# SEATTLE CITY EMPLOYEES' RETIREMENT SYSTEM
## Report of Independent Auditors
## and Financial Statements with
## Required Supplementary Information
## and Additional Information

**December 31, 2018 and 2017**

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**CONTENTS**

# INDEPENDENT AUDITORS' REPORT

Board of Administration
Seattle City Employees' Retirement System
Seattle, Washington

## Report on the Financial Statements

We have audited the accompanying financial statements of the Seattle City Employees' Retirement System (SCERS), which comprise the statements of fiduciary net position as of December 31, 2018 and 2017, and the related statements of changes in fiduciary net position for the years then ended, and the related notes to the financial statements.

### *Management's Responsibility for the Financial Statements*

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### *Auditors' Responsibility*

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

***Opinion***

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of SCERS as of December 31, 2018 and 2017, and the results of its operations for the years then ended in accordance with accounting principles generally accepted in the United States of America.

**Report on Required Supplementary Information**

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and the schedules of changes in net pension liability and related ratios, employer contributions, and investment returns be presented to supplement the basic financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the financial statements, and other knowledge we obtained during our audits of the financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

**Report on Other Information**

Our audits were conducted for the purpose of forming an opinion on the financial statements as a whole. The additional information, as listed in the table of contents, is presented for purposes of additional analysis and is not a required part of the financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. The information has been subjected to the auditing procedures applied in the audits of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the additional information, as listed in the table of contents, is fairly stated in all material respects in relation to the financial statements as a whole.

CliftonLarsonAllen LLP

**CliftonLarsonAllen LLP**

Baltimore, Maryland
June 12, 2019

This section presents management's discussion and analysis of the Seattle City Employees' Retirement System's (SCERS or the System) financial performance during the years ended December 31, 2018 and 2017. Please read it in conjunction with the accompanying financial statements and the related notes.

The City of Seattle is responsible for establishing and maintaining an internal control structure designed to ensure the protection of assets from loss, theft, or misuse, and to ensure the accounting information generated is adequate to prepare financial statements in conformity with generally accepted accounting principles. The internal control structure is designed to provide reasonable, though not absolute, assurance of achieving these objectives.

As a department of the City of Seattle, the Seattle City Employees' Retirement System is subject to this internal control structure. In addition, section 4.36.140.D of the Seattle Municipal Code requires the Board of Administration to annually transmit a report of the financial condition of the System to the City Council.

This report is prepared in accordance with the principles of governmental accounting and reporting promulgated by the Governmental Accounting Standards Board (GASB). Investments are stated at fair value, and revenues include the recognition of unrealized gains and losses. The accrual basis of accounting is used to record assets, liabilities, revenues and expenses. Revenue recognition occurs when earned without regard to the date of collection. Expense recognition occurs when the corresponding liabilities are incurred, regardless of payment date. The basis of contributions to the System follows the principles of level cost financing, with current service financed on a current basis. Milliman Consultants and Actuaries, the consulting actuary, evaluates the status of the System from both an accounting and funding perspective.

**This report contains the following information:**

1. **Basic Financial Statements** including:
    a. Statements of Fiduciary Net Position
    b. Statements of Changes in Fiduciary Net Position
    c. Notes to the Financial Statements

2. **Required Supplementary Information** including:
    a. Schedule of Changes in Net Pension Liability and Related Ratios
    b. Schedule of Employer Contributions
    c. Schedule of Investment Returns

3. **Additional Information** including:
    a. Schedule of Administrative Expenses
    b. Schedule of Investment Expenses

The basic financial statements are described as follows:

- The Statements of Fiduciary Net Position show the account balances at year-end and includes the fiduciary net position available for future benefit payments. The liabilities for future benefit payments are not included in this statement; however, they are shown in the Schedule of Changes in Net Pension Liability and Related Ratios that is included in the Required Supplementary Information.

- The Statements of Changes in Fiduciary Net Position show the sources and uses of funds during the year and illustrates the change in fiduciary net position from the previous year.

- The Notes to the Financial Statements are an integral part of the financial statements and include additional detailed information and schedules to provide a better understanding of the financial statements.

The required supplementary information provides historical trends that help to reflect the ongoing plan perspective and the long-term nature of the defined benefit plan.

- The Schedule of Changes in Net Pension Liability and Related Ratios contains actuarial information about the status of the plan.

- The Schedule of Employer Contributions contains historical trend information regarding the value of the actuarially determined employer contributions, and the actual contributions paid by the employer.

- The Schedule of Investment Returns contains the investment returns realized on the total portfolio for the last 10 years.

**Financial Highlights**

- Net position decreased by $135.4 million (-4.7%) during 2018. The primary driver was net investment losses of $106.6 million. Net position increased by $364.4 million (14.6%) during 2017. The primary driver was net investment income of $388.2 million.

- Revenue (additions to net position) for 2018 was $87.5 million which includes member and employer contributions of $194.1 million partially offset by net losses on investment activity totaling $106.6 million. Revenue additions to net position for 2017 were $573.9 million which includes member and employer contributions of $185.7 million and revenue from investment activity totaling $388.2 million.

- Expenses (deductions from net position) for 2018 increased by $13.4 million (6.4%) from 2017. This can be primarily attributed to a $11.2 million increase in retiree benefits. In 2018, the net increase in the number of retirees receiving benefits was 3.9%. Expenses for 2017 increased by $14.9 million (7.6%) from 2016. This can be primarily attributed to a $10.3 million increase in retiree benefits. In 2017, the net increase in the number of retirees receiving benefits was 2.4%.

**Fiduciary Net Position**

The table below provides a summary of assets and current liabilities for the years ended December 31:

| | 2018 | 2017 | 2016 |
|---|---|---|---|
| Cash and cash equivalents and receivables | $ 155,873,550 | $ 293,323,449 | $ 443,140,843 |
| Investments at fair value | 2,755,618,644 | 2,815,776,988 | 2,351,299,369 |
| Securities Lending Collateral | 4,834,509 | 11,358,941 | 11,130,677 |
| Total Assets | 2,916,326,703 | 3,120,459,378 | 2,805,570,889 |
| Securities lending payable | 4,820,034 | 11,350,612 | 11,125,376 |
| Other payables | 194,069,851 | 256,236,201 | 305,947,349 |
| Total Liabilities | 198,889,885 | 267,586,813 | 317,072,725 |
| **Total fiduciary net position** | $ 2,717,436,818 | $ 2,852,872,565 | $ 2,488,498,164 |

**Changes in Fiduciary Net Position**

The table below provides a summary of the changes in plan fiduciary net position and reflects the activities of the fund for the years ended December 31:

| | 2018 | 2017 | 2016 |
|---|---|---|---|
| Additions: | | | |
| Employer contributions | $ 117,816,201 | $ 112,102,982 | $ 108,454,496 |
| Member contributions | 76,285,206 | 73,650,409 | 71,755,857 |
| Net investment income (loss) and other income | (106,569,274) | 388,156,509 | 189,941,169 |
| Total additions | 87,532,133 | 573,909,900 | 370,151,522 |
| Deductions: | | | |
| Retiree benefits | 190,475,464 | 179,226,526 | 168,967,298 |
| Refunds of contributions | 20,287,842 | 19,158,756 | 16,456,570 |
| Administrative expenses | 12,204,574 | 11,150,217 | 9,250,653 |
| Total deductions | 222,967,880 | 209,535,499 | 194,674,521 |
| **Net increase (decrease)** | $ (135,435,747) | $ 364,374,401 | $ 175,477,001 |

**Revenues - Additions to Fiduciary Net Position**

- In 2018, employer contributions increased by $5.7 million (5.1%) compared to 2017. In 2017, employer contributions increased by $3.6 million (3.4%) compared to 2016.
- Member contributions increased by $2.6 million (3.6%) compared to 2017. Member contributions increased by $1.9 million (2.6%) compared to 2016.

- Investment activities resulted in a loss of $106.6 million in 2018 compared to net investment gain of $388.2 million in 2017 and $189.9 million in 2016.

**Expenses - Deductions from Fiduciary Net Position**

- Retiree benefits increased in 2018 by $11.2 million (6.3%) compared to 2017, primarily due to the increased number of members making application for retirement and a mandatory 1.5% COLA (Cost of Living Adjustment). As a comparison, retiree benefits increased $10.3 million (6.1%) in 2017.

- Refunds of contributions increased in 2018 by $1.1 million (5.9%) compared to amounts paid in 2017. In 2017, refunds increased by $2.7 million (16.4%) compared to amounts paid in 2016.

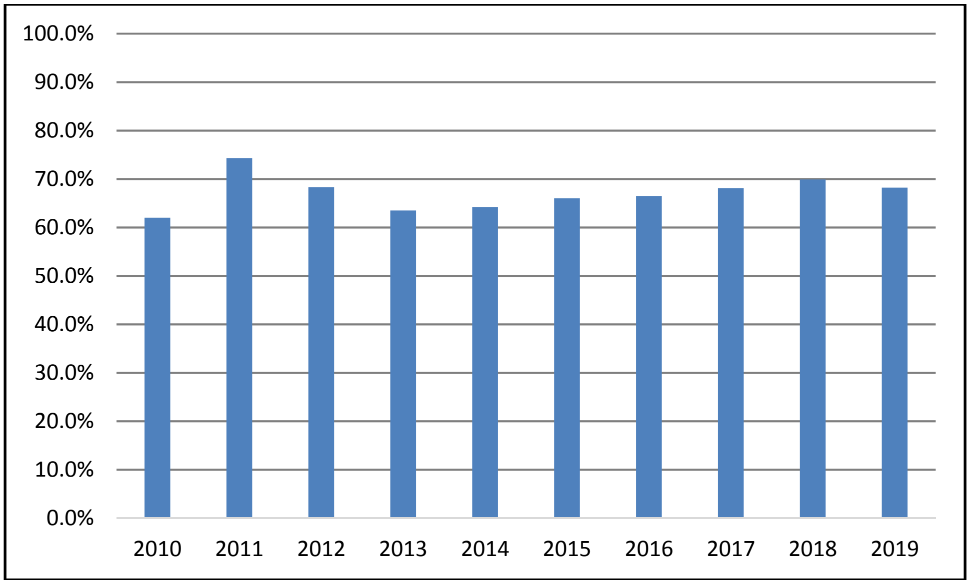
**Changes in Plan Membership**

The table below reflects the active membership and retiree changes for the years ended December 31:

| | 2018 | 2017 | Change |
|---|---|---|---|
| Retirees and beneficiaries receiving benefits | 6,792 | 6,534 | 3.9% |
| Current and terminated employees: | | | |
| Current employee members | 9,390 | 9,283 | 1.2% |
| Terminated members entitled to, but not yet receiving benefits | 1,332 | 1,312 | 1.5% |
| Terminated members not entitled to benefits beyond contributions and accumulated interest, Non-Vested | 1,307 | 1,193 | 9.6% |
| **Total** | 18,821 | 18,322 | 2.7% |

**Funding Status**

**Schedule of Funding Progress**
**Funding Ratio**
**As of January 1st Valuation Date**




With the January 1, 2011 Valuation and the 2007-2010 Experience Study, the Board of Administration adopted a policy of asset smoothing over a 5-year period. The reported funding ratio as of January 1, 2012 reflects that change. Prior to January 1, 2011, all funding ratios were reported on a market basis.

Funds are accumulated from employer and employee contributions and investment earnings and are used to pay present and future benefit obligations and administrative expenses.

The City of Seattle adopted a second tier (Tier II) of the System for new eligible employees starting January 1, 2017. Active Tier I members contributed 10.03% of their salaries to the retirement fund in 2018 and 2017 and the City contributed 15.23% and 15.29% in 2018 and 2017, respectively. Active Tier II members contributed 7.00% and the City contributed 14.42% in 2018 and 2017.

The graph above refers to the results of actuarial valuations prepared for funding purposes in accordance with Actuarial Standards of Practice (ASOPs). However, GASB 67 requires a separate actuarial valuation for accounting purposes. The primary purpose of the valuation for accounting purposes is to provide consistent, standardized methodology that allows comparability of amounts and increased transparency of the pension liability across U.S. pension plans complying with GASB 67. When reporting in accordance with GASB 67, the Plan Fiduciary Net Position as a Percentage of the Total Pension Liability was 64.14% as of December 31, 2018.

## Investment Activities

One-year returns on asset classes (net of fees) and comparative benchmarks are presented in the table below for the years ended December 31. These returns are calculated on a time-weighted rate of return basis:

| Investment Performance | 2018 | 2017 |
|---|---|---|
| Total Portfolio | -3.7% | 15.7% |
| Benchmark: Policy Index | -3.6% | 15.9% |
| Public Equity | -10.3% | 23.8% |
| Benchmark: MSCI ACWI IMI w/US Gross | -9.8% | 24.3% |
| Core Fixed Income | -0.1% | 3.6% |
| Benchmark: Bloomberg Barclays U.S. Aggregate Index | 0.0% | 3.5% |
| Credit Fixed Income | -1.9% | 7.9% |
| Benchmark: Custom Credit Index | -1.4% | 7.2% |
| Private Equity | 24.5% | 8.5% |
| Benchmark: Custom Private Equity Index | 20.0% | 16.2% |
| Real Estate | 7.7% | 7.7% |
| Benchmark: NCREIF ODCE Index | 7.7% | 6.7% |
| Infrastructure | 10.0% | 4.5% |
| Benchmark: CPI +3% (Seasonally Adjusted) | 5.0% | 5.2% |
| Diversifying Strategies | -15.2% | 8.1% |
| Benchmark: HFRI Fund of Funds Comp. Index | -4.1% | 7.8% |

Notes:
- Private Equity, Real Estate and Infrastructure are lagged by one quarter
- Custom Private Equity Index is defined as the Burgiss All Private Equity Universe that is weighted by vintage year to generally reflect the anticipated composition of the Fund's private equity program
- Custom Credit Index is defined as 40% Merrill Lynch High Yield Master II Index, 40% Credit Suisse Leveraged Loan Index, 10% JPM EMBI Global Diversified Index and 10% JPM GBI-EM Global DIversified Index

**Contacting the Seattle City Employees' Retirement System**

If you have questions about this report or need additional information, please contact us by telephone at: 206.386.1293 or by e-mail at: retirecity@seattle.gov or you may mail your questions to:

Seattle City Employees' Retirement System
720 Third Avenue, Suite 900
Seattle, WA 98104

# FINANCIAL STATEMENTS

| | 2018 | 2017 |
|---|---|---|
| Assets: | | |
| Cash and Cash Equivalents | $ 61,830,698 | $ 103,480,376 |
| Receivables: | | |
| Members | 4,688,580 | 4,327,168 |
| Employer | 6,298,928 | 5,657,238 |
| Interest and dividends | 4,602,263 | 4,103,031 |
| Sales proceeds receivable | 78,453,081 | 162,413,460 |
| Total receivables | 94,042,852 | 176,500,897 |
| Investments, at fair value: | | |
| Diversifying Strategies | 54,122,799 | 54,513,143 |
| Fixed income | 795,613,929 | 695,691,643 |
| Infrastructure | 24,192,126 | 11,327,253 |
| Private Equity | 224,541,605 | 148,493,888 |
| Public Equity | 1,344,942,198 | 1,614,264,735 |
| Real Estate | 312,205,987 | 304,828,502 |
| Total investments, at fair value | 2,755,618,644 | 2,829,119,164 |
| Securities lending collateral | 4,834,509 | 11,358,941 |
| Total assets | 2,916,326,703 | 3,120,459,378 |
| Liabilities: | | |
| Pensions payable and other | 4,434,144 | 3,321,750 |
| Obligations under securities lending | 4,820,034 | 11,350,612 |
| Investment commitments payable | 189,635,707 | 252,914,451 |
| Total liabilities | 198,889,885 | 267,586,813 |
| **Fiduciary net position held in trust for pension benefits** | $ 2,717,436,818 | $ 2,852,872,565 |

The accompanying notes are an integral part of these financial statements.

## SEATTLE CITY EMPLOYEES' RETIREMENT SYSTEM
## STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION
### Years Ended December 31, 2018 and 2017

| | 2018 | 2017 |
|---|---|---|
| Additions: | | |
| Contributions: | | |
| Employer | $ 117,816,201 | $ 112,102,982 |
| Member | 76,285,206 | 73,650,409 |
| Total contributions | 194,101,407 | 185,753,391 |
| Investment activities: | | |
| Investment income | | |
| Net change in fair value of investments | (143,412,968) | 354,422,933 |
| Interest | 17,458,002 | 13,471,317 |
| Dividends | 20,629,055 | 22,509,987 |
| Other investment income | 11,095,325 | 9,045,351 |
| Net investment income (loss) | (94,230,586) | 399,449,588 |
| Securities lending activities: | | |
| Securities lending income | 205,134 | 133,711 |
| Borrowing rebates | (127,203) | (44,277) |
| Total securities lending income | 77,931 | 89,434 |
| Securities lending management fees | (17,936) | (20,135) |
| Net income from securities lending | 59,995 | 69,299 |
| Investment activity expenses: | (12,398,683) | (11,362,378) |
| Net income/(loss) from investment activities | (106,569,274) | 388,156,509 |
| Total additions | 87,532,133 | 573,909,900 |
| Deductions: | | |
| Benefits | 190,475,464 | 179,226,526 |
| Refunds of contributions | 20,287,842 | 19,158,756 |
| Administrative expenses | 12,204,574 | 11,150,217 |
| Total deductions | 222,967,880 | 209,535,499 |
| Net change | (135,435,747) | 364,374,401 |
| Fiduciary net position held in trust for pension benefits | | |
| Beginning of year | 2,852,872,565 | 2,488,498,164 |
| **End of year** | $ 2,717,436,818 | $ 2,852,872,565 |

The accompanying notes are an integral part of these financial statements.

## Note 1 - Plan Description

The Seattle City Employees' Retirement System (the System) is a multiple employer defined benefit public employee retirement plan, covering employees of the City of Seattle and administered in accordance with Chapter 4.36 of the Seattle Municipal Code. The System is a pension trust fund of the City of Seattle.

The System is administered by the Retirement System Board of Administration (the Board). The Board consists of seven members including the Chair of the Finance Committee of the Seattle City Council, the City of Seattle Finance Director, the City of Seattle Human Resources Director, two active members and one retired member of the System who are elected by other system members, and one outside board member who is appointed by the other six board members. Elected and appointed board members serve for three-year terms.

All employees of the City of Seattle are eligible for membership in the System with the exception of uniformed police and fire personnel who are covered under a retirement system administered by the State of Washington. Employees of METRO and the King County Health Department who established membership in the System when these organizations were City of Seattle departments were allowed to continue their System membership (there are currently fewer than 50 members in this category). There are currently 6,792 retirees and beneficiaries receiving benefits, and 9,390 active members of the System. There are 1,332 terminated, vested employees entitled to future benefits.

The System provides retirement, death, and disability benefits. Retirement benefits vest after five years of credited service, while death and disability benefits vest after ten years of service. Retirement benefits are calculated as 2% multiplied by years of creditable service, multiplied by average salary, based on the highest 24 consecutive months. The benefit is actuarially reduced for early retirement. The System provides post-retirement benefit increase including an automatic 1.5% annual COLA increase and a 65% restoration of purchasing power benefit.

The City of Seattle adopted a second tier for the System in 2016. Starting January 1, 2017, new eligible employees will join this second tier. The tier is a defined benefit plan much like the original tier but has a lower contribution rate for members and calculates final average salary based on the highest 60 consecutive months of service. Other changes related to the new tier can be found in the Seattle Municipal Code 4.36.

## Note 2 - Summary of Significant Accounting Policies and Plan Asset Matters

**Basis of Accounting** - These financial statements have been prepared with an "economic resources" measurement focus on the accrual basis of accounting in accordance with generally accepted accounting principles, as prescribed by the Government Accounting Standards Board.

**Use of Estimates in Preparing Financial Statements -** The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires the System to make estimates and assumptions that affect the reported amounts of assets, liabilities, additions and deductions to net position held in trust for pension benefits and disclosure of contingent assets and liabilities at the date of the financial statements and during the reporting period. Actual results could differ from those estimates.

**Note 2 - Summary of Significant Accounting Policies and Plan Asset Matters** (Continued)

**Cash and Cash Equivalents -** The System classifies cash on deposit in financial institutions and cash on deposit in the City of Seattle's internal cash management pool as cash. The System also recognizes certain short-term highly liquid securities and funds that invest in these securities as cash equivalents.

**Method Used to Value Investments -** Plan investments are reported at fair value. Fair value is defined as the amount at which an investment could be exchanged in a current arm's length transaction between willing parties in which the parties each act knowledgeably and prudently. All investments are valued based on objective, observable, unadjusted quoted market prices in an active market on the measurement date, if available. In the absence of such data, valuations are based upon those of comparable securities in active markets. For illiquid or hard to value investments such as real estate, private equity, and other private investments, valuations are based upon data provided by the respective investment managers. These private asset valuations are generally based upon estimated current values and/or independent appraisals.

Investment income consists of realized and unrealized appreciation (depreciation) in the fair value of investments, interest and dividend income earned, less investment expense, plus income from securities lending activities, less deduction for security lending expenses. Interest income is recorded on the accrual basis and dividends are recorded on the ex-dividend date. Securities and securities transactions are reflected in the financial statements on a trade-date basis.

**Reclassifications –** Certain amounts in the 2017 financial statements have been reclassified to conform with the 2018 presentation. These reclassifications do not affect fiduciary net position as previously reported.

**Federal Income Tax Status -** The System is a qualified plan under section 401(a) of the Internal Revenue Code and is exempt from federal income taxes under section 501(a).

**Contributions** - Employee and employer contributions are reported in the year they are due to the System.

**Benefits and Refunds of Contributions** - Benefits and refunds of contributions are recognized when due and payable in accordance with the System's policy.

**Note 3 - Contributions**

Member and employer contributions rates are established by the Seattle Municipal Code Chapter 4.36.

The employer contribution rate is determined by the actuarial formula identified as the Entry Age Cost Method. The formula determines the amount of contributions necessary to fund the current service cost, representing the estimated amount necessary to pay for benefits earned by the employees during the current service year and the amount of contributions necessary to pay for prior service costs. Total required contributions, including amounts necessary to pay administrative costs, are determined through annual actuarial valuations.

**Note 3 – Contributions** (Continued)

Most members contribute a fixed 10.03% of pay. Minimum actuarially determined employer contribution rates were 14.55% and 14.97% for in 2018 and 2017, respectively, and actual employer contribution rates of 15.23% and 15.29% were adopted for 2018 and 2017, respectively. The City of Seattle adopted a second tier (Tier II) of the System for new eligible employees starting January 1, 2017. These members contributed 7.00% and the City contributed 14.42% in 2018 and 2017.

There are no long-term contracts for contributions outstanding and currently no legally required reserves. See Note 9 for additional information on assumptions used in calculating the actuarially determined contribution rates.

## Note 4 - Cash

SCERS' policy for custodial credit risk of deposits is to rely on Federal Deposit Insurance Corporation (FDIC) and Washington Public Deposit Protection Commission (PDPC) insurance. The FDIC insures the cash deposits up to $250,000. As provided by the State of Washington RCW 43.84, the PDPC collateralizes deposits in excess of $100,000. The bank balances of deposits of an FDIC institution as of the balance sheet date are insured.

## Note 5 - Investments

**Investment policy** - The Board of Administration has established an Investment Policy as required by the Revised Code of Washington (RCW). The Investment Policy guides and assists the Board of Administration in selecting, monitoring and managing System investments to fulfill SCERS's mission and in accordance with the "prudent person" rule established in RCW Section 35.39.060.

The following was the Board's adopted asset allocation policy as of December 31, 2018:

| Asset Class | Target Allocation |
|---|---|
| Equity | |
| Public Equity | 48.0% |
| Private Equity | 9.0% |
| Fixed Income | |
| Core Fixed Income | 16.0% |
| Credit Fixed Income | 7.0% |
| Real Assets | |
| Real Estate | 12.0% |
| Infrastructure | 3.0% |
| Diversifying Strategies | 5.0% |
| **Total** | **100.0%** |

**Note 5 - Investments** (Continued)

**Money-weighted rate of return** – As of December 31, 2018, the return for the System, based on a net-of-fee money-weighted rate of return methodology, was -3.79%. As of December 31, 2017, the return for the System, based on a net-of-fee money-weighted rate of return methodology, was 16.00%.

**Cash and Cash Equivalents** - Cash and Cash Equivalents include a Short-term Investment Fund (STIF), which is a collective trust that may include certificates of deposit, treasury bills, and other short-term highly liquid securities.

**Commingled Funds** – The System invests in various commingled funds where it has an ownership interest in a pool of securities alongside other fund holders. The following tables in this Section reflect the System's direct investment in these commingled funds, rather than the indirect investment in the securities that are held by these funds.

**Custodial Credit Risk** – For investments, custodial credit risk is the risk that in the event of the failure of a financial institution or a bank, the System will not be able to recover the value of its deposits or investments that are in the possession of an outside party. The System mitigates custodial credit risk by having its investment securities held by the System's custodian (BNY Mellon) and registered in the System's name. The System's short-term investments are created through daily sweeps of excess cash by the System's custodian and invested in a vehicle managed by the custodian.

**Credit Risk** - Credit risk is the risk that an issuer, or other counterparty, to an investment will not fulfill its obligations. The Core Fixed Income asset class is primarily allocated to investment-grade securities with low credit risk. The Board provides each of the System's Core Fixed Income investment managers with a set of investment guidelines that include a minimum allocation to investment-grade securities. The Credit Fixed Income asset class is primarily allocated to below investment-grade securities with correspondingly higher credit risk. A summary of the credit ratings of the System's fixed income investments is provided on pages 20 and 21.

**Concentration of Credit Risk** - Concentration of credit risk is the risk of loss attributed to the default of a single issuer. The Board provides each of the System's Core Fixed Income investment managers with a set of investment guidelines that include a maximum allocation to a single issuer in most cases.

**Interest Rate Risk** - Interest rate risk is the risk that changes in interest rates over time will adversely affect the fair value of an investment. Market or interest rate risk is the greatest risk faced by an investor in the fixed income securities market. The price of a fixed income security typically moves in the opposite direction of the change in interest rates. The Board provides each of the System's Core Fixed Income investment managers with a set of investment guidelines that includes a limit on the difference in duration between the portfolio and its applicable benchmark. A summary of the maturities of the System's fixed income investments is provided on pages 18 and 19.

**Foreign Currency Risk** - Foreign currency risk is the risk that changes in exchange rates will adversely impact the fair value of an investment. The System's currency risk exposures, or exchange rate risk, primarily resides within the international holdings of the Public Equity asset class.

**Note 5 - Investments** (Continued)

The System's exposure to foreign currency risk in U.S. dollars as of December 31, 2018, is summarized in the following table.

| Currency Type | Public Equity Securities | Real Estate Funds | Total |
|---|---|---|---|
| AUSTRALIAN DOLLAR | $ 2,964,010 | $ - | $ 2,964,010 |
| CANADIAN DOLLAR | 4,034,019 | - | 4,034,019 |
| DANISH KRONE | 744,511 | - | 744,511 |
| EURO CURRENCY UNIT | 13,661,980 | 839,827 | 14,501,807 |
| HONG KONG DOLLAR | 1,518,525 | - | 1,518,525 |
| ISRAELI SHEKEL | 85,937 | - | 85,937 |
| JAPANESE YEN | 10,583,050 | - | 10,583,050 |
| NEW ZEALAND DOLLAR | 94,858 | - | 94,858 |
| NORWEGIAN KRONE | 356,956 | - | 356,956 |
| POUND STERLING | 7,553,648 | - | 7,553,648 |
| SINGAPORE DOLLAR | 643,872 | - | 643,872 |
| SWEDISH KRONA | 1,209,064 | - | 1,209,064 |
| SWISS FRANC | 3,769,751 | - | 3,769,751 |
| **Total** | $ 47,220,181 | $ 839,827 | $ 48,060,008 |

The System's exposure to foreign currency risk in U.S. dollars as of December 31, 2017, is summarized in the following table.

| Currency Type | Public Equity Securities | Total |
|---|---|---|
| AUSTRALIAN DOLLAR | $ 3,488,650 | $ 3,488,650 |
| CANADIAN DOLLAR | 4,874,861 | 4,874,861 |
| DANISH KRONE | 884,851 | 884,851 |
| EURO CURRENCY UNIT | 16,438,125 | 16,438,125 |
| HONG KONG DOLLAR | 1,687,095 | 1,687,095 |
| ISRAELI SHEKEL | 107,128 | 107,128 |
| JAPANESE YEN | 12,177,697 | 12,177,697 |
| NEW ZEALAND DOLLAR | 75,688 | 75,688 |
| NORWEGIAN KRONE | 402,048 | 402,048 |
| POUND STERLING | 8,991,644 | 8,991,644 |
| SINGAPORE DOLLAR | 655,546 | 655,546 |
| SWEDISH KRONA | 1,394,402 | 1,394,402 |
| SWISS FRANC | 4,101,755 | 4,101,755 |
| **Total** | $ 55,279,490 | $ 55,279,490 |

**Note 5 - Investments** (Continued)

**Derivatives** - The derivatives used by the System typically have no greater risk than their physical counterparts and, in many cases, are offset by exposures elsewhere in the portfolio. Counterparty risk, the risk that the "other party" to a contract will default, is managed by careful screening of counterparties performed by the manager. Derivative securities are priced and accounted for at fair value. Foreign exchange forward contracts are valued at the price at which the transaction could be settled by offsets in the forward markets.

The System's derivative transactions as of December 31, 2018 are summarized in the following table.

| | Unrealized Gain/Loss | | | Notional Value | |
|---|---|---|---|---|---|
| **Type** | **Long Position** | **Short Position** | **Total** | **Long Position** | **Short Position** |
| Futures - Fixed Income | $ 1,031,414 | $ (535,045) | $ 496,369 | $ 62,963,438 | $ (30,709,625) |
| Futures - Equity | (946,679) | - | (946,679) | 52,401,680 | |
| Futures - Cash Equivalents | 54,199 | (146,360) | (92,161) | 27,733,775 | (51,442,388) |
| Options - Fixed Income | (8,468) | 15,826 | 7,358 | N/M | N/M |
| Options - Equity | - | (34,798) | (34,798) | N/M | N/M |
| Swaps - Fixed Income | (870,991) | 51,202 | (819,789) | 135,900,000 | (135,900,000) |
| **Total** | $ (740,525) | $ (649,175) | $ (1,389,700) | | |

N/M - Not Meaningful

The System's derivative transactions as of December 31, 2017 are summarized in the following table.

| | Unrealized Gain/Loss | | | Notional Value | |
|---|---|---|---|---|---|
| **Type** | **Long Position** | **Short Position** | **Total** | **Long Position** | **Short Position** |
| Futures - Fixed Income | $ (492,713) | $ - | $ (492,713) | $ 127,400,063 | $ - |
| Futures - Equity | - | (314,398) | (314,398) | - | (47,816,645) |
| Options - Fixed Income | (20,732) | 10,009 | (10,723) | N/M | N/M |
| Options - Equity | - | (141,491) | (141,491) | N/M | N/M |
| Options - Short-Term | 9,741 | 5,217 | 14,958 | N/M | N/M |
| Swaps - Fixed Income | 437,928 | 133,744 | 571,672 | 109,100,000 | (109,100,000) |
| **Total** | $ (65,776) | $ (306,919) | $ (372,695) | | |

N/M - Not Meaningful

**Note 5 - Investments** (Continued)

As of December 31, 2018, the fixed income portfolio of the System had the following investment maturities:

| | | Investment Maturities (in years) | | | |
|---|---|---|---|---|---|
| **Investment** | **Fair Value** | **<1** | **1 - 5** | **6 - 10** | **>10** |
| Fixed Income Securities | | | | | |
| Agencies | $ 1,934,682 | $ - | $ 1,934,682 | $ - | $ - |
| Asset Backed Security | 57,217,458 | - | 29,976,630 | 23,560,054 | 3,680,774 |
| Corporate Debt | 180,878,639 | 15,527,769 | 106,110,667 | 42,618,159 | 16,622,044 |
| Derivatives | 945,283 | 491,922 | 157,441 | 295,920 | - |
| Mortgage Backed Security | 235,960,890 | - | 3,679,565 | 4,199,268 | 228,082,057 |
| Municipal | 2,816,663 | - | - | - | 2,816,663 |
| Treasury Notes and Bonds | 122,003,076 | 7,925,280 | 35,895,450 | 37,876,039 | 40,306,307 |
| **Total Fixed Income Securities** | $ 601,756,691 | $ 23,944,971 | $ 177,754,435 | $ 108,549,440 | $ 291,507,845 |
| Fixed Income Funds | 193,857,238 | | | | |
| **Total Fixed Income** | $ 795,613,929 | | | | |

**Note 5 - Investments** (Continued)

As of December 31, 2017, the fixed income portfolio of the System had the following investment maturities:

| | | Investment Maturities (in years) | | | |
|---|---|---|---|---|---|
| **Investment** | **Fair Value** | **<1** | **1 - 5** | **6 - 10** | **>10** |
| Fixed Income Securities | | | | | |
| Agencies | $ 1,935,869 | $ - | $ 1,935,869 | $ - | $ - |
| Asset Backed Security | 39,887,331 | - | 18,893,763 | 19,457,546 | 1,536,022 |
| Corporate Debt | 163,057,091 | 21,001,661 | 62,722,599 | 54,219,320 | 25,113,511 |
| Derivatives | 1,568,114 | (492,713) | 2,109,003 | (48,176) | - |
| Foreign Sovereign | 1,569,750 | - | - | 1,569,750 | - |
| Mortgage Backed Security | 180,601,625 | - | 202,608 | 9,472,854 | 170,926,163 |
| Municipal | 4,621,829 | 88,845 | - | 707,798 | 3,825,186 |
| Treasury Notes and Bonds | 110,215,434 | 1,773,712 | 45,569,401 | 32,453,854 | 30,418,467 |
| **Total Fixed Income Securities** | $ 503,457,043 | $ 22,371,505 | $ 131,433,243 | $ 117,832,946 | $ 231,819,349 |
| Fixed Income Funds | 192,234,600 | | | | |
| **Total Fixed Income** | $ 695,691,643 | | | | |

**Note 5 - Investments** (Continued)

As of December 31, 2018, the fixed income portfolio of the System had the following investment ratings:

| | | Ratings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Investment** | **Fair Value** | **AAA** | **AA** | **A** | **BBB** | **BB** | **B** | **CCC& Below** | **Not Rated** |
| Fixed Income Securities | | | | | | | | | |
| Agencies | $ 1,934,682 | $ - | $ 1,934,660 | $ - | $ - | $ - | $ - | $ - | $ 22 |
| Asset Backed Security | 57,217,458 | 40,542,321 | 4,429,690 | - | - | - | - | 352,666 | 11,892,781 |
| Corporate Debt | 180,878,639 | - | 6,290,242 | 53,714,962 | 117,275,097 | 1,053,996 | - | - | 2,544,342 |
| Derivatives | 945,283 | - | - | - | - | - | - | - | 945,283 |
| Mortgage Backed Security | 235,960,890 | 2,760,713 | 105,505,363 | 396,632 | 389,779 | - | - | - | 126,908,403 |
| Municipal | 2,816,663 | 1,133,499 | 697,555 | 985,609 | - | - | - | - | - |
| Treasury Notes and Bonds | 122,003,076 | - | 122,003,076 | - | - | - | - | - | - |
| **Total Fixed Income Securities** | $ 601,756,691 | $ 44,436,533 | $ 240,860,586 | $ 55,097,203 | $ 117,664,876 | $ 1,053,996 | $ - | $ 352,666 | $ 142,290,831 |
| Fixed Income Funds | 193,857,238 | | | | | | | | |
| **Total Fixed Income** | $ 795,613,929 | | | | | | | | |

**Note 5 - Investments** (Continued)

As of December 31, 2017, the fixed income portfolio of the System had the following investment ratings:

| | | Ratings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Investment** | **Fair Value** | **AAA** | **AA** | **A** | **BBB** | **BB** | **B** | **CCC& Below** | **Not Rated** |
| Fixed Income Securities | | | | | | | | | |
| Agencies | $ 1,935,869 | $ - | $ 1,935,623 | $ - | $ - | $ - | $ - | $ - | $ 246 |
| Asset Backed Security | 39,887,331 | 31,743,698 | 1,338,259 | - | - | - | - | 412,693 | 6,392,681 |
| Corporate Debt | 163,057,091 | 873,215 | 11,022,428 | 44,846,261 | 102,320,802 | - | - | - | 3,994,385 |
| Derivatives | 1,568,114 | - | - | - | - | - | - | - | 1,568,114 |
| Foreign Sovereign | 1,569,750 | - | - | - | 1,569,750 | - | - | - | - |
| Mortgage Backed Security | 180,601,625 | 1,816,758 | 80,026,060 | 496,503 | 515,467 | - | - | - | 97,746,837 |
| Municipal | 4,621,829 | 1,185,003 | 732,903 | 1,930,283 | 773,640 | - | - | - | - |
| Treasury Notes and Bonds | 110,215,434 | - | 110,215,434 | - | - | - | - | - | - |
| **Total Fixed Income Securities** | $ 503,457,043 | $ 35,618,674 | $ 205,270,707 | $ 47,273,047 | $ 105,179,659 | $ - | $ - | $ 412,693 | $ 109,702,263 |
| Fixed Income Funds | 192,234,600 | | | | | | | | |
| **Total Fixed Income** | $ 695,691,643 | | | | | | | | |

## Note 6 - Fair Value Measurements

Fair value measurements are categorized within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset:

- Level 1: unadjusted quoted prices for identical instruments in active markets
- Level 2: quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs are observable
- Level 3: significant inputs are unobservable

The following schedule[1] presents investments categorized according to the fair value hierarchy, and is proceeded with additional information regarding investments measured at the net asset value as of December 31, 2018:

| | | Fair Value Measurements Using | | |
|---|---|---|---|---|
| **Investments by fair value level** | **12/31/2018** | **Quoted Prices in Active Markets Identical Assets (Level 1)** | **Significant Other Observable Inputs (Level 2)** | **Significant Unobservable Inputs (Level 3)** |
| Public Equity Securities | $ 637,557,417 | $ 637,796,259 | $ (254,705) | $ 15,863 |
| Fixed Income Securities | 601,756,691 | 122,499,445 | 479,257,246 | - |
| **Total investments by fair value level** | **$ 1,239,314,108** | **$ 760,295,704** | **$ 479,002,541** | **$ 15,863** |
| **Fund Investments measured at the net asset value (NAV)** | | | | |
| Diversifying Strategies | $ 54,122,799 | | | |
| Fixed Income | 193,857,238 | | | |
| Infrastructure | 24,192,126 | | | |
| Private Equity | 224,541,605 | | | |
| Public Equity | 707,384,781 | | | |
| Real Estate | 312,205,987 | | | |
| **Total investments by measured at the NAV** | **$ 1,516,304,536** | | | |
| **Total investments** | **$ 2,755,618,644** | | | |
| **Securities lending collateral** | $ 4,834,509 | | | |

**Fund Investments Measured at the NAV**

| | Fair Value | Unfunded Commitments | Redemption Frequency (if Currently Eligible) | Redemption Notice Period |
|---|---|---|---|---|
| Fixed Income | $ 193,857,238 | $ 39,457,353 | Monthly, N/A | 5 - 30 Days, N/A |
| Diversifying Strategies | 54,122,799 | - | Semi-Monthly | 75 Days |
| Infrastructure | 24,192,126 | 25,655,169 | N/A | N/A |
| Private Equity | 224,541,605 | 422,946,121 | N/A | N/A |
| Public Equity | 707,384,781 | - | Daily, Monthly | 1 - 60 Days |
| Real Estate | 312,205,987 | 73,202,317 | Quarterly, N/A | 45 Days, N/A |
| Total investments measured at the NAV | $ 1,516,304,536 | $ 561,260,960 | | |

[1] Fund investments may consist of underlying securities that are not exclusively in the fund-defined asset class. In other schedules, those securities are categorized based on the asset class of the underlying security rather than the fund.

**Note 6 - Fair Value Measurements** (Continued)

The following schedule presents investments categorized according to the fair value hierarchy, and is proceeded with additional information regarding investments measured at the net asset value as of December 31, 2017:

| | | Fair Value Measurements Using | | |
|---|---|---|---|---|
| **Investments by fair value level** | **12/31/2017** | **Quoted Prices in Active Markets Identical Assets (Level 1)** | **Significant Other Observable Inputs (Level 2)** | **Significant Unobservable Inputs (Level 3)** |
| Public Equity Securities | $ 745,311,783 | $ 745,767,810 | $ (471,890) | $ 15,863 |
| Fixed Income Securities | 503,457,043 | 109,722,721 | 393,734,322 | - |
| **Total investments by fair value level** | **$ 1,248,768,826** | **$ 855,490,531** | **$ 393,262,432** | **$ 15,863** |
| **Fund Investments measured at the net asset value (NAV)** | | | | |
| Diversifying Strategies | $ 54,513,143 | | | |
| Fixed Income | 192,234,600 | | | |
| Infrastructure | 11,327,253 | | | |
| Private Equity | 148,493,888 | | | |
| Real Estate | 304,828,502 | | | |
| Public Equity | 868,952,952 | | | |
| **Total investments by measured at the NAV** | **$ 1,580,350,338** | | | |
| **Total investments** | $ 2,829,119,164 | | | |
| **Securities lending collateral** | $ 11,358,941 | | | |

**Fund Investments Measured at the NAV**

| | Fair Value | Unfunded Commitments | Redemption Frequency (if Currently Eligible) | Redemption Notice Period |
|---|---|---|---|---|
| Fixed Income | $ 192,234,600 | $ 7,726,327 | Monthly, N/A | 5 - 30 Days, N/A |
| Diversifying Strategies | 54,513,143 | - | Semi-Monthly | 75 Days |
| Infrastructure | 11,327,253 | 35,843,707 | N/A | N/A |
| Private Equity | 148,493,888 | 173,808,189 | N/A | N/A |
| Public Equity | 868,952,952 | - | Daily, Monthly | 1 - 60 Days |
| Real Estate | 304,828,502 | 61,905,884 | Quarterly, N/A | 45 Days, N/A |
| Total investments measured at the NAV | $ 1,580,350,338 | $ 279,284,107 | | |

Diversifying Strategies – These investments are structured as a limited partnership with a perpetual life. The redemption frequency is monthly.

Fixed Income – These investments are structured as limited partnerships. The investments include those with a perpetual life and the ability to redeem as well as investments with an approximate life of five years where redemptions are restricted. There are no plans to liquidate the portfolio.

Infrastructure – These investments are structured as limited partnerships or limited liability companies. These investments have an approximate life of ten years where redemptions are restricted. There are no plans to liquidate the portfolio.

**Note 6 - Fair Value Measurements** (Continued)

Private Equity – These investments are structured as limited partnerships or limited liability companies. These investments have an approximate life of ten years where redemptions are restricted. There are no plans to liquidate the portfolio.

Public Equity – These investments are structured as mutual funds, trusts, limited partnerships or limited liability companies. The funds have a perpetual life. Redemption frequencies range from daily to monthly. There are no plans to liquidate the portfolio.

Real Estate – These investments are structured as trusts, limited partnerships or limited liability companies. These investments include those with a perpetual life and the ability to redeem as well as investments with an approximate life of 10 years where redemptions are restricted. There are no plans to liquidate the portfolio.

## Note 7 - Securities Lending Transactions

Through a custodial agent, the System participates in a securities lending program whereby securities are lent for the purpose of generating additional income to the System. The System lends securities from its investment portfolio on a collateralized basis to third parties, primarily financial institutions. The market value of the required collateral must meet or exceed 102% of the market value of the securities lent, providing a margin against a decline in the market value of the collateral, and is limited to a volume of less than $75.0 million. The contractual agreement with the System's custodian provides indemnification in the event the borrower fails to return the securities lent or fails to pay the System income it is due on the securities lent. Cash and U.S. government securities were received as collateral for these loans. The System invests cash collateral received; accordingly, investments made with cash collateral appear as an asset. A corresponding liability is recorded as the System must return the cash collateral to the borrower upon the expiration of the loan. Gross income from securities lending transactions are recorded in the operating statements as well as the various fees paid to the institution that oversees the lending activity.

As of December 31, 2018, the fair value of securities on loan was $4,728,024. Associated cash collateral totaling $4,820,034 was received. The fair market value of the reinvested collateral was $4,834,509 at December 31, 2018, which includes an unrealized gain totaling $14,475.

As of December 31, 2017, the fair value of securities on loan was $11,028,844. Associated cash collateral totaling $11,350,612 was received. The fair market value of the reinvested collateral was $11,358,941 at December 31, 2017, which includes an unrealized gain totaling $8,329.

## Note 8 - Commitments

The System has entered into capital commitments to fund partnership interests in certain alternative investments. At December 31, 2018, the System has unfunded commitments of $561,260,960 to these partnerships.

**Note 9 - Net Pension Liability**

The components of the net pension liability as of December 31, 2018 were as follows:

| | |
|---|---|
| Total Pension Liability | $4,236,680,070 |
| Plan Fiduciary Net Position | 2,717,436,818 |
| Net Pension Liability | $1,519,243,252 |

| | |
|---|---|
| Plan Fiduciary Net Position as a Percentage of the Total Pension Liability | 64.14% |

**Actuarial assumptions**
The total pension liability was determined by an actuarial valuation as of January 1, 2018, using the following actuarial assumptions, applied to all periods including the measurement period:

| | |
|---|---|
| Investment Rate of Return: | 7.25% compounded annually, net of expenses |
| Salary Increases: | 3.50% |
| Inflation: | 2.75% |
| Actuarial Cost Method: | Individual Entry Age Normal |

* The actuarial assumptions that determined the total pension liability as of December 31, 2018 were based on the results of an actuarial experience study for the period January 1, 2014 through December 31, 2017.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Best estimates of geometric real rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2018 (see discussion of pension plan's investment policy) are summarized in the following table:

| Asset Class | Long-Term Expected Real Rate of Return |
|---|---|
| Equity | |
| Public Equity | 5.43% |
| Private Equity | 8.40% |
| Fixed Income | |
| Core Fixed Income | 1.62% |
| Credit Fixed Income | 4.30% |
| Real Assets | |
| Real Estate | 3.90% |
| Infrastructure | 4.25% |
| Diversifying Strategies | 4.01% |

The above table reflects the expected (30 year) real rate of return for each major asset class. The expected inflation rate is projected at 2.75% for the same time period.

**Note 9 - Net Pension Liability** (Continued)

Discount Rate. The discount rate used to measure the total pension liability was 7.25%. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rate and the participating governmental entity contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods on projected benefit payment to determine the total pension liability.

Sensitivity of the net pension liability. The following presents the net pension liability of the System, calculated using the discount rate of 7.25%, as well as what the System's net pension liability would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current rate:

| 1% Decrease (6.25%) | Current Discount Rate (7.25%) | 1% Increase (8.25%) |
|---|---|---|
| $ 2,033,396,310 | $ 1,519,243,252 | $ 1,070,857,158 |

# REQUIRED SUPPLEMENTARY INFORMATION

## SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS

| | December 31, 2018 | December 31, 2017 | December 31, 2016 | December 31, 2015 | December 31, 2014 |
|---|---|---|---|---|---|
| **Total pension liability** | | | | | |
| Service Cost | $ 106,483,390 | $ 112,691,379 | $ 106,450,550 | $ 100,415,811 | $ 94,017,562 |
| Interest | 293,163,397 | 281,360,916 | 268,005,035 | 254,539,867 | 241,885,785 |
| Benefit changes | - | - | - | - | - |
| Difference between expected and actual experience | (12,310,502) | (29,175,591) | (7,653,756) | 1,983,005 | - |
| Changes in assumptions | 100,064,436 | - | - | - | - |
| Benefits payments | (190,475,464) | (179,226,526) | (168,967,298) | (159,349,807) | (150,239,208) |
| Refunds of contributions | (20,287,842) | (19,158,756) | (16,456,570) | (16,137,840) | (15,103,615) |
| Net change in total pension liability | 276,637,415 | 166,491,422 | 181,377,961 | 181,451,036 | 170,560,524 |
| **Total pension liability - beginning** | 3,960,042,655 | 3,793,551,233 | 3,612,173,272 | 3,430,722,236 | 3,260,161,712 |
| **Total pension liability - ending (a)** | 4,236,680,070 | 3,960,042,655 | 3,793,551,233 | 3,612,173,272 | 3,430,722,236 |
| **Plan net position** | | | | | |
| Contributions - employer | 117,816,201 | 112,102,982 | 108,454,496 | 101,153,403 | 89,988,898 |
| Contributions - member | 76,285,206 | 73,650,409 | 71,755,857 | 65,779,216 | 63,969,504 |
| Net investment income | (106,569,274) | 388,156,509 | 189,941,169 | 7,083,633 | 122,510,395 |
| Benefits payments | (190,475,464) | (179,226,526) | (168,967,298) | (159,349,807) | (150,239,208) |
| Administative expense | (12,204,574) | (11,150,217) | (9,250,653) | (8,211,137) | (5,330,764) |
| Refunds of contributions | (20,287,842) | (19,158,756) | (16,456,570) | (16,137,840) | (15,103,615) |
| Net change in plan net position | (135,435,747) | 364,374,401 | 175,477,001 | (9,682,532) | 105,795,210 |
| **Plan net position - beginning** | 2,852,872,565 | 2,488,498,164 | 2,313,021,163 | 2,322,703,695 | 2,216,908,485 |
| **Plan net position - ending (b)** | 2,717,436,818 | 2,852,872,565 | 2,488,498,164 | 2,313,021,163 | 2,322,703,695 |
| **Net pension liability - ending (a) - (b)** | $ 1,519,243,252 | $ 1,107,170,090 | $ 1,305,053,069 | $ 1,299,152,109 | $ 1,108,018,541 |
| **Ratio of plan net position to total pension liability (b) / (a)** | 64.14% | 72.04% | 65.60% | 64.03% | 67.70% |
| **Covered employee payroll** | $ 779,092,412 | $ 733,288,443 | $ 708,600,000 | $ 641,700,000 | $ 630,900,000 |
| **Net pension liability as a percentage of covered-employee payroll** | 195.00% | 150.99% | 184.17% | 202.45% | 175.63% |

*Note: Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.*

## SCHEDULE OF EMPLOYER CONTRIBUTIONS

**Amounts Presented in Millions**

| | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|
| Actuarially determined employer contribution | $ 116.6 | $ 112.1 | $ 107.9 | $ 100.9 | $ 90.3 | $ 77.1 | $ 62.5 | $ 72.3 | $ 93.9 | $ 46.9 |
| Actual employer contributions | 117.8 | 112.1 | 108.5 | 101.2 | 90.0 | 77.1 | 62.5 | 50.3 | 45.2 | 46.7 |
| Annual contribution deficiency (excess) | (1.2) | - | (0.6) | (0.3) | 0.3 | - | - | 22.0 | 48.7 | 0.2 |
| Covered-employee payroll | 779.1 | 733.3 | 708.6 | 641.7 | 630.9 | 597.9 | 567.8 | 557.0 | 563.2 | 580.9 |
| Actual contributions as a percentage of covered-employee payroll | 15.12% | 15.29% | 15.31% | 15.77% | 14.27% | 12.90% | 11.01% | 9.03% | 8.03% | 8.04% |

**Notes to Schedule**:

Valuation Date: Actuarially determined contribution rates are calculated as of January 1, one year prior to the fiscal year in which the contributions will apply.

Methods and assumptions used to determine contribution rates for fiscal year 2018 are:

| | |
|---|---|
| Actuarial cost method | Individual Entry Age Normal |
| Amortization method | Level percent |
| Remaining amortization period | Closed 30 years as of January 1, 2013 valuation |
| Asset valuation method | 5 years smoothed, non-asymptotic |
| Inflation | 2.75% |
| Salary increases | 3.50%, differs slightly from actuarial valuation due to exclusion of 0.50% active membership growth assumption for GASB |
| Investment rate of return | 7.25% |
| Cost of Living Adjustments | Annual compounding COLA of 1.5% assumed. |

| | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Fund | -3.79% | 16.00% | 8.40% | 0.10% | 5.47% | 14.93% | 12.82% | -0.27% | 12.70% | 10.01% |

Note: These returns are calculated on a net-of-fee money-weighted rate of return basis.

# ADDITIONAL INFORMATION

| | Budget | | Actual Expenses | |
|---|---|---|---|---|
| | **2018** | **2018 Revised** | **2018** | **2017** |
| Personnel Services | | | | |
| Salaries | $ 2,840,297 | $ 3,321,362 | $ 3,463,996 | $ 3,212,880 |
| Benefits | 933,843 | 933,843 | 1,214,032 | 1,102,351 |
| Total Personnel Services | 3,774,140 | 4,255,205 | 4,678,028 | 4,315,231 |
| Maintenance and Operations | | | | |
| Professional Services | 941,451 | 1,001,451 | 2,087,731 | 2,168,969 |
| Office Rent | 225,455 | 477,455 | 418,729 | 477,384 |
| Data Processing | 3,609,595 | 8,367,086 | 5,333,865 | 4,689,157 |
| Office Supplies | 230,027 | 305,027 | 441,146 | 353,485 |
| Postage | 56,826 | 56,826 | 50,902 | 48,582 |
| Telephone | 7,342 | 7,342 | 10,860 | 11,010 |
| Travel | 61,884 | 61,884 | 59,639 | 55,688 |
| Training | 19,618 | 19,618 | 36,340 | 11,277 |
| Total Maintenance & Operations | 5,152,198 | 10,296,689 | 8,439,212 | 7,815,552 |
| Total Expenses | $ 8,926,338 | $ 14,551,894 | $ 13,117,240 | $ 12,130,783 |
| Less Internal Investment Expenses | | | $ 912,666 | $ 980,566 |
| Total Administrative Expenses | | | $ 12,204,574 | $ 11,150,217 |

| | |
|---|---|
| Investment Management Fees: | |
| Public Equity | $ 2,811,215 |
| Private Equity | 1,215,415 |
| Fixed Income | 2,027,931 |
| Real Estate | 3,110,099 |
| Infrastructure | 698,688 |
| Diversifying Strategies | 438,332 |
| Other | 222,344 |
| Total Investment Management Fees | $ 10,524,024 |
| True-Up of Prior Year Investment Fees | 365,937 |
| Consulting Services: | |
| NEPC LLC | 295,000 |
| Custodial Services: | |
| Bank of New York Mellon | 301,056 |
| Internal Costs: | 912,666 |
| **Total Investment Expenses** | $ 12,398,683 |
| **Securities Lending Services:** | |
| Bank of New York Mellon | $ 17,936 |

Note:

- Certain investment managers pursue a multi-manager strategy whereby the manager identifies, selects and invests through multiple underlying investment managers. In these instances, the investment fees reflected in the schedule are only those incurred directly by the investment manager of the multi-manager strategy and do not incorporate those fees incurred indirectly by the underlying investment managers.