CLIFFWATER

INVESTMENT ADVISORY SERVICES

Marina Towers
4640 Admiralty Way, Suite 1101
Marina del Rey, CA 90292
310.448.5000 ph
310.448.5001 fx

Texas County & District Retirement System
Texas Pension Review Board
Investment Practices & Performance Evaluations

April 2023

TABLE OF CONTENTS

Texas Pension Review Board
Investment Practices and Performance Evaluations

Texas County & District Retirement System
As of December 31, 2022

Introduction:
When evaluating TCDRS' investment practices, strategy and performance, it is important to recognize that the Texas County & District Retirement System (TCDRS) has unique features that keep the system financially sound and help manage risk. TCDRS partners with more than 830 Texas counties and governmental districts to provide retirement, disability and survivor benefits to more than 345,000 Texans.

TCDRS is a **savings-based** or **cash-balance** plan, ***not*** a traditional defined benefit plan. Employees save for their own retirement over the length of their careers. At retirement, TCDRS benefits are based on the employee's final savings balance and employer matching. This feature makes costs more predictable for participating employers.

TCDRS is not a one-size-fits-all system. Each employer, regardless of how large or small, maintains its own customized plan of retirement benefits. Employers can choose how much their employees save for retirement, their level of employer matching, and their plan's retirement eligibility requirements. Most importantly, employers have the flexibility and local control to adjust their benefits each year based on their needs and budgets. By changing the amount employees are saving or their employer matching rate, an employer can change how much they need to contribute to fund their benefits. This level of flexibility is not standard in most traditional pension plans. This design allows employers to share investment risk with their employees.

While every employer plan in TCDRS is different, they have one thing in common: They are all responsibly funded. Employers must pay 100% of their required contribution rate. There are no contribution holidays. TCDRS receives no funding from the State of Texas. If rates rise, employers may lower benefits for immediate budget relief. The system has other built-in tools to help manage risk, including a reserves fund that is currently over $5.5 billion as of Dec. 31, 2021. The reserves fund can be used to offset future adverse plan experience. In addition, more than one-third of employers make additional contributions to their plans to offset future adverse experience and to create budget stability.

(1) Analysis of any investment policy or strategic investment plan adopted by the retirement system and the retirement system's compliance with that policy or plan.

The Texas County & District Retirement System ("TCDRS" or the "System") maintains a written investment policy statement (IPS) which is available to the public on tcdrs.org. It is established by the TCDRS Board of Trustees (the "Board"). The Policy provides a foundation from which to oversee the management of the investment of System assets. The Policy is intended to allow for sufficient flexibility to capture investment opportunities yet provide parameters to ensure prudence and care in the management of the investment program.

The Policy documents TCDRS' investment objectives, policies, guidelines and procedures. It also outlines the duties and responsibilities and provides guidance to the fiduciaries of the System including the Board of Trustees, individual members of the Board ("Trustees"), the Investment Officer, staff professionals, investment consultants, performance measurement analysts, external investment managers, custodians, securities lending agents and others who exercise discretionary authority or control over the management or disposition of System assets.

In addition, the Policy states the standards and disciplines adopted so that Trustees can effectively evaluate the performance of the System staff, investment managers, investment consultants and others. This Policy also serves as compliance with Section 845.301(f) of the TCDRS Act, which requires that the Board establish written investment objectives concerning the investment of assets of the System.

The IPS, attached as Exhibit 1, contains the major categories typically included in an institutional quality investment policy. The policy is clearly written and contains measurable objectives for the asset allocation, asset classes and investment managers. The IPS is reviewed by the Board's fiduciary counsel.

On a quarterly basis, the Investment Officer reports to the Board on (a) the overall performance of the System's investments, (b) the investment performance of the investment managers of each asset class within the TCDRS portfolio, (c) the status of the asset allocation plan, (d) all transactions managed internally, including performance of such transactions, as applicable, (e) any material infractions (of which the Investment Officer is aware) of third party providers and managers retained by the Board to invest, settle or safekeep the System's investment assets, and (f) any other matters requested by the Board from time to time. This quarterly reporting process has been followed under stress test conditions over the past 20 years. This quarterly report is a standard component of the Board package, and it is available to the public.

The IPS is reviewed quarterly and is modified, as appropriate, at the Board's discretion. The last revision to the IPS was in September 2022 when the IPS was updated to include updated benchmark names.

(2) A detailed review of the retirement system's investment asset allocation, including: (A) the process for determining target allocations;

The primary means through which the Board ensures that the System achieves the System Investment Objective is through an asset allocation plan. This is documented in the IPS and is updated on an annual basis. The asset allocation plan is developed based on a set of capital market assumptions adopted by the Board as set forth in the IPS in Table 3 of Exhibit A. These assumptions provide the primary basis from which the Board can determine whether the selected asset allocation plan is designed to attain the System Investment Objective. TCDRS provides the public with full transparency, including a video on its website and description of the allocation process and a listing of the current capital market assumptions on tcdrs.org.

On a quarterly basis, the Investment Officer provides the Board with a report on the status of the System's asset allocation plan, and the Board formally reviews the System's asset allocation plan not less than annually. In the course of its review, the Board considers current capital market assumptions, the existing allocation percentages and priorities, and possible modification to the asset allocation plan and the list of asset classes.

The asset allocation plan identifies the asset classes in which the System may invest and the corresponding allocation percentages for each such class. The Board's asset allocation plan is set forth in the IPS in Table 1 of Exhibit A. These allocation percentages are market-value based and specify the minimum, maximum, and target percentages authorized by the Board for each asset class.

These minimum, maximum, and target percentages provide the framework for allocating assets of the System. Within these funding restrictions, and in light of ever-changing market conditions, the Investment Officer allocates funds to approved investment managers or authorized investment vehicles in a manner that, in the Investment Officer's judgment, enhances the System's ability to achieve the System Investment Objective over the long term. In the event an asset class exceeds the maximum allocation percentage or is below the minimum allocation percentage established for such class, the Board authorizes the Investment Officer to rebalance assets in a manner consistent with this Policy in order to bring the allocation percentage within the allowable range for the asset class.

The asset allocation is integrated with the overall investment objective of the System (the "System Investment Objective"), which is to attain the maximum risk-adjusted return over a long-term period (30 years or more) within an acceptable level of risk.

The Board periodically reviews and evaluates the System Investment Objective, considering, among other factors, TCDRS benefit design, expected future returns and risk on invested assets, employer cost volatility and future expected cash flows as the System matures. The System's actuaries, both internal and external, are integrated into the conversation as is the Investment Officer and investment consultants.

The asset allocation process uses capital market assumptions (expected return, risk, correlation) for each asset class. The covariance matrix, along with appropriate constraints, are used to develop an efficient frontier of asset mixes that maximize return at differing risk levels. This is standard in the industry and the System has consistently applied this process since diversifying out of the 100% bond portfolio in 1995. The System does not implement a tactical asset allocation. Instead, target weights are established to each asset class as well as permissible ranges around the targets.

Each year, Cliffwater conducts a study of state pension performance, included as an attachment. The most recent, "An Examination of State Pension Performance, 2000-2021" as of September 2022, covers 65 state pensions that use June 30 as their fiscal year end and report investment and other financial data as of that calendar date. The source of the data is the respective systems' annual financial reports ("ACFRs"). Collectively, the 65 state pensions reported $3.3 trillion in assets at June 30, 2021. The TCDRS actual asset allocation as of June 30, 2021, is shown below compared to the state weighted average from that survey. The NACUBO report as of June 30, 2021, is the source for the asset allocation for large endowments with assets greater than $1 billion.

	June 30, 2021 Acutal		
	Endowments > $1 Bn	**TCDRS**	**State Wtd Avg**
Global equity	29%	32%	46%
Fixed Income/Cash	9%	4%	21%
Private Debt	1%	24%	3%
Real Estate	5%	6%	7%
Real Assets	6%	3%	5%
Private Equity	30%	22%	13%
Hedge Funds	18%	9%	3%
Other	2%	0%	2%
Total	100%	100%	100%

Due to its unique construct, the TCDRS asset allocation differs from the typical state pension plan and is more comparable to a large endowment. Unlike the typical public defined benefit pension plan that relies on annual contributions approved by the respective contributing body, TCDRS is a savings plan whereby any shortfall/excess versus the 7.5% annual crediting rate is automatically amortized into the participating system's annual rate reset. Additionally, unlike most state pensions that are in a net cash outflow situation, TCDRS is in a slightly negative cash flow position such that TCDRS can withstand a higher level of illiquidity than a typical state pension plan. Given these circumstances, TCDRS has maintained an asset allocation policy more comparable to a large endowment, focusing on return generation while balancing risk through diversification. As such, there is a lower exposure to public stocks and bonds with a higher exposure to private equity, hedge funds and credit investments.

(B) the expected risk and expected rate of return, categorized by asset class;

The TCDRS Board reviews the asset allocation (including assumptions, targets and ranges) on an annual basis. The asset allocation plan is developed based on a set of capital market assumptions adopted by the Board as set forth in the attached IPS in Table 3 of Exhibit A and available on tcdrs.org. These assumptions provide the primary basis from which the Board can determine whether the selected asset allocation plan is designed to attain the System Investment Objective and are shown below. The approach used by the system is sound, consistent with best practices and results in a well-diversified portfolio.

TCDRS Capital Market Assumptions
As of Jan. 1, 2022

ASSET CATEGORY (PORTFOLIO)	EXPECTED RETURN	EXPECTED RISK*
U.S. Equities	6.40%	17.00%
International Equities — Developed	6.40%	18.00%
International Equities — Emerging	6.90%	26.00%
Global Equities	6.70%	17.70%

Hedge Funds	4.15%	4.40%
Strategic Credit	4.37%	5.86%
Distressed Debt	7.10%	11.00%
Direct Lending	8.85%	8.00%
Private Equity	9.40%	20.00%
REITs	5.70%	22.00%
Commodities	1.50%	18.00%
Master Limited Partnerships	6.45%	24.00%
Private Real Estate Partnerships	7.70%	30.00%
Investment-Grade Bonds	1.75%	4.00%
Cash and Cash Equivalents	1.55%	2.00%

* Measured as one standard deviation.
See the correlation table from the TCDRS Investment Policy.

The asset allocation plan identifies the asset classes in which the System may invest and the corresponding allocation percentages for each such class. The Board's asset allocation plan, designed to achieve the System's Investment Objective, is set forth in the attached IPS in Table 1 of Exhibit A and are shown below.

TCDRS Asset Allocation Parameters

Asset Class (Portfolio)	Measurement Benchmark (Index)	Min %	Max %	Target %
U.S. Equities	Dow Jones U.S. Total Stock Market Index	4%	19%	11.5%
Global Equities	MSCI World (net) Index	0%	6%	2.5%
Intl Equities – Developed Markets	MSCI World ex USA (net) Index	1%	11%	5%
Intl Equities – Emerging Markets	MSCI Emerging Markets (net) Index	1%	11%	6%
Investment-grade Bonds	Bloomberg US Aggregate Bond Index	1%	15%	3%
Strategic Credit[1]	FTSE High-Yield Cash-Pay Index	5%	16%	9%
Direct Lending[1]	Morningstar LSTA US Leveraged Loan TR USD Index	4%	23%	16%
Distressed Debt[1]	Cambridge Associates Distressed Securities Index[4]	1%	7%	4%
TIPS	Bloomberg US 10 Year Breakeven Inflation Index	0%	3%	0%
REIT Equities	67% FTSE NAREIT All Equity REITs Index +33% S&P Global REIT (net) Index	0%	5%	2%
Commodities	Bloomberg Commodities Index	0%	3%	0%
Master Limited Partnerships	Alerian MLP Index	0%	5%	2%
Private Real Estate Partnerships[1]	Cambridge Associates Real Estate Index[2]	1%	10%	6%
Private Equity[1]	Cambridge Associates Global Private Equity & Venture Capital Index[3]	10%	35%	25%
Hedge Funds[1]	Hedge Fund Research, Inc. (HFRI) Fund of Funds Composite Index	0%	13%	6%
Cash Equivalents[1]	90-day US Treasury	0%	10%	2%

[1] Due to the extended period required to transact in Hedge Funds, Strategic Credit, Direct Lending, Distressed Debt, Private Equity and Private Real Estate asset classes, the benchmarks for these asset classes will be incorporated into the TCDRS Policy Index at their actual weights until they approach their target allocations. Unfunded target allocations of the Strategic Credit, Direct Lending, Distressed Debt, Private Equity and Private Real Estate asset classes will be netted against overallocations to Hedge Funds. Any remaining unfunded target allocations will then be invested equally between U.S. Equity and Investment-Grade Bonds with the TCDRS Policy Index weights for each increased accordingly.

[2] Includes vintage years 2007-present of Quarter Pooled Horizon IRRs.
[3] Includes vintage years 2006-present of Quarter Pooled Horizon IRRs.
[4] Includes vintage years 2005-present of Quarter Pooled Horizon IRRs.

The capital market assumptions used are developed by the System's investment consultant and are designed to be viewed over a 10-year time frame. The return forecast consists of cash yield and growth expectations by asset class. Short term tactical components, such as valuation changes, are not included in the long-term return forecasts. Manager alpha is assumed to equal zero in asset classes that are known to exhibit market efficiency and where active management has proved challenging. For these asset classes, typically public markets, the expected return assumptions would reflect what would be earned by a passive (index fund) investor where diversification is broadest, and expenses are small. In fact, TCDRS heavily utilizes passive management in these asset classes (US equity, developed non-US equity, emerging markets). However, in a number of alternative asset classes, such as private equity, private credit and hedge funds, an alpha component is added to long term expected return. These expected returns from alpha are re-examined annually based upon measurement of past alpha generation, and changes are made accordingly.

Return volatility and correlation forecasts rely upon calculations using monthly historical returns when the asset class is liquid and broadly captured by an index that is accepted industry-wide. However, returns for many of the major alternative asset classes, including private equity, private debt, and real estate, are quarterly in frequency with values determined by accounting or appraisal standards that frequently understate true volatility and correlation. This occurs because valuations are done by professionals, as opposed to market traders, tend to be less frequent and backward looking. The result is a time series of returns (values) that exhibit lower periodic change and serial correlation, which together is characterized as "smoothing." In the capital market assumptions, the asset returns are statistically "unsmoothed" for those indices representing private asset classes.

(C) and the appropriateness of selection and valuation methodologies of alternative and illiquid assets; and

As noted, the primary means through which the Board ensures that the System achieves the System Investment Objective is through an asset allocation plan. This is documented in the IPS and is updated on an annual basis. The asset allocation plan is developed based on a set of capital market assumptions adopted by the Board as set forth in the IPS in Table 3 of Exhibit A and tcdrs.org. These assumptions provide the primary basis from which the Board can determine whether the selected asset allocation plan is designed to attain the System Investment Objective.

The asset allocation plan identifies the asset classes in which the System may invest and the corresponding allocation percentages for each such class, both for liquid and illiquid, alternative asset classes. The Board's asset allocation plan is set forth in the IPS in Table 1 of Exhibit A. These allocation percentages are market-value based and specify the minimum, maximum, and target percentages authorized by the Board for each asset class. TCDRS has been investing in alternative asset classes since 2005 and has developed the level of staffing and expertise since that time to match the increase in exposure to alternative investments. This is reviewed annually to ensure the system's alternative investments are appropriate given its size and level of investment expertise.

The IPS defines "alternative investments", and they include investments within one of the following asset classes:

- Private equity – investments in business made through means other than through publicly-traded securities such as buyout investments and venture capital.

- Distressed debt – investments in the debt of financially distressed companies.
- Direct lending – investments in privately originated debt to companies or to real estate investors, including through business development companies, as well as other yield oriented non-correlated funds including, but not limited to, royalty streams and aviation leases.
- Strategic credit – investments primarily in debt instruments that provide return opportunities driven by dislocations in the capital markets or by credit risk.
- Hedge funds – investment strategies with the goal of achieving positive returns with a degree of independence from movements in financial markets and independent of traditional performance benchmarks.
- Real assets – investments in assets that have a return linked to inflation, such as energy related investments and other commodity-based investments.
- Real estate – investments that have an ownership interest in either timber or direct real estate properties, either income or non-income producing.

Alternative investments are typically made through an interest in a limited partnership but also may be made through another vehicle (e.g., separate account, commingled fund, offshore entity, etc.), as appropriate for the individual investment. As such, it is important to understand the governing documents of the alternative investment as this outlines the valuation methodology used for the respective fund.

Each alternative investment category has their own set of investment guidelines and performance measurement standards that are detailed in the attached IPS. The selection and monitoring/measurement process for alternative investments is described in the response to question (5) that follows.

A separate operational due diligence report is performed on each of the alternative investments prior to selection. This review focuses on risk assessment and a best practices review in order to place the firm in context to other firms. As part of this review, the following categories are evaluated:

- Governance. Focus is on the business management structure that includes business professionals and processes focused on legal, regulatory and compliance, advisory board interaction as well as business risk management practices including liability insurance and disaster recovery plans and use of placement agents.

- Operations Infrastructure. Private asset funds should have experienced operating staff to manage all non-investment functions, with duties segregated to ensure proper controls. The firm's service providers and technology infrastructure are reviewed.

- Processes. Look for well-defined processes and procedures that are structured to mitigate risk in the areas of financing, transparency, and disclosure, as well as the quality of ongoing information provided to investors. A review of the quarterly and annual audited financial statements is performed and there is a detailed review of fees and expenses charged to the fund.

- Valuation. This review covers all aspects of valuation from methodology, valuation sources, review process, advisory board oversight, and accounting processes.

TCDRS reviews each of the alternative investment funds' audited financial statements and these valuations are aggregated into the TCDRS ACFR, which is reviewed by its external auditing firm.

(D) future cash flows and liquidity needs;

Annually TCDRS works with an outside consulting actuary to conduct cash flow projections on an open group basis over the next decade. TCDRS is only slightly cash-flow negative over the next 10 years. As liquidity is not currently an issue for the system, the two main risks considered by the Board when making investment decisions are 1) the long-term risk that investment return combined with employer and employee contributions will not be enough to pay future benefit claims; and 2) the short-term risk of year-to-year volatility impacting employers' rates.

Because TCDRS employers have to pay required contributions which are adjusted each year for actual investment performance, TCDRS manages risk closely. The System does significant work educating employers on how their benefit costs might fluctuate under various market scenarios and explaining the tools available to control plan costs and manage risks. Employers have the ability to manage rate volatility risk by adjusting benefits annually. Employers may change how much employees are saving and/or employer matching. In addition, employers may choose to make additional contributions to pay down liabilities faster and create a buffer for future adverse experience.

Employers are provided customized rate modeling that shows the impact of benefit/funding scenarios on the employer rate under various economic conditions based on our current asset allocation and capital market assumptions. In addition, the employers have access to an online tool, the Plan Customizer, that allows employers to model benefit changes and additional contributions and to see the impact they may have on their employees' benefits, and the employer's costs and liabilities. Each employer receives annually, in the summary valuation report, a stress test that shows the employer contribution rate under negative economic scenarios. As a result of education efforts, more than one-third of TCDRS' more than 830 employers make additional contributions creating plan-level reserves for the future.

TCDRS has system-wide tools to help manage risk. In addition, to managing risk in the portfolio, TCDRS maintains a reserves fund (currently over $5.5 billion as of Dec. 31, 2021) to help offset future adverse experience.

As of Dec. 31, 2021, TCDRS was nearly 89% funded (when reserves are considered, TCDRS is more than 101% funded). TCDRS does not receive funding from the State of Texas. Each plan is funded by employers, members and investment earnings. TCDRS has a conservative funding policy ensuring that employers fund the plans responsibly. By paying 100% of the required contribution rate every year, employers are paying for their current employees' future benefits and are paying down any unfunded liabilities within 20 years. The weighted-average amortization period of TCDRS plans is 16.4 years, one of the lowest in the state. Due to TCDRS' disciplined funding policy, the unique nature of the savings-based benefit accrual, and annually resetting employer rates to account for demographic, investment and benefit changes; plans are continually kept in balance. Thus, changes in liabilities and investment and demographic experience do not have the same impact on investment strategy as these factors may have in other plans.

The Board has established a funding policy available at www.tcdrs.org to govern the actuarial program and to ensure responsible, disciplined funding. The funding policy governs how TCDRS determines the employer contributions required to ensure that benefits provided to TCDRS members are funded in a reasonable and equitable manner. The goals of TCDRS' funding policy are to fully fund benefits over the course of employees' careers, to ensure intergenerational equity and to balance rate and benefit stability with the need for the plan funding to be reflective of current plan conditions. In addition, the Board's governance policy requires TCDRS to ensure that actuarial assumptions are coordinated appropriately with the TCDRS Investment Policy.

The Board hires independent outside consulting actuaries to conduct an annual valuation to measure the funding status and to determine the required employer contribution rate for each employer plan. The valuation of each employer plan is based on the system funding policy and the assets, benefits and participant profile of each participating employer plan.

In the valuation process, assumptions are used to estimate liabilities and to determine the amount of funding required from the employer. These assumptions reflect a long-term perspective. A complete listing of all actuarial assumptions can be in found in the annual systemwide valuation report. The investment return assumption is forward-looking and is used to determine how much funding for benefits is estimated to come from investment earnings versus employer contributions.

The TCDRS Board periodically reviews and revises the assumptions as necessary to reflect best estimates of future experience. Every four years, the TCDRS consulting actuary, hired by the Board, conducts an experience study. TCDRS assumptions are compared to plan experience and to future expectations. Changes to the assumptions are recommended as needed, and the Board adopts actuarial assumptions to be used in the annual valuation based on the results of this study. Each year the actuary also confirms the reasonableness of the assumptions.

An audit is required of every experience study and must be performed by another independent auditing actuary to review the consulting actuary's analysis, conclusions and recommendations for accuracy, appropriateness and reasonableness. The reviewing actuary independently analyzes economic assumptions to test the results and recommendations of the consulting actuary. In addition, audits are also conducted every four years on the annual valuation.

TCDRS current investment return assumption is 7.5%. The most recent experience study to review TCDRS' economic and demographic assumptions was as of December 31, 2021. Two independent actuarial firms concurred that the investment return assumption was reasonable. The evaluation was based on TCDRS' capital market assumptions and asset allocation, which is significantly different than traditional public plans and more comparable to the endowment and foundation universe. In addition, the consulting actuary has annually monitored the investment return assumption for reasonableness.

As previously noted, TCDRS has unique measures in place to manage risk associated with investment volatility and the investment return assumption, including a $5.5 billion reserves fund (as of Dec. 31, 2021) that may be used to offset future adverse experience. In addition, the system resets rates annually based on investment experience and requires the employers to fund any liabilities over a conservative 20-year period. The average amortization period in the system is 16.4 years. The employers also have the unique ability to adjust benefits, liabilities and costs each year based on their local needs and budgets by adjusting how much employees are saving and the employer matching.

(3) A review of the appropriateness of investment fees and commissions paid by the retirement system;

TCDRS reports all investment returns "net of fees". Because of this, the investment results reported on tcdrs.org and in publications and financial reports are the actual values available for TCDRS use.

Fees compensate investment managers for their time and expertise. For TCDRS, these fees are paid out of investment earnings. TCDRS provides full transparency on fees by reporting both management and carried interest fees on tcdrs.org and in their annual financial report. As defined in the IPS, the TCDRS Investment Officer is responsible for managing the administrative investment operations of the System.

TCDRS is focused on ensuring that their resources (e.g., investment management fees, personnel time, etc.) will be expended in the asset classes where there is a higher probability of consistent manager outperformance or where index funds are not available (e.g., alternative investments). Given this, the entire TCDRS US equity exposure is in index funds, over 60% of the developed non-US equity exposure is in index funds and approximately 10% of emerging markets exposure is in index funds. For the remaining public market asset classes, active management is used in global equity, core fixed income, MLPs, REITs, and credit. The public market managers, along with their fee schedules, are formally reviewed every three years.

TCDRS uses active management in alternative investments (e.g., private equity, distressed debt, direct lending, strategic credit, hedge funds, real assets, real estate). Because of the level of diligence and operational flexibility required to make certain alternative investments in a timely and prudent manner, the Board has established a process for the approval of alternative investments that is documented in the IPS.

Investment management fees for alternative investments, such as hedge funds, private credit, private real estate and private equity, are higher than fees for more traditional investments, such as public market equities. There are also manager incentives associated with alternative investments. The objective of these incentives is to align the investment manager's interests with TCDRS' interests.

Alternative investment fees generally fall into three categories:

- Management fees: These typically range from 1.5% to 2% of invested assets (hedge funds, direct lending and opportunistic credit) or committed capital (private equity, private real estate, distressed debt). They are intended to compensate the general partner for its costs in operating the partnership.
- Profit sharing (also called "carried interest"): These fees incentivize and align the general partner's interest with TCDRS' interests. The carried interest represents

the general partner's share of the partnership's profits, typically 20%, with 80% going to the limited partners such as TCDRS. Generally, an agreed rate of return, or preferred return, must first be surpassed before carried interest is earned by the general partner. After this, there is a "waterfall" as to how investment gains are distributed to the general partner and to the limited partners. To incentivize general partners to maintain performance, periods of negative performance may result in previously accrued carried interest being reduced or "clawed back".

- Fund expenses: These reflect administrative items, exclusive of investment related expenses.

During investment, operational and legal due diligence, fees paid to investment managers are evaluated to determine if they are consistent with four objectives:

1. An <u>alignment of interests</u> between investor and manager.

   The first part of this is evaluating any "asymmetry". Managers are sharing in the upside (profits) but not necessarily the downside (losses). One possible way to mitigate this problem is to ensure that managers are investing a significant fraction of their own capital into the same investment or fund (also known as "GP commitment"). While indirect, at least the manager has more motivation to mitigate losses knowing its own money is at risk. Conversely, sometimes a concern arises if the manager has too much money invested in the fund, causing the manager to become too risk averse for fear of losing significant personal assets.

   A second part of the evaluation is known as "crystallization", or the frequency with which performance fees are paid. Ideally, performance fees are paid only when the investor exits the fund. All profits and losses are fully netted against each other and over time. Anything less and the investor is at risk of paying a performance fee on profits which potentially cannot be recaptured if losses follow afterward.

   Many private equity funds pay performance fees as each asset is realized (sold). A "clawback" provision in the legal documents can protect investors if performance fees are paid on early profits from realizations but are followed later by realized losses. Hedge funds, however, generally pay performance fees annually on realized and unrealized net gains. Sometimes, a year of sizable investment gains can generate performance fees that are not recouped when followed by a year of investment losses. A mitigating factor is that hedge funds generally have a "high water mark" where future performance fees will not be paid until cumulative past losses have been recovered.

2. Fees which are largely conditional upon the manager exceeding a performance benchmark for measuring true excess return, either from alpha or alternative beta, that cannot otherwise be replicated passively.

   Very few performance fees charged by alternative investment managers today are tied to profits above a performance benchmark, as suggested above. In the case of hedge funds, the performance benchmark is most frequently a zero percent return. However, during the due diligence on hedge funds, an "alpha split simulator" is used that incorporates fee, expense, and investment assumptions to derive a distribution of alpha, fees, and fractional percent of alpha likely to be earned by the investor versus the hedge fund.

   Private equity and debt managers also calculate performance fees on total profits without reference to a market benchmark. However, they almost always have a "preferred return", generally 8.0%, below which they earn no performance fee. If performance is above the preferred return, manager performance fees often "catch up" to what the manager would have earned absent the preferred return.

3. A level of fees that represents a fraction share of expected gross excess return and where that fraction is inversely related to the uncertainty in excess return.

   As noted previously, during the due diligence on hedge funds, an "alpha split simulator" is used that incorporates fee, expense, and investment assumptions to derive a distribution of alpha, fees, and fractional percent of alpha likely to be earned by the investor versus the hedge fund.

4. Fund expenses that reflect only administrative items, exclusive of investment related expenses.

   As part of the operational review, the fund is compared to a list of best practices with respect to transparency and disclosures, including side letters, placement agent fees, related party transactions and all fees and expenses. A review of the quarterly and annual audited financial statements is performed and there is a detailed review of fees and expenses charged to the fund.

TCDRS' external legal counsel reviews all governing fund documents prior to agreement. TCDRS is very focused on being early in the legal negotiation process to change and/or influence the final set of legal documents, if needed. TCDRS staff, external legal counsel and consultants work together to minimize the amount of fees that TCDRS ultimately pays with the goal of ensuring that each set of legal documents encapsulates the previously noted objectives. To further minimize fees, TCDRS focuses its size and economies of scale with respect to investment structuring such as having customized separate accounts, negotiating "most-favored nations clauses", negotiating relationship discounts, getting GP ownership stakes if seeding new investment strategies, etc.

TCDRS collects and reviews all fees and expenses annually. TCDRS provides full transparency on fees by reporting both management and carried interest fees on tcdrs.org and in their annual financial report.

(4) A review of the retirement system's governance processes related to investment activities, including investment decision-making processes, delegation of investment authority, and Board investment expertise and education; addressing transparency, investment knowledge/expertise and accountability.

The TCDRS Board of Trustees provides leadership for the system and is responsible for overseeing the investment of TCDRS assets. The Board adopts the investment policy, allocates assets, hires legal firms, consultants, custodians, investment managers and monitors performance. They receive assistance from the Investment Officer and staff, along with professional firms they have hired in carrying out that responsibility. TCDRS investments are managed by an experienced team with diverse skills and responsibilities. The internal team is supported by consultants, custodians, legal firms and external managers. Both staff and consultants work together to make informed, responsible decisions about TCDRS investments. Staff and consultants perform extensive due diligence for the Board before recommending the hiring of investment managers and monitor those investment managers as they work toward specific goals, investing funds according to TCDRS investment policy. Oversight of investment managers includes reviews of operations, on-site visits, background checks, reviews of financial information and continuous monitoring after hire. All board-hired contracts, including the investment consultant, are reviewed annually as part of the governance policy process with an in-depth contract review conducted every four years.

A video on Investment Oversight is available to the public at tcdrs.org.

THE TCDRS BOARD OF TRUSTEES:

	ADOPTS INVESTMENT POLICY	ALLOCATES ASSETS	HIRES INVESTMENT MANAGERS	MONITORS PERFORMANCE
WITH SUPPORT FROM:	INVESTMENT OFFICER AND STAFF	INVESTMENT OFFICER AND STAFF	INVESTMENT OFFICER AND STAFF	INVESTMENT OFFICER AND STAFF
	INVESTMENT CONSULTANT *Cliffwater*	INVESTMENT CONSULTANT *Cliffwater*	INVESTMENT CONSULTANT *Cliffwater*	INVESTMENT CONSULTANT *Cliffwater*
	FIDUCIARY COUNSEL *Jackson Walker*		INVESTMENT COUNSEL *Vinson & Elkins*	PERFORMANCE MEASUREMENT ANALYST *BNY Mellon*

The nine-member Board is comprised of system members and retirees appointed by the governor and confirmed by the Texas Senate. TCDRS trustees serve staggered six-year terms and have oversight of all system operations, including strategic direction, the annual budget, policy determination, legislative proposals and investment policy. The Board appoints an executive director to manage the day-to-day operations of TCDRS and an investment officer to oversee TCDRS investments.

The Board governs using the Policy Governance model and has a Board of Trustees' Policy Manual that outlines the strategic goals of the organization and clearly defines the roles, responsibilities and limitations of the board, executives and staff. In addition, the board maintains a written investment policy statement that documents TCDRS' investment objectives, policies, guidelines and procedures; outlines the duties and responsibilities, and provides guidance to the fiduciaries of the System.

Board meetings are publicly posted and held quarterly. The meetings are typically one day in length with over 50% of each meeting devoted to investment-related matters. Board policy, the investment policy, meeting agendas and minutes are all posted to the website, tcdrs.org. Meeting minutes contain summaries of discussion items, actions taken by the board and records of votes on motions.

Board training is required by the Pension Review Board and the TCDRS Board Policy. The Pension Review Board requires a minimum of seven hours of accredited core training during the first year of appointment as a trustee and four hours of continuing education during subsequent two-year periods. Core training includes the following topic areas:

Investments, Benefits Administration, Fiduciary Matters, Governance, Ethics, Actuarial Matters and Risk Management. In addition, the TCDRS Board Policy requires Trustees to complete an orientation at TCDRS' offices and attend at least one continuing education program as designated by the board every two years. Board members are briefed on available educational opportunities annually. All Board members are current on training requirements.

Both passive and active styles of asset management are used. Funds managed in the passive style, seek to match the performance of an established market index (e.g., the Dow Jones U.S. Total stock Market Index) by investing in the same securities as the index. Asset classes that are passively managed include: U.S. equities, International developed equities (partial), and International emerging equities (partial).

With investments managed in the active style, investment managers try to exceed the performance of a market index by actively selecting securities that they believe will outperform and avoiding those they think will underperform. Asset classes that are managed actively at TCDRS include: global equities, international developed equities (partial), emerging market equities (partial), hedge funds, credit investments, private equity, real assets, and investment-grade bonds.

Quarterly the Board monitors the effectiveness of the investment program, considers any needed changes to the investment policy, reviews governance processes and monitors performance. See other sections of this report for more detailed information.

(5) A review of the retirement system's investment manager selection and monitoring process.

Selection Process

The Board is ultimately responsible for the selection of investment managers to manage the portfolios within the asset classes. However, the Investment Officer and appropriate investment consultants/legal advisors will assist the Board in the selection process.

For publicly traded securities investment managers, the Investment Officer and appropriate investment consultant will conduct the initial search for investment managers for publicly-traded securities portfolios and perform the due diligence required in connection with the search. The process for this search will include developing the criteria for the investment mandate, determining the appropriate managers for the investment mandate, and interviewing the most qualified candidates. The appropriate investment consultant and Investment Officer will consult following the search process and jointly recommend a candidate or candidates to the Board. The Board will evaluate such candidate(s) and make the final selection of an investment manager. Managers are evaluated based upon:

- the stability and general experience of the firm;
- client relations;
- quality, stability, depth and experience of personnel;
- philosophy/process
- performance
- fees
- TCDRS portfolio fit

TCDRS is focused on ensuring that TCDRS resources (e.g., investment management fees, personnel time, etc.) will be expended in the asset classes where there is a higher probability of consistent manager outperformance or where index funds are not available (e.g., alternative investments). Given this, the entire TCDRS US equity exposure is in index funds, over 60% of the developed non-US equity exposure is in index funds and approximately 10% of emerging markets exposure is in index funds. For the public markets, active management is used in global equity, core fixed income, MLPs, REITs, and credit.

TCDRS uses active management in alternative investments (e.g. private equity, distressed debt, direct lending, strategic credit, hedge funds, real assets, real estate). Because of the level of diligence and operational flexibility required to make certain alternative investments in a timely and prudent manner, the Board has established a process for the approval of alternative investments that is documented in the IPS.

The alternative investment consultant and the Investment Officer will periodically present to the Board for approval a list of recommended investments in each alternative investment asset class. These alternative investments will be recommended based on the alternative investment consultant's analysis and due diligence performed on such alternative investments.

Once the Board has approved the list of recommended investments, the Investment Officer and the alternative investment consultant will select investments from such list to carry out the annual plan for each of the alternative investment asset classes. The investments will be selected in a manner intended to enable TCDRS to meet its long-term return objectives set forth for the respective asset class. The investment objectives and guidelines for the respective asset classes of alternative investments are set forth in the respective sections of the IPS. Once an investment is selected, the alternative investment consultant's analysis for each selected investment will be set forth in a report and made available to the Board.

In selecting investment vehicles for recommendation, the Investment Officer and the investment consultant providing services with respect to one or more alternative asset classes shall comply with the IPS and shall endeavor to select the highest quality managers available that will enable the various alternative asset programs to meet their long-term return objectives within the parameters established by the guidelines included in the IPS. In connection with this process, the alternative investment consultant shall conduct extensive due diligence on potential alternative investments for the purpose of making recommendations to the Board. Selection of alternative asset vehicles will take into consideration the following criteria:

- Quality and stability of the firm and investment team;
- Previous investment track record of the investment vehicle manager;
- Proposed investment strategy;
- Ability of investment vehicle manager to demonstrate capability to generate superior returns;
- Operational capabilities;
- Legal and economic terms governing the partnership or other vehicle;
- Alignment of interests; and
- TCDRS portfolio fit.

Recognizing the importance of vintage year diversification and the importance of striving to achieve adequate portfolio diversification by investing in different types of alternative asset investments, in different partnerships or other vehicles, with managers representing various investment styles, industries and geographic concentrations, the Investment Officer and alternative investment consultant will develop an annual plan for alternative investments in private equity, private real estate, and distressed debt and present each such plan to the Board. This annual plan will reflect a pace of commitments that, considering forecasted cash flows, is expected to achieve the System's targeted allocation to the alternative asset class over a reasonable time period. This annual plan will be integrated with the existing portfolio and the prevailing economic environment and market conditions.

Not all recommended alternative investments on the list approved by the Board will be completed for reasons including, but not limited to, unavailability of capacity on the part of the approved alternative investment, selection(s) by the Investment Officer and alternative investment consultant among approved alternative investments with similar strategies, and an inability to successfully negotiate legal and/or economic terms. Counsel employed by TCDRS will review and assist in the negotiation of each approved alternative investment's governing legal documents.

In addition to approving the list of recommended investments, the Board may authorize the Investment Officer to invest in alternative investments that have not previously been presented to the Board if an investment opportunity arises on which action must be taken prior to the next meeting of the Board. An authorization of this type will identify the asset classes in which the Investment Officer has such approval and place both aggregate and individual dollar limits for such investment. The Investment Officer shall promptly notify the Board of any investments made pursuant to this provision, and the Board will ratify such investments at its next regularly scheduled meeting.

Investment legal counsel for the System reviews the agreement or agreements governing the relationship between the System and all selections made pursuant to investment manager, consultants, custodian selection prior to execution of the agreement or agreements by the authorized officer of the System. Evidence of such review will be included with the agreement or agreements that are retained as part of the records of the System.

Monitoring Process

In terms of performance monitoring, the Board retains a performance measurement analyst to report performance of the System's investments based upon a total return using time-weighted rate of return calculations. Performance is calculated on a monthly basis on a gross and net of fee basis. These reports (a) set forth the overall investment performance of the System's investments and the performance of individual investment managers within asset classes and (b) compare the overall performance of the System's investments with the System's Investment Objective set forth in the IPS and the TCDRS Policy Index. The Board formally reviews these reports on a quarterly basis. These reports are provided on a summary and detailed level with verbal explanation to address differing levels of investment knowledge/expertise.

Additionally, performance measurement benchmarks for each asset class are reviewed and approved by the Board. The performance measurement benchmarks for each asset class, previously shown, are set forth in the IPS, Table 1 of Exhibit A. Based on the benchmarks approved for each asset class and the target asset allocation of the System, a composite benchmark for the overall portfolio of the System will be established and referred to as the "TCDRS Policy Index." This composite benchmark will be utilized in monitoring the overall investment performance of the System's investments.

Investment guidelines and objectives are also established for each publicly-traded securities investment manager, they are incorporated into each respective investment manager agreement and (1) establish relative and/or absolute performance expectations, which are a function of the efficiency of the asset class and the type of investment strategy employed, (2) delineate which investments and strategies the manager is permitted to use to achieve its performance objectives, and which investments and strategies the manager is prohibited from using, and (3) specify the characteristics a manager's portfolio is expected to display. If TCDRS is invested in a commingled investment vehicle, the manager is expected to adhere to the guidelines governing the respective vehicle. The individual investment manager portfolio parameters are set forth in the IPS, Table 2 of Exhibit A and are shown below.

Investment Manager Parameters

Asset Classes (Portfolios)	Investment Manager	Investment Style	Long-term Performance Objective
U.S. Equities	State Street Global Advisors	Passive	Replicate return of Dow Jones U.S. Total Stock Market Index before fees
International Equities - Developed	State Street Global Advisors	Passive	Replicate return of MSCI World ex USA (net) Index before fees
	Marathon-London International Fund	Active	Annualized net returns > 150 bps* over MSCI EAFE (net) Index over rolling 5-year periods
International Equities - Emerging	State Street Global Advisors	Passive	Replicate return of MSCI Emerging Markets (net) Index
	Dimensional Fund Advisors	Active	Annualized net returns > 100 bps* over MSCI Emerging Markets (net) Index
	JP Morgan, Marshall Wace, and Wellington	Active	Annualized net returns > 200 bps* over MSCI Emerging Markets (net) Index
Global Equities	Viking Long Fund,	Active	Annualized net returns > 200 bps* over MSCI World (net) Index
	Marshall Wace		Annualized net returns > 200 bps* over MSC ACWI (net) Index
TIPS	Western Asset Management Co.	Active	Annualized net returns > 15 bps* over Bloomberg US 10 Year Breakeven Inflation Index
Investment-grade Bonds	Jennison Associates Dodge & Cox Prudential Investment Mgmt.	Active	Annualized net returns > 50 bps* over Bloomberg US Aggregate Bond Index & rank in top half of managers with similar objectives over 3-5 year horizon
Distressed Debt	Portfolio of Managers	Active	Annual net returns > Cambridge Associates Distressed Securities Index[3]
Direct Lending	Portfolio of Managers	Active	Annual net returns > Morningstar LSTA Leveraged Loan TR USD Index
Strategic Credit	Portfolio of Managers	Active	Annualized net returns > FTSE High-Yield Cash-Pay Index
REIT Equities	Cohen & Steers	Active	Annualized net returns > 200 bps* over FTSE NAREIT All Equity half of managers with similar objectives over 3 to 5-year horizon

	Dimensional Fund Advisors (global)	Active	Annual net returns > S&P Global REIT (net) Index
Commodities	Wellington Management Co., LLP Gresham Investment Management	Active	Annualized net returns > 100 bps over Bloomberg Commodities Index
Master Limited Partnerships	Harvest Fund Advisors	Active	Annualized net returns > Alerian MLP Index
Private Real Estate Partnerships	Portfolio of Managers	Active	Annual net returns > Cambridge Associates Real Estate Index [1]
Private Equity	Portfolio of Managers	Active	Annual net returns > Cambridge Associates Global Private Equity & Venture Capital Index[2]
Hedge Funds	Portfolio of Managers	Active	Annual net returns > Hedge Fund Research, Inc. (HFRI) Fund of Funds Composite Index
Cash Equivalents	Investment Officer	Active	Realize competitive, overnight returns

*A return of one hundred basis points (bps) is equivalent to a 1% return.
[1] Includes vintage years 2007-present of Quarter Pooled Horizon IRRs.
[2] Includes vintage years 2006-present of Quarter Pooled Horizon IRRs.
[3] Includes vintage years 2005-present of Quarter Pooled Horizon IRRs.

Performance evaluation criteria are established for each of the alternative investment categories. For hedge funds, performance will be evaluated relative to peer universes and by the asset category benchmark as set forth in the IPS, Table 1 of Exhibit A. For private market investments (e.g. private equity, real estate, distressed debt, direct lending, strategic credit), individual investment vehicle performance, as measured by the internal rate of return, will be evaluated compared to the performance of respective peer universes and vintage years, as reflected by the Private Equity Program benchmark; provided, however, the Strategic Credit, Distressed Debt and Direct Lending components within the Private Equity Program will instead be evaluated compared to the asset class benchmarks set forth in the IPS on Table 1 of Exhibit A.

The operations of an investment manager will be monitored by the Investment Officer and appropriate investment consultants to ensure compliance with (a) the manager's investment objectives and guidelines or with the applicable investment guidelines and performance objectives for alternative investments, as applicable, (b) the terms of this Policy, and (c) the TCDRS Act and other applicable law.

If an investment manager (1) fails to conform to the applicable investment objectives and guidelines and performance objectives, (2) fails to operate in a safe and sound manner, (3) experiences a material change in ownership or personnel that impacts the reasons TCDRS initially hired the investment manager, or (4) violates the terms of the investment manager agreement or other governing agreement, this Policy, the TCDRS Act, or other applicable law, the Investment Officer is authorized to take appropriate remedial action. Remedial action may include immediate termination. The Investment Officer shall promptly report to the Board any remedial action taken pursuant to the IPS.

For the publicly traded securities investment manager, in addition to the monitoring described above, an investment consultant will periodically, but no less frequent than once every three years, perform a formal evaluation of the performance of the publicly traded securities investment managers. After considering the evaluations and recommendations of the appropriate investment consultant, the Board determines what action, if any, should be taken with respect to the investment managers. The Investment Officer maintains a schedule for these periodic reviews.

Additionally, in connection with monitoring alternative investments, the Investment Officer and staff and/or alternative investment consultant conducts portfolio reviews and on-site due diligence as necessary. Site visits are also performed to confirm that appropriate infrastructure is in place to support the investment process.

With respect to the monitoring of alternative investments, the System also takes appropriate advantage of the rights offered to TCDRS through limited partnership agreements or other governing agreements. In addition to regular performance and portfolio reviews, meetings with alternative investment managers and site visits, the Investment Officer monitors adherence to partnership agreements and other governing agreements by reviewing allocations, distributions, expenses, restrictions, valuations, amendments, potential conflicts of interest, reporting requirements, and timely expiration of investment periods.

Changes in asset allocation, investment risk decisions, asset class portfolio structures and liquidity preferences will also result in a review of the respective investment managers involved in the asset class being changed.

Independent Firm Disclosures:

1. **A summary outlining the qualifications of the firm in evaluating institutional investment practices and performance.**

Cliffwater LLC was founded in 2004 and provides consulting services on over $100 billion in assets under management to institutional clients. Cliffwater LLC is an independent investment adviser and asset manager that provides research, advisory, and investment services. Cliffwater LLC helps clients develop customized, diversified portfolios that balance return, volatility, and liquidity most effectively.

2. **A statement that the firm meets the experience requirements.**

Cliffwater meets the experience requirements.

3. **A statement indicating the nature of any existing relationship between the firm and the system being evaluated.**

Cliffwater provides non-discretionary consulting services to TCDRS.

4. **A statement acknowledging that the firm, or its related entities, is not involved in directly or indirectly managing investments of the system.**

Cliffwater and its related entities are not involved in directly or indirectly managing investments of the system.

5. **A statement identifying any potential conflict of interest or any appearance of a conflict of interest that could impact the analysis between the independent firm and the system or any current/former member of the system's governing body.**

None

6. **A list of the types of remuneration received by the firm from sources other than the retirement system for services provided to the system.**

None.

7. **An explanation of the firm's determination regarding whether to include a recommendation for each of the evaluated matters in the report or a lack thereof.**

There are no recommendations for any of the evaluated areas in the report as TCDRS has a disciplined and systematic process of formally reviewing all aspects of its investment policy each quarter. The process of which has been described in detail in the discussion section of the evaluated areas. Changes to the policy, if required, are subsequently made and reviewed by all relevant parties, including the Board.