State Teachers Retirement System of Ohio
STRS Ohio Total Fund

June 30, 2020

ACA
COMPLIANCE GROUP
PERFORMANCE SERVICES

Verification and Performance Examination Report

State Teachers Retirement System of Ohio
275 East Broad Street
Columbus, OH 43215-3771

We have verified whether State Teachers Retirement System of Ohio ("the *Firm")* (1) has complied with all the composite construction requirements of the Global Investment Performance Standards (GIPS®) on a firm-wide basis for the periods from July 1, 2006 through June 30, 2020, and (2) designed its policies and procedures to calculate and present performance in compliance with the GIPS standards as of June 30, 2020. We have also conducted a performance examination of the Firm's Total Fund for the periods from July 1, 2006 through June 30, 2020. The Firm's management is responsible for compliance with the GIPS standards and the design of its policies and procedures and for the Total Fund's compliant presentation. Our responsibility is to express an opinion based on our verification and performance examination. We conducted this verification and performance examination in accordance with the required verification and performance examination procedures of the GIPS standards. In addition, we examined the Supplemental Information, including the accompanying notes, for the period from July 1, 2019 through June 30, 2020 according to industry performance standards as described in the Supplemental Information accompanying notes. We also conducted such other procedures as we considered necessary in the circumstances.

In our opinion, the Firm has, in all material respects:

- Complied with all the composite construction requirements of the GIPS standards on a firm-wide basis for the periods from July 1, 2006 through June 30, 2020, and
- Designed its policies and procedures to calculate and present performance in compliance with the GIPS standards as of June 30, 2020.

Also, in our opinion, the Firm has, in all material respects:

- Constructed the Total Fund and calculated the Total Fund's performance for the periods from July 1, 2006 through June 30, 2020 in compliance with the GIPS standards; and
- Prepared and presented the Total Fund's accompanying compliant presentation for the periods from July 1, 2010 through June 30, 2020 in compliance with the GIPS standards.

Additionally, in our opinion, the accompanying Supplemental Information for the period from July 1, 2019 through June 30, 2020 has been calculated and presented, in all material respects, in compliance with industry performance standards as described in the Supplemental Information accompanying notes.

This report does not relate to or provide assurance on any composite compliant presentation of the Firm other than the Firm's Total Fund.

Adviser Compliance Associates, LLC

Adviser Compliance Associates, LLC
ACA Performance Services Division
August 10, 2020

State Teachers Retirement System of Ohio
Total Fund
July 1, 2010 through June 30, 2020

	Total Fund			As of June 30	
Fiscal Year	Gross Return (%)	Net Return (%)	Benchmark Return (%)	% of Externally-Managed Assets (%)	Total Composite Assets ($ millions)
2020	3.14	3.01	3.07	31	77,080
2019	7.13	6.99	7.30	30	78,851
2018	9.57	9.43	8.94	30	77,750
2017	14.29	14.15	13.52	29	75,060
2016	0.92	0.78	0.67	30	69,861
2015	5.45	5.33	5.08	28	74,173
2014	16.83	16.71	17.53	28	74,812
2013	13.66	13.54	14.17	25	67,982
2012	2.34	2.23	2.05	25	63,802
2011	22.59	22.48	22.36	24	66,163

State Teachers Retirement System of Ohio ("STRS Ohio") claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. STRS Ohio has been independently verified for the period from July 1, 2006 through June 30, 2020.

Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. The Total Fund has been examined for the period from July 1, 2006 through June 30, 2020. This combined verification and performance examination report is available upon request.

Accompanying Notes

1. For the purpose of complying with the GIPS standards, the firm is defined as the State Teachers Retirement System of Ohio ("STRS Ohio"), which was established in 1919 by the Ohio General Assembly and is the sponsor and manager of assets for the State Teachers Retirement System of Ohio. The Total Fund was created and incepted in 1919.

2. The Total Fund includes all discretionary assets managed by STRS Ohio for the benefit of participants in the State Teachers Retirement System of Ohio. The strategy reflects an actual asset allocation to the following asset classes as of June 30, 2020: Liquidity Reserves 1.9%, Fixed Income 19.5%, Domestic Equities 28.2%, International Equities 22.4%, Global Equities 0.7%, Real Estate 9.7% and Alternative Investments 17.6%. The assets of STRS Ohio are managed in accordance with the risk budget for the Total Fund and the individual asset classes. The investment objective for the Total Fund is to earn, over moving thirty-year periods, an annualized return that equals or exceeds the actuarial rate of return, approved by the State Teachers Retirement Board ("Board") to value STRS Ohio liabilities. Effective July 1, 2017, the actuarial rate of return assumption is 7.45%. The Board-approved asset allocation policy from the 2017

Asset Liability Study was adopted after careful consideration of the investment objectives, liability structure, funded status and liquidity needs of STRS Ohio, and the return, risk and risk-diversifying characteristics of different asset classes. STRS Ohio hires external managers to manage selected portfolios. The percent of externally-managed assets for the Total Fund as of June 30 for the past 10 fiscal years is disclosed on page 1. Descriptions of the asset classes are as follows:

Fixed Income: The Fixed Income asset class is generally fully invested in fixed income instruments and includes a core fixed income portfolio as well as a liquid treasury portfolio. The core fixed income portfolio is reflective of the Bloomberg Barclays U.S. Universal Index composed of the following issuers: U.S. Government and related agencies; mortgage backed and asset backed issuers; foreign issuers; corporations including investment grade and high yield; and emerging market debtors. The methodology employed places an emphasis on fundamental economic, portfolio and security analysis to manage sector weightings and maturity distributions. The strategy of the liquid treasury portfolio is to provide liquidity to meet the rebalancing and cash flow needs of the Total Fund. The fixed income asset class seeks diversification by market sector, quality, and issuer. The asset class is primarily managed internally, with external managers utilized in specialist segments of the market such as high yield and emerging market debt. Derivatives may be used to adjust the exposure to interest rates, individual securities or to various market sectors in the fixed income portfolio. Underlying exposure of derivatives for fixed income investments may not exceed 5% of Total Fund assets. As of June 30, 2020, fixed income derivative positions were 0.06% as a percentage of Total Fund assets. STRS Ohio has given its internal and external managers discretionary authority to manage the assets in the account including, but not limited to, futures, options, currency, and swaps. STRS Ohio enters into forward currency contracts for hedging purposes.

Domestic Equities: The Domestic Equities asset class includes domestic and international common stocks traded on U.S. exchanges, American depository receipts (ADR's), real estate investment trust shares (REITs) and domestic equity derivatives (including, but not limited to, futures, stock options and index options). Sector tilts by style, economic sectors or market capitalization are managed in accordance with the risk budget for domestic equities. A variety of portfolio management approaches including quantitative and fundamental techniques are used to diversify the source of excess return. The asset class utilizes a combination of active and passive management and multiple internal and external portfolio managers to improve the likelihood of achieving excess returns, to diversify risk and to control costs. STRS Ohio will invest no more than 3% of the Total Fund in equities of any one company. Underlying exposure of equity derivatives may not exceed 10% of Total Fund assets. As of June 30, 2020, domestic equity derivative positions were 0.27% as a percentage of Total Fund assets.

International Equities: The International Equities asset class is a diversified portfolio including both developed and emerging countries. Portfolios consist of international equities including international common stocks traded on U.S. exchanges, ADR's and ordinaries, international depository receipts (IDR's), country funds, international equity derivatives (including, but not limited to, stock options and index options), and some short-term debt instruments. The asset class emphasizes quantitative and fundamental management approaches and exposures to security selection and country allocation decisions. Internal and external managers have the ability to add value through currency management. Aggregate exposures to countries, currencies, equity styles and market capitalization are monitored and managed relative to their benchmark exposures and the risk budget. The portfolio utilizes a combination of internal and external management to improve the likelihood of achieving excess returns, to diversify risk and to control costs.

Underlying exposure of derivatives for international equities may not exceed 10% of Total Fund assets. As of June 30, 2020, international equity derivative positions were 1.52% as a percentage of Total Fund assets. STRS Ohio has given its internal and external managers discretionary authority to manage the assets in the account including, but not limited to, financial, currency and stock index futures, equity swaps, and options on futures and other securities. STRS Ohio invests in international equity swaps through its internally managed program and this represents the primary exposure of derivatives used in this asset class, at 1.02% of Total Fund assets as of June 30, 2020. The STRS Ohio international equity swaps are unleveraged derivative instruments that are constructed to replicate the effect of investing directly in foreign equity markets. The swap contracts entitle STRS Ohio to receive the US dollar return (including currency fluctuations) of a single market index or basket of indexes. In exchange, STRS Ohio is obligated to pay a short-term cash return. The market risk of the swaps is comparable to owning the underlying stocks that comprise the indexes. STRS Ohio also enters into forward currency contracts for hedging purposes.

Global Equities: The Global Equities portfolio includes domestic and non-U.S. based equities. This actively managed portfolio employs quantitative techniques and is broadly diversified. It can actively tilt at the country, sector or stock level depending upon its models' expectations. Underlying exposure of equity derivatives in this portfolio combined with the international equities asset class may not exceed 10% of Total Fund assets. As of June 30, 2020, global equity derivative positions were 0.00% as a percentage of Total Fund assets.

Real Estate: Real estate investments are primarily investments in direct properties which are diversified between property type, geographic location, and investment ownership structure and are internally managed. Typically, higher risk/return strategies such as opportunistic commingled funds, both domestic and international, are managed by external real estate managers and are limited to 20% of the real estate asset class. Publicly traded real estate securities are passively managed internally and are targeted at 15% of the real estate asset class to enhance liquidity and diversification. Private real estate is 100% actively managed because index funds replicating the real estate broad market are not available. STRS Ohio may borrow funds on a secured or unsecured basis and leverage is limited to 50% of the internally managed direct real estate assets. At June 30, 2020 and 2019, debt as a percentage of these assets was 28.2% and 24.3%, respectively. The debt as a percentage of assets calculation has changed for the periods shown to reflect the portion of debt attributed to STRS Ohio. Derivatives may be used and cannot exceed 1% of total assets. As of June 30, 2020, real estate derivative positions were 0.00% as a percentage of Total Fund assets. Due to the nature of real estate investments, all private real estate is valued using market based inputs that are comparable but subjective in nature due to the lack of widely observable inputs.

Alternative Investments: Alternative investments consist of private equity and opportunistic/diversified investments. Private equity investments primarily include venture capital, growth equity and leveraged buyout opportunities and are 100% actively managed because index funds are not available. Private equity risk is diversified by investing across vintage years, industry sectors, investment size, development stage and geography, in addition to investing in mezzanine debt, sector-focused and international funds. STRS Ohio typically invests as a limited partner in closed-end partnerships. Private equity investments are managed by general partners with good deal flow, specialized areas of expertise, established or promising net of fees track records, and fully disclosed and verifiable management procedures.

Opportunistic/diversified investments were established within alternative investments with the intention of diversifying out of public equities and shifting into investments that will produce "equity like" returns while also providing downside protection in bear markets. Therefore, over the long run, the opportunistic/diversified portfolio is expected to generate returns equal to the Russell 3000 Index minus 1%. Investments in this category can be liquid or illiquid and are tactical in nature. Opportunistic/diversified investments are actively managed because index funds are not available. Downside protection can be achieved and asset class risk is diversified by investing across different types of opportunistic/diversified investments. Opportunistic/diversified investments may be made directly, through specialist managers, or through fund-of-funds.

Due to the nature of alternative investments, substantially all investments in this asset class are valued using market based inputs that are comparable but subjective in nature due to the lack of widely observable inputs. Underlying exposure of derivatives for alternative investments may not exceed 10% of Total Fund assets. As of June 30, 2020, alternative investment derivative positions were 0.42% as a percentage of Total Fund assets. STRS Ohio utilizes both listed and over-the-counter (OTC) options, futures, and swaps with the

S&P 500 Index as the underlying exposure. These positions are primarily used for hedging purposes with a smaller percentage classified as positioning.

Liquidity Reserves: The liquidity reserves portfolio is intended to obtain a high level of current income consistent with the preservation of principal and liquidity. Investments generally consist of U.S. dollar-denominated short-term securities of corporations that are rated in the highest category (A1/P1 rating) by the rating organizations and in securities that are guaranteed by the U.S. government or one of its related agencies. Credit quality is emphasized for preservation of principal and liquidity.

3. Returns are net of brokerage commissions, expenses related to trading, and applicable foreign withholding taxes on dividends, interest, and capital gains. All returns are expressed in U.S. dollars.

   Total Fund performance is calculated monthly using the Modified Dietz method. Gross returns are net of actual management fees for externally managed real estate and alternative investments. Net returns are net of all other investment management costs (internal and external). Costs are reported annually by CEM Benchmarking Inc. (CEM) on a calendar year basis and are reflected in the Board's Trustee Summary Report in the Callan Associates quarterly performance report. Investment management costs include internal investment personnel, professional and technical services and other investment operating expenses, actual external manager fees, custodial banking fees, and allocated overhead and oversight including Information Technology Services (ITS). Total investment management costs deducted from the gross return to arrive at the net return have ranged from 11 to 14 basis points per year over the past 10 years.

   Policies for valuing portfolios, calculating performance, and preparing the compliant presentation are available upon request.

4. The Total Fund Composite includes all individual portfolios that are combined into one aggregate portfolio for GIPS compliance purposes. The performance of the combined portfolio reflects the overall mandate of the plan. Because the Total Fund Composite is one aggregate portfolio for all periods, no measure of internal dispersion of annual portfolio returns is presented.

5. The three-year annualized ex-post standard deviation measures the variability of the composite (using Total Fund returns) and the benchmark for the 36-month period ended at the following dates:

	3-Yr Annualized Standard Deviation (%)	
June 30	Total Fund	Benchmark
2020	8.8	8.7
2019	6.2	6.0
2018	6.0	5.9
2017	6.2	6.2
2016	6.7	6.8
2015	4.8	5.0
2014	7.7	8.1
2013	8.7	9.0
2012	10.4	10.6
2011	15.1	15.2

6. Benchmark returns are provided to represent the investment environment existing during the time periods shown and are not covered by the report of independent verifiers. Each asset class utilizes a benchmark, which as of June 30, 2020 is as follows:

Fixed Income: The Fixed Income blended benchmark is calculated daily and is a blend of two benchmarks using the actual core fixed income weighting and the Bloomberg Barclays U.S. Universal index[1] and the actual weighting of the liquid treasury portfolio weighting and the Bloomberg Barclays U.S. Intermediate Treasury index[1]. Bloomberg Barclays U.S. Universal Index represents the union of the U.S. Aggregate Index, U.S. Corporate High-Yield Index, Investment Grade 144A Index, Eurodollar Index, U.S. Emerging Markets Index, and the non-ERISA eligible portion of the CMBS Index. The Bloomberg Barclays U.S. Universal Index covers USD-denominated, taxable bonds that are rated either investment grade or below investment grade. The Bloomberg Barclays U.S. Intermediate Treasury Index consists of U.S dollar-denominated, fixed-rate, nominal debt issued by the U.S. Treasury. Maturities are between 1 year and up to 10 years.

Domestic Equities: Russell 3000® Index[2], which measures the performance of the 3,000 largest U.S. companies based on total market capitalization, and represents approximately 98% of the investable U.S. equity market.

International Equities: The international blended benchmark is calculated monthly using 80% of the MSCI World ex-U.S. 50% Hedged Index-Net and 20% of the MSCI Emerging Markets Index-Net. The MSCI World ex-U.S. 50% Hedged Index-Net is a free float-adjusted market capitalization index of approximately 1,000 foreign companies that is designed to measure developed market equity performance, excluding the United States. The 50% hedged index captures the performance of the international equity markets while capping the effects of currency fluctuations on the U.S. dollar to 50%. A forward rate is used to construct the hedge. The MSCI Emerging Markets Index-Net is a free float-adjusted market capitalization index that is designed to measure equity performance in the global emerging markets. The index is rebalanced monthly. MSCI assumes the maximum withholding tax rate applicable to institutional investors.

Global Equities: MSCI All Country World Index-Net, which is a free float-adjusted market capitalization index denominated in U.S. dollars of approximately 49 countries and measures the equity performance of U.S., non-U.S. developed and emerging markets. MSCI assumes the maximum withholding tax rate applicable to institutional investors.

Real Estate: The Real Estate blended benchmark is calculated quarterly and is a blend of two benchmarks using 85% of the NCREIF Property Index (NPI) 85% and 15% of the FTSE NAREIT Equity REITs Index. The NCREIF Property Index is an unlevered quarterly time series composite total rate of return measure of investment performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only. All properties in the NPI have been acquired, at least in part, on behalf of tax-exempt institutional investors – the great majority being pension funds. As such, all properties are held in a fiduciary environment. The FTSE NAREIT Equity REITs Index is a float-adjusted market capitalization index of 149 companies that is designed to measure U.S. Equity REIT performance.

Alternative Investments: Given the long-term nature of the asset class, STRS Ohio believes that no benchmark return is appropriate for shorter time periods for this asset class and the Alternative Investment

[1] Source: Bloomberg Index Services Limited. BLOOMBERG® is a trademark and service mark of Bloomberg Finance L.P. and its affiliates (collectively “Bloomberg”). BARCLAYS® is a trademark and service mark of Barclays Bank Plc (collectively with its affiliates, “Barclays”), used under license. Bloomberg or Bloomberg’s licensors, including Barclays, own all proprietary rights in the Bloomberg Barclays Indices. Neither Bloomberg nor Barclays approves or endorses this material, or guarantees the accuracy or completeness of any information herein, or makes any warranty, express or implied, as to the results to be obtained therefrom and, to the maximum extent allowed by law, neither shall have any liability or responsibility for injury or damages arising in connection therewith.

[2] The Russell Indices are a trademark of the FTSE International Limited (FTSE) and Frank Russell Company (Russell) and their respective subsidiary undertakings, which are members of the London Stock Exchange Group plc group.

actual return is used when calculating the Total Fund benchmark. For longer time periods such as 5 or 10 years, the Alternative Investment blended benchmark is used for asset class relative performance and is in two parts by policy: Private Equity is the Russell 3000 Index plus 1% and Opportunistic/Diversified is the Russell 3000 Index minus 1%.

Liquidity Reserves: The ICE BofAML US 3-Month Treasury Bill Index is used.

The Total Fund blended benchmark is calculated monthly using a blend of the asset class benchmarks based on the Total Fund's policy weights for the respective asset classes, as follows:

	Jul 1, 2019-Jun 30, 2020
Fixed Income	21%
Domestic Equities	28%
International Equities	23%
Real Estate	10%
Alternative Investments	17%
Liquidity Reserves	1%

Information concerning asset class benchmarks and policy weights for other periods is available upon request.

7. Past performance is not an indicator of future investment performance results.

8. As the Total Fund represents 100% of the assets managed by STRS Ohio, this presentation represents STRS Ohio's list of composite descriptions.

Supplemental Information:

The information in the table below is supplemental to the Total Fund compliant presentation presented on the previous pages. Performance information is for the period July 1, 2019 through June 30, 2020.

Fund/Asset Class	Gross Return (%)	Benchmark Return * (%)	As of June 30, 2020 Number of Portfolios	Assets ($ millions)	% of Fund Assets (%)	% of Externally Managed Assets (%)
Total Fund	3.14	3.07	74	77,080	100.0	31
Fixed Income	8.10	7.93	9	15,066	19.5	13
Domestic Equities	7.87	6.53	17	21,736	28.2	10
International Equities	-5.17	-3.63	16	17,252	22.4	43
Global Equities	-3.43	2.11	1	558	0.7	0
Real Estate	2.28	0.91	9	7,436	9.7	13
Alternative Investments	-1.03	-1.03	21	13,541	17.6	86
Liquidity Reserves	1.47	1.63	1	1,491	1.9	0

* Total Fund and asset class benchmarks as of June 30, 2020 are as follows:

Fund/Asset Class	Benchmark
Total Fund	Total Fund blended benchmark
Fixed Income	Fixed Income blended benchmark
Domestic Equities	Russell 3000 Index
International Equities	International blended benchmark
Global Equities	MSCI All Country World Index – Net
Real Estate	Real Estate blended benchmark
Alternative Investments	Alternative Investments Actual Return
Liquidity Reserves	ICE BofAML US 3-Month Treasury Bill Index

Please refer to Note 6 earlier in the report for further discussion of the Total Fund and asset class benchmarks.

Accompanying Notes

Returns are net of brokerage commissions, expenses related to trading, and applicable foreign withholding taxes on dividends, interest, and capital gains. All returns are expressed in U.S. dollars.

Total Fund and asset class returns are calculated as follows:

Total Fund performance is calculated monthly using the Modified Dietz method. The Total Fund gross return is net of actual management fees for externally managed real estate and alternative investments. The Total Fund net return, which is net of all investment management costs (internal and external), was 3.01% for the year ended June 30, 2020 and the fund under-performed its Total Fund benchmark by 0.06% net of all investment management costs over this same time period. Costs are reported annually by CEM Benchmarking Inc. on a calendar year basis and are reflected on the Board's Trustee Summary Report in the Callan Associates quarterly performance report. Investment management costs include internal investment personnel, professional and technical services and other investment operating expenses, actual external manager fees, custodial banking fees, and allocated overhead and oversight including Information Technology Services (ITS).

Fixed Income performance is calculated daily. Performance of the internally-managed portfolios excludes cash returns, as cash is swept daily into the liquidity reserves portfolio. Performance reflected above is presented gross of investment management fees.

Domestic Equities performance is calculated daily. Performance of the internally-managed portfolios excludes cash returns, as cash is swept daily into the liquidity reserves portfolio. Performance reflected above is presented gross of investment management fees.

International Equities performance is calculated daily. Performance of all portfolios in this asset class includes cash returns. Performance reflected above is presented gross of investment management fees.

Global Equities performance is calculated daily. Performance of the portfolio in this asset class includes cash returns. Performance reflected above is presented gross of investment management fees.

Real Estate performance is calculated daily with private real estate valuation changes reported monthly. Internally managed direct real estate investments are valued by an external appraiser once every three years and by an internal valuation quarterly. Valuations of externally managed commingled real estate funds are determined by the underlying investment manager quarterly, with supporting financial statements when available. Performance of real estate excludes cash returns, as cash is swept daily into the liquidity reserves portfolio. Performance reflected above is presented gross of internal investment management costs and net of external investment management fees.

Alternative Investments performance is calculated monthly using the Modified Dietz method. Alternative investments are valued by the underlying investment manager with supporting financial statements generally on a quarterly basis. Typically there is a 1 to 3 month lag in the market values used by STRS Ohio but the values are adjusted to reflect current capital activity. Performance of alternative investments excludes cash returns, as cash is swept daily into the liquidity reserves portfolio. Performance reflected above is presented gross of internal investment management costs and net of external investment management costs, including management fees, carry, and fund expenses.

Liquidity Reserves performance is calculated daily.