Staff and OGC. Where applicable, the ERS Operational Due Diligence Group reviews investment managers for satisfactory compliance and programs and any legal or ethics issues. Investment Compliance monitors investment activity in connection with prohibited securities lists. Potential conflicts of interest with investment managers are generally highlighted through the due diligence process and during the ACIC meetings if applicable. Board Members complete a questionnaire and affirmation affirming compliance with the ERS Code of Ethics. They are required to disclose any outside business affiliations or board directorships that could be an actual or perceived conflict with ERS. Those disclosures are reviewed by the CIO and Investment Compliance. The Board Members are not members of any ERS investment committees and have delegated such authority to investment staff. The Board receives a quarterly litigation report listing all cases of which staff is aware where ERS is a party to the case or may be affected by the outcome.

Staff has responsibility for implementing the IPS, thus Staff is initially responsible for developing and reviewing investment consultant and/or manager contracts. For private funds, Investment Staff will typically go through the process of sourcing the investments and the initial due diligence. Concurrently, ERS OGC Staff review the legal documents of the investment at the outset for potential “fatal flaws.” As the prospective investment progresses through the diligence and approval process, the Investment Staff and Legal typically work together to negotiate the terms of the investment. Upon final agreement between Investment Staff, Legal Staff, and the investment manager over the terms, ERS OGC circulates a closing memo explaining the review and agreed upon terms. Staff generally has authority to fund investments, including with new investment managers, up to limits that are set out in the IPS and the Program Guidelines.

Investment Consultant contracts follow a slightly different process since the Board provides the final approval for the engagement or re-engagement of investment consultants. The process starts with Staff issuing a Request for Proposals (RFPs) for the investment consultant contract in question. ERS’ Office of Procurement and Contract Oversight evaluates the RFP respondents on a pass/fail basis on a number of minimum requirements. Respondents who make it to the next stage are evaluated based on the price proposal, their qualifications, and proposed services/capabilities. This stage is handled by individuals from ERS’ Investments, Strategic Initiatives, and the Office of the General Counsel. Provided the respondents pass this stage, the Office of the General Counsel is responsible for drafting and negotiating the contract and verifying that it meets ERS’ requirements. Staff then makes a recommendation to the Board of Trustees which considers staff’s recommendation in a public meeting and then votes on the contract award.

Performance is monitored on an ongoing basis at the asset class level and at the Trust level. It is reviewed through regularly scheduled meetings of Investment Staff, Investment Directors and the Risk Committee. It is reported to the Board monthly and quarterly through reporting and Board Meeting presentations.

According to the IPS, primary responsibility for monitoring investment performance falls on Staff. Staff is tasked with reporting performance of individual and overall fund performance to the Board in monthly and quarterly performance reports and Board Meeting presentations. The IPS further states that Staff must provide a performance evaluation on a quarterly basis where rates of return are compared with

- a) The risk and return of an appropriate market index
- b) The return of an appropriate style benchmark, where applicable; and
- c) The returns of a universe of comparable investment strategies.

The Trust’s performance is calculated by the General Plan Consultant, and Staff is tasked with providing a summary explaining the Trust’s performance in the context of the financial market developments over the periods considered. Performance is measured against the benchmarks that are listed in the IPS in Table 4. Each asset class director monitors performance in relation to their respective benchmarks in collaboration with the CIO. The custodian also calculates investment performance and benchmark comparisons. The following benchmarks are listed in Table 4 of the IPS:

Illustration 5.1

Asset Class	Benchmark
Public Equity	MSCI ACWI IMI
Private Equity	Median Wilshire Associates Trust Universe Comparison Service’s (TUCS) Total Private Equity Return of Master Trusts – Public: Plans > \$5 billion
Global Credit	Bloomberg Barclays US HY 2% Issuer Capped Cash Pay
Public & Private Real Estate	Private: 75% NCREIF – ODCE; Public: 25% FTSE EPRA/NAREIT
Private Infrastructure	CPI + 400 bps
Opportunistic Credit	S&P LSTA Leveraged Loan Index + 150 bps
Fixed Income – Rates	Bloomberg Barclays Intermediate Treasury Index
Hedge Funds/Absolute Return	U.S. 3-Month Treasury Bill + 350 bps
Cash	91 Day Treasury Bill

Monthly and Quarterly Investment Reports are provided to Board Members for their review. These reports have narrative and graphic elements. There are also quarterly Board meetings and presentations from the CIO and General consultant. Gross and Net of fee performance is provided monthly in the monthly Investment Summary reports provided to the Board.

Enhancement Recommendations:

- Reviewing the Investment and Monitoring Processes that are detailed in the SOP documents and formulating a standard that can be more easily followed across all asset classes should be considered. As noted in Section 1 of this Report, the SOP documents that were provided contain varying levels of detail regarding the criteria that should be applied to investment opportunities as well as the general workflow process that is to be followed. While the processes and criteria were explained to be generally similar, this was not exhibited in the SOP documents. More standardization should be considered while also allowing for the uniqueness of the asset classes. This is similarly true for investment monitoring process with emphasis being placed on changes at the investment managers being reviewed in addition to simple aggregation of performance metrics.
- Recommend reviewing whether the current RFP process for public equity investment managers has caused ERS to miss investment opportunities and to measure missed investment returns. This recommendation is tied to the observation in Section 1 that Procurement constraints may hamper ERS’ operational flexibility. Conversations with Staff indicate that the RFP process for Public Equity external advisors is lengthy due to the universe of respondents to the RFPs issued

by ERS, and can cause ERS to miss out on specific investment strategies as they can mature in the time it takes. Staff highlights that investment managers in private asset classes are not required to go through a similar process because those are considered to be an investment in securities under the law, as opposed to being a contract for goods and services when contracting. A change in statute to allow for a more informal process could lead to a nimbler investment strategy implementation. NEPC recommends that Staff analyze past RFP searches for investment managers for newly identified investment strategies and measure lost returns to the Retirement System from the beginning of the RFP process to eventual funding of an investment strategy. However, changes to the process appear to require legislative approval.

Section 6. Technical Summary

Work Plan

As the general investment consultant for the Employees Retirement System of Texas, NEPC has been engaged by ERS as an independent firm to help the Fund fulfill the requirements of Texas Government Code §802.109 which requires Texas public retirement systems with at least \$100 million in assets to complete an Investment Practices and Performance Evaluation, once every 3 years.

The scope of work includes:

- Executive Summary
- Investment Policy Statement Analysis and Compliance
- Asset Allocation Review
- Process for Determining Target Allocations
- Expected Risk & Return Summary
- Appropriateness of Selection and Valuation Methodologies of Alternative and Illiquid Assets
- Consideration and Incorporation of Future Cash Flow and Liquidity Needs
- Review of the Appropriateness of Investment Fees and Commissions Paid
- Review of Governance Processes Related to Investment Activities
- Review of Investment Manager Selection and Monitoring Process
- Technical Summary

Illustration 6.1
Timeline

Date	Tasks	Responsible Party
October Week of the 14th Week of the 21st Week of the 28th	Requirements Gathering Resource Gathering Document Requirements List	NEPC/ERS Texas Staff NEPC NEPC/ERS Texas Staff
November 1st-22nd Week of the 25th Week of the 25th	Receive Documents Review Document Package Confirm Trade Cost Report or Provider	NEPC NEPC NEPC
December Week of the 2nd Week of the 9th Month of December	Analysis & Additional Document Requests/Follow-Ups ERS Texas On-Site Visit Deliverable Construction	NEPC NEPC/ERS Texas Staff NEPC
January 15th 20th 27th 29th	Initial Draft of Report Initial Comments Provided ERS Texas On-Site Visit Second Draft for Executive Office Review	NEPC ERS Texas Staff NEPC/ERS Texas Staff NEPC
February 7th 14th	Final Comments Provided Submission of Finalized Draft	ERS Texas Staff NEPC
March 11th	Presentation of Report to the Board	ERS Texas Staff

Company Overview

NEPC has been providing investment consulting services since 1986. We are one of the largest independent investment consulting firms in the industry. We advise 376 retainer clients with \$1.1 trillion in assets¹. Today, the firm has formal offices in Atlanta, Boston, Charlotte, Chicago, Detroit, Las Vegas, Portland and San Francisco. Our growth is attributed to the high quality results our clients have achieved and our high service model. We have a dedicated public fund team that advises 69 public funds representing \$633 billion in assets. NEPC is a Limited Liability Company (LLC).

Since inception in 1986, NEPC has been 100% employee-owned and is therefore neither an affiliate nor a subsidiary of any organization. NEPC's equity plan is designed to ensure the continued stability of our professional staff by allowing future employees to share in the profits of the company and in the long-term appreciation of its equity. Today, ownership is shared among 41 Partners; and no single Partner owns more than 8% of the firm. Individual ownership percentages are not disclosed.

NEPC receives 100% of its revenue exclusively from providing advisory consulting and discretionary investment services to our clients, with approximately 85% of our revenue coming from traditional, advisory consulting services and the remaining 15% coming from discretionary investment services. NEPC does not have any conflicts of interest with ERS and does not, directly or indirectly, manage assets or select managers for ERS.

Ownership of NEPC, LLC

Name of NEPC, LLC Owner	Owner Since
Richard M. Charlton , <i>Chairman Emeritus</i>	1986
Michael P. Manning , <i>CFA, CAIA, Managing Partner</i>	1998
Lenia Ascenso , <i>Partner</i>	2019
Samuel M. Austin, III , <i>Partner</i>	2017
William Y. Bogle , <i>Partner, Chief Compliance Officer</i>	1993
Ross A. Bremen , <i>CFA, Partner</i>	2008
Timothy R. Bruce , <i>Partner, Director of Portfolio Construction</i>	2014
Michael D. Cairns , <i>CEBS, Partner</i>	2011
Steven F. Charlton , <i>CFA, Director of Consulting Services</i>	2001
Kristen Colvin , <i>CAIA, Partner</i>	2019
KC Connors , <i>CFA, CAIA, Partner</i>	2010
Brian S. Donoghue , <i>Partner</i>	2013
John M. Elliot , <i>Partner</i>	2006
Sean W. B. Gill , <i>CFA, CAIA, Partner, Director of Private Markets Research</i>	2006
Kristi Hanson , <i>CFA, Partner, Director of Taxable Research</i>	2017
Karen Harding , <i>CFA, Partner</i>	2017
Rhett Humphreys , <i>CFA, Partner</i>	2006
Paul R. Kenney, Jr. , <i>CFA, Partner</i>	2005
Christopher J. Klapinsky , <i>CFA, Partner, Director of Portfolio Strategy</i>	2008
John R. Krimmel , <i>CPA, CFA, Partner</i>	2012
Catherine M. Konicki , <i>CFA, CAIA, Partner</i>	1993
Christopher A. Levell , <i>ASA, CFA, CAIA, Partner</i>	2007
Kevin M. Leonard , <i>Partner</i>	2011
Christine A. Loughlin , <i>CFA, CAIA, Partner</i>	2007
Allan C. Martin , <i>Partner</i>	2005
Timothy F. McCusker , <i>CAIA, CFA, FSA, Chief Investment Officer</i>	2011
David W. Moore , <i>Partner</i>	2010
Douglas W. Moseley , <i>Partner</i>	2007
Phillip Nelson , <i>CFA, Partner, Director of Asset Allocation</i>	2018
Kristine Pelletier , <i>Partner</i>	2019
Scott F. Perry , <i>CAIA, Partner</i>	2012
James E. Reichert , <i>CFA, Partner</i>	2013
Kristin M. Reynolds , <i>CFA, CAIA, Partner</i>	2012
Brian Roberts , <i>CAIA, Partner</i>	2018
Jay E. Roney , <i>CTP, Partner</i>	2007
Sarah Samuels , <i>Partner, Director of Public Markets Research</i>	2019
Neil N. Sheth , <i>Partner, Director of Alternatives Research</i>	2012
Bradley S. Smith , <i>CFA, CEBS, Partner</i>	2012
Carolyn Smith , <i>Partner</i>	2008
Michael P. Sullivan , <i>Partner</i>	2017
Craig A. Svendsen , <i>CFA, Partner</i>	2009

Experience of Review Team that Prepared Evaluation Report for ERS Texas



Samuel M. Austin, III
Partner, Lead Consultant for Texas ERS

Sam Austin brings over 30 years of investment experience to the firm's Public Fund Consulting Practice. Sam has offered consulting advice to public funds and corporate clients for 26 years. He is the Co-Chair of NEPC's Diverse Manager Committee and a member of the firm's Impact Investing Committee. Prior to joining the Partnership at NEPC in 2017, Sam was a Senior Vice President at FIS Group for five years, where he advised pension clients on the portion of their asset allocation dedicated to emerging managers. Sam contributed to manager selection decisions as a Voting Member of the Investment Committee at FIS. Previously, Sam worked for 10 years at Virtus Investment Partners where he held the position of Executive Managing Director. As a Member of the Virtus Executive Committee, reporting to the CEO, he was a key participant in the strategic planning and implementation for the spin-out of multiple boutique money management subsidiaries from Phoenix Insurance. Earlier in his career, Sam was a Principal at Barclays Global Investors. He also served as a Principal and Portfolio Strategist for Quantitative Equities at Bankers Trust Company in New York.

Sam was the founding President of the New York Chapter of the National Association of Securities Professionals (NASP-NY), where he created the NASP-NY Trustee Education Seminar in 1994. His initiative to launch the NASP Finance and Scholastic Training Track ("FAST Track") Program in New York has been adopted by other local chapters of NASP around the country and has introduced hundreds of inner-city high school students to careers in banking, finance and asset management. Sam was inducted into the NASP-NY Wall Street Hall of Fame in 2013. Outside of his vocation, Mr. Austin also serves as Executive Pastor of his local church in the San Francisco Bay Area. Sam earned his M.B.A. degree in Finance from the Questrom School of Business at Boston University and a Bachelor of Science degree from Boston University.



Timothy R. Bruce
Partner, Director of Portfolio Construction

Tim joined NEPC in 2008. Tim works with NEPC's clients to solve portfolio construction and asset class implementation questions. Tim and his team work across all NEPC research to incorporate the Firm's best ideas in public and private markets. The Portfolio Construction Team works in tandem with clients to analyze their exposures through a quantitative and qualitative lens that is specific to the portfolio goals and objectives of each client. Outside of his formal research responsibilities, Tim provides consulting services for both traditional and non-traditional asset classes of various public, corporate, Taft-Hartley and endowment/foundation clients.

As a research team leader, Tim is a member of multiple investment committees at NEPC. A frequent conference speaker, Tim has authored multiple white papers across a broad range of asset classes and investment strategies.

Prior to joining NEPC, Tim was an Investment Analyst for the \$12 billion dollar Partners Healthcare Investment Office. At Partners, Tim was responsible for conducting investment research and analysis for the institutions' endowment and pension fund. He specialized in foreign equity and hedge fund investments and was accountable for foreign equity, hedge fund allocations, portfolio construction and investment selection.

Tim received his M.B.A. from The University of Chicago Booth School of Business, with concentrations in Finance and Strategic Management. Tim received his B.A. in Economics from Brown University.



John R. Krimmel, CPA, CFA
Partner

John's investment career began in 1990, and he joined NEPC in 2010. At NEPC, John assists clients with the development of investment policies and objectives, the evaluation and selection of investment managers, and the measurement and analysis of investment performance. He is also a member of the Manager Diversity Program Advisory Committee. Prior to NEPC, John was a Senior Consultant and Senior Vice President at Callan Associates, with broad responsibility in all facets of client management including public, corporate and endowment and foundation clientele. While at Callan, John was a member of its Manager Research Committee and Alternatives Review Committee.

Prior to Callan, John was the Chief Investment Officer at the Kentucky Retirement System and at the State Universities Retirement System of Illinois. Early in his career he worked in Public Accounting at Deloitte and Touche, LLP. He served in the U.S. Coast Guard and was awarded a Commandant of the Coast Guard's Letter of Commendation. John has an M.S. in Accountancy from the University of Illinois and a B.S. in Accounting from Millikin University. John is a Certified Public Accountant and holds the Chartered Financial Analyst designation.



William Y. Bogle, IV
Partner, Chief Compliance Officer

Bill joined NEPC at its inception in January 1986. Today he is a Partner in the firm with two areas of responsibility: Compliance and Operational Due Diligence. He is a member of the firm's Management Group and Alternative Asset Committee.

As NEPC's Chief Compliance Officer, Bill is charged with monitoring external compliance requirements and developing internal control procedures. Responsibilities include interaction with regulators, client contracts, our Code of Ethics, confidentiality agreements and our Privacy Policy, employee personal trading, and gift/entertainment reporting.

Regarding Operational Due Diligence, Bill manages a team that evaluates hedge fund operations. This requires in-depth analysis of hedge fund managers to assess all facets of their trading, risk management, compliance and back office procedures. He meets with managers on a regular basis and attends industry conferences sponsored by organizations such as the Boston Hedge Fund Group and the Hedge Fund Business Operations Association.

For many years Bill managed NEPC's own internal operations, including our performance measurement and client reporting process. This entailed monitoring all the investment managers and custodian banks employed by our clients and managing production of our quarterly performance reports. He was our liaison with State Street (formerly Deutsche Bank and Bankers Trust Company) for the ICC and was the chairman of the ICC Product Development Committee. For three years Bill assisted with CIPM program development as a consultant to the CFA Institute. Prior to joining NEPC, he worked as an Analyst for Berents Capital Management in Boston and for the

Hartford Insurance Group. Bill received his M.B.A. in Finance from Babson College and his B.A. in Mathematics from Bates College.



Kevin Lau-Hansen
Senior Operational Due Diligence Analyst

Kevin joined NEPC in 2014 as an Analyst in NEPC's Operational Due Diligence group. At NEPC, Kevin assists with in-depth analysis of hedge funds including all aspects of a fund's infrastructure, trading and reconciliation, risk management, compliance, and management.

Prior to NEPC, Kevin was an Associate at Saigon Asset Management in Vietnam. In this capacity, he coordinated all aspects of Investor Relations for a \$90mn alternative asset manager, including strategy and special projects.

Kevin earned his B.A. in International Relations at Connecticut College. He is currently pursuing the CFA (Chartered Financial Analyst) designation.



Michael Malchenko
Senior Client Specialist

Michael joined NEPC in 2014 and is responsible for supporting the firm's public fund clients with investment structure, market reviews, manager searches, performance measurement, asset allocation studies, and technical projects.

Prior to NEPC, Michael worked at State Street as an Assistant Vice President in the firm's investment analytics department. Michael managed investment relationships for public and private pension plan sponsors at and was responsible for working directly with the country's largest pension funds in building portfolio management and oversight tools.

Michael earned a H.B.A. from the University of Toronto. He is currently pursuing the Chartered Financial Analyst (CFA) and Chartered Alternative Investments Analyst (CAIA) designations.



Tony Ferrara, CAIA
Consultant

Tony assists clients with manager searches, performance measurement, asset allocation studies, and technical projects. Tony is a member of NEPC's Public Fund

Practice Group and is based out of our Redwood City office. Prior to joining NEPC in 2010, Tony was a Senior Consulting Associate at Verus Investments (formerly Wurts & Associates, Institutional Investment Consultants). At Verus Investments, Tony was the lead conductor of all asset-liability studies and ran and presented asset-allocation studies. Tony developed investment policy statements for clients and analyzed the performance of the investment managers. He also created, presented and developed educational presentations on various asset classes, capital market assumptions and the latest investment strategies. Prior to joining Verus Investments in 2006, Tony was employed as a Financial Advisor at Waddell & Reed Inc.

Tony earned his B.S. in Finance from San Jose State University. He holds the Chartered Alternative Investment Analyst (CAIA) designation.

Firm Qualifications

NEPC, LLC (“NEPC”) has been providing investment consulting services since 1986. NEPC was founded on three main principles: strive to maintain independence, provide proactive counsel in an attempt to help our clients exceed their goals and objectives, and service our clients with seasoned professionals.

The commitment to our clients and guiding principles remains intact, recognizing that our efforts can enhance benefits for the millions of beneficiaries in our care. Our focus has led to favorable client satisfaction ratings relative to our nine largest competitors.

NEPC is one of the largest independent investment consulting firms in the industry. We have 292 employees and advise 376 retainer clients with \$1.1 trillion in assets². Our growth is attributed to the high quality results our clients have achieved and our high service model.

We have a dedicated public fund team that advises 69 public funds representing \$633 billion in assets³. Our dedicated Public Fund Consulting Team has 15 Consultants and 7 Consulting Analysts nationally, with an average of 21 years of experience working with, and assisting, public fund clients with their unique challenges. This team has deep knowledge of state regulations, asset allocation, asset liability hedging as well as a proactive strategic approach, which understands the nuances specific to the public fund marketplace.

NEPC and our clients are award winning. NEPC’s public fund clients have received numerous recognitions/awards over the years, including when two public fund clients won CIO’s Industry Innovation Awards in 2016, when three public fund clients won Institutional Investor’s Investor Intelligence Awards in 2016, when ten public fund clients were named on Trusted Insight’s Top 30 Pension Fund Chief Investment Officers List in 2016, when one public fund client won two of CIO’s Industry Innovation Awards in 2015, when three public fund clients were named on CIO Magazine’s Power 100 List in 2015, and when three public fund clients won Institutional Investor’s Investor Intelligence Awards in 2015.

² As of 6/30/2019, includes 59 clients with discretionary assets of \$27.9 billion.

³ As of 6/30/2019

Appendix A
Institutional Investors ERS Considers as Peers
Source: Betty Martin, ERS, 12/18/2019

Incentive Compensation Plan
ICP Study - Methodology

ERS

Peer Group

1. California Public Employees' Retirement System	11. School Employees Retirement System of Ohio
2. California State Teachers Retirement System	12. State Teachers Retirement System of Ohio
3. Colorado Public Employees' Retirement Association	13. Oregon Public Employees Retirement Fund
4. State Board of Administration of Florida	14. South Dakota Retirement System
5. Employees' Retirement System of Georgia	15. Tennessee Consolidated Retirement System
6. Indiana Public Retirement System	16. Texas Permanent School Fund
7. Massachusetts Pension Reserves Investment Management Board	17. Teacher Retirement System of Texas
8. Maryland State Retirement and Pension System	18. Texas Treasury Safekeeping Trust Company
9. Michigan Office of Retirement Services	19. Virginia Retirement System
10. Ohio Public Employees Retirement System	20. State of Wisconsin Investment Board

Agenda Item 7.1 - Board of Trustees Meeting, May 22, 2019

- CalPERS website:
<https://www.calpers.ca.gov/page/about/board/board-members>

- CalSTRS website:
<https://www.calstrs.com/board-members>

- Colorado PERA website:
<https://www.copera.org/about/board-trustees>

- State Board of Administration of Florida:
<https://www.sbafla.com/fsb/Trustees,CouncilsCommittees/Trustees.aspx>
<https://www.sbafla.com/fsb/Trustees,CouncilsCommittees/InvestmentAdvisoryCouncil.aspx>

- Employees' Retirement System of Georgia
<https://www.ers.ga.gov/post/ers-0>
<https://www.ers.ga.gov/post/psers-0>

- Indiana Public Retirement System
https://www.in.gov/inprs/board_of_trustees.htm

- Massachusetts Pension Reserves Investment Management Board
<http://www.mapension.com/about-prim/prim-board/>
<http://www.mapension.com/about-prim/prim-advisory-committees/>

- Maryland State Retirement & Pension System
<https://sra.maryland.gov/board-trustees>
<https://sra.maryland.gov/public-advisors-investment-committee>
- Michigan Office of Retirement Services
https://www.michigan.gov/orsschools/0,4653,7-206-47004_47254---,00.html
- Ohio Public Employees Retirement System
<https://www.opers.org/about/board/index.shtml>
- School Employees Retirement System of Ohio
<https://www.ohsers.org/about-sers/board-of-trustees/>
- State Teachers Retirement System of Ohio
<https://www.strsoh.org/aboutus/board/members.html>
- Oregon Public Employees Retirement Fund
<https://www.oregon.gov/PERS/Pages/Board/PERS-Board-Members.aspx>
- South Dakota Retirement System
<https://sdrs.sd.gov/about/trustees/currentboard.aspx>
- Tennessee Consolidated Retirement System
<https://treasury.tn.gov/Retirement/Boards-and-Governance/TCRS-Board-of-Trustees>
- Texas Permanent School Fund
https://tea.texas.gov/About_TEA/Leadership/State_Board_of_Education/S_BOE_Meetings/SBOE_Committees
https://tea.texas.gov/About_TEA/Leadership/State_Board_of_Education/S_BOE_Board_Members
- Teacher Retirement System of Texas
https://www.trs.texas.gov/Pages/board_know_your_trustees.aspx
- Texas Treasury Safekeeping Trust Company
<https://ttstc.org/about/advisoryboard/index.php>
- Virginia Retirement System
<https://www.varetire.org/about/board/trustees.asp>
- State of Wisconsin Investment Board
<https://www.swib.state.wi.us/board-of-trustees>