

ANNUAL REPORT

Democracy depends on Education
Education depends on Teachers

FYE 2019

ST. PAUL TEACHERS' RETIREMENT FUND ASSOCIATION

Annual Report

for the fiscal year ended June 30, 2019

*St. Paul Teachers' Retirement Fund Association
1619 Dayton Avenue, Room 309
Saint Paul, Minnesota 55104-6276*

*Phone 651-642-2550
Fax 651-642-2553
www.sptrfa.org*

Jill E. Schurtz
Executive Director

Christine MacDonald
CFO / Deputy Director

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Mission

Provide our members and their beneficiaries with retirement, survivor, and disability benefits as specified in law and the Association Articles and Bylaws.

Assist our members in planning a secure retirement by providing friendly, high quality, consumer oriented service, pre-retirement education and information in a professional and cost effective manner.

Invest the assets of the fund to provide the optimum return while preserving principal by controlling portfolio risk.

SPTRFA Board of Trustees

| | |
|----------------------|---------------------------|
| John R. Kunz, Jr. | President |
| Mike McCollor | Vice President |
| W. Matt Bogenschultz | Secretary |
| Lori Borgeson | Treasurer |
| Zuki Ellis | <i>Ex-Officio</i> Trustee |
| Thomas Koreltz | Trustee |
| Michael McKay | Trustee |
| Karen A. Odegard | Trustee |
| Stephanie Pignato | Trustee |
| Margaret Schiller | Trustee |

SPTRFA Staff

| | |
|---------------------|------------------------------------|
| Jill E. Schurtz | Executive Director |
| Christine MacDonald | CFO / Deputy Director |
| Nancy Langer | Member Services and Outreach |
| Rachel Pastick | Communications and Member Services |
| Janet Williams | Operations and Member Services |
| Tamera Zielinski | Administrative Assistant |

St. Paul Teachers' Retirement Fund Association

TRUSTEES & OFFICERS

Zuki Ellis
Thomas Koreltz
Michael McKay

Karen Odegard
Stephanie Pignato
Margaret Schiller

John R. Kunz, Jr. President
Mike McCollor Vice President
W. Matthew Bogenschultz .. Secretary
Lori Borgeson..... Treasurer
Jill E. Schurtz Executive Director

1619 Dayton Avenue, Room 309
Saint Paul, MN 55104-6206
Phone (651) 642-2550
Fax (651) 642-2553
Online: www.sptrfa.org

Letter of Transmittal

Members of the Association:

The trustees and staff of the St. Paul Teachers' Retirement Fund Association (SPTRFA) present the Annual Financial Report for the fiscal year ended June 30, 2019, in accordance with the provisions of Minnesota Statutes § 356.20.

This report is intended to provide readers with sufficient information to make informed assessments about the organization's financial condition, fiscal activities, actuarial status, investment performance, and compliance with laws, regulations, bylaws and policies.

This is the complete Annual Report of the Association. This report is also available on the Fund's website at, www.sptrfa.org, or by request from the SPTRFA office.

Major sections included in this report and their content are as follows:

- **Introduction**

Mission Statement, Board of Trustees, professional service relationships, and organizational structure.

- **Benefits**

Summary information regarding Plan benefit options, calculation methods, and a history of annual retirements.

- **Investments**

Fund investment returns, security holdings, and investment advisors under contract with the Association.

- **Actuarial Valuation**

Actuary's Certification Letter and various actuarial valuation sections that assess the Plan's long-term funded status and adequacy of revenues and describe relevant actuarial methods and assumptions.

- **Appendix A – State Auditor's Report**

The Office of the State Auditor (OSA) audits the financial statements of the SPTRFA, and has issued an unmodified opinion on the accuracy and reliability of the information provided by the statements contained in this Report. An unmodified opinion is the most favorable level of opinion that can be rendered by the OSA. This report will be published on the website of the Minnesota Office of the State Auditor, <http://www.osa.state.mn.us>, in January 2020.

The SPTRFA Board and staff are responsible for the safekeeping of the Association's assets, the prudent investment of those assets, and for ensuring that benefits are calculated properly and paid timely. Administrative costs are budgeted at a level sufficient to service the needs of our members. We strive to be service providers of the first order and our administrative costs remain extremely efficient.

The Board and staff of the SPTRFA serve as fiduciaries on behalf of our members and their survivors and beneficiaries. We manage the assets entrusted to our care in concert with the Prudent Person Standard in Minn. Stat. § 356A.04, subd. 2, and as specified under Minn. Stat. § 356A.06, subd. 7.

With over 110 years of service to our members, the SPTRFA Board and staff remain committed to administering the affairs of the Association with the highest degree of diligence and efficiency.

Respectfully submitted,



John R. Kunz, Jr.
President



W. Matt Bogenschultz
Secretary



Lori Borgeson
Treasurer



Jill E. Schurtz
Executive Director

Independent Professional Service Providers

As of June 30, 2019

Actuary

Gabriel Roeder Smith & Company

Auditor

Minnesota Office of the State Auditor

Investment Managers

Allianz Global Investors
Barrow, Hanley, Mewhinney & Strauss, LLC
BlackRock Institutional Trust Co.
Brandywine Global Investment Management, LLC
Dimensional Fund Advisors, LP
Dune Real Estate Partners
EnTrust Global
Franklin Park
Guggenheim Partners Investment Management, LLC
JPMorgan Investment Management, Inc.
Mellon Investments Corp
Morgan Stanley Investment Management, Inc.
North Sky Capital
Parametric Portfolio Associates, LLC
RWI Ventures I
Securian Asset Management, Inc.
Minnesota State Board of Investment
TCW Asset Management Co.
Tortoise Capital Advisors, LLC
UBS Realty Investors, LLC
Venture Investment Associates
Wellington Management Company, LLP

Investment Custodian

U.S. Bank

Investment Performance Consultant

Asset Consulting Group

IT Services

Sagitec
Corporate Technologies

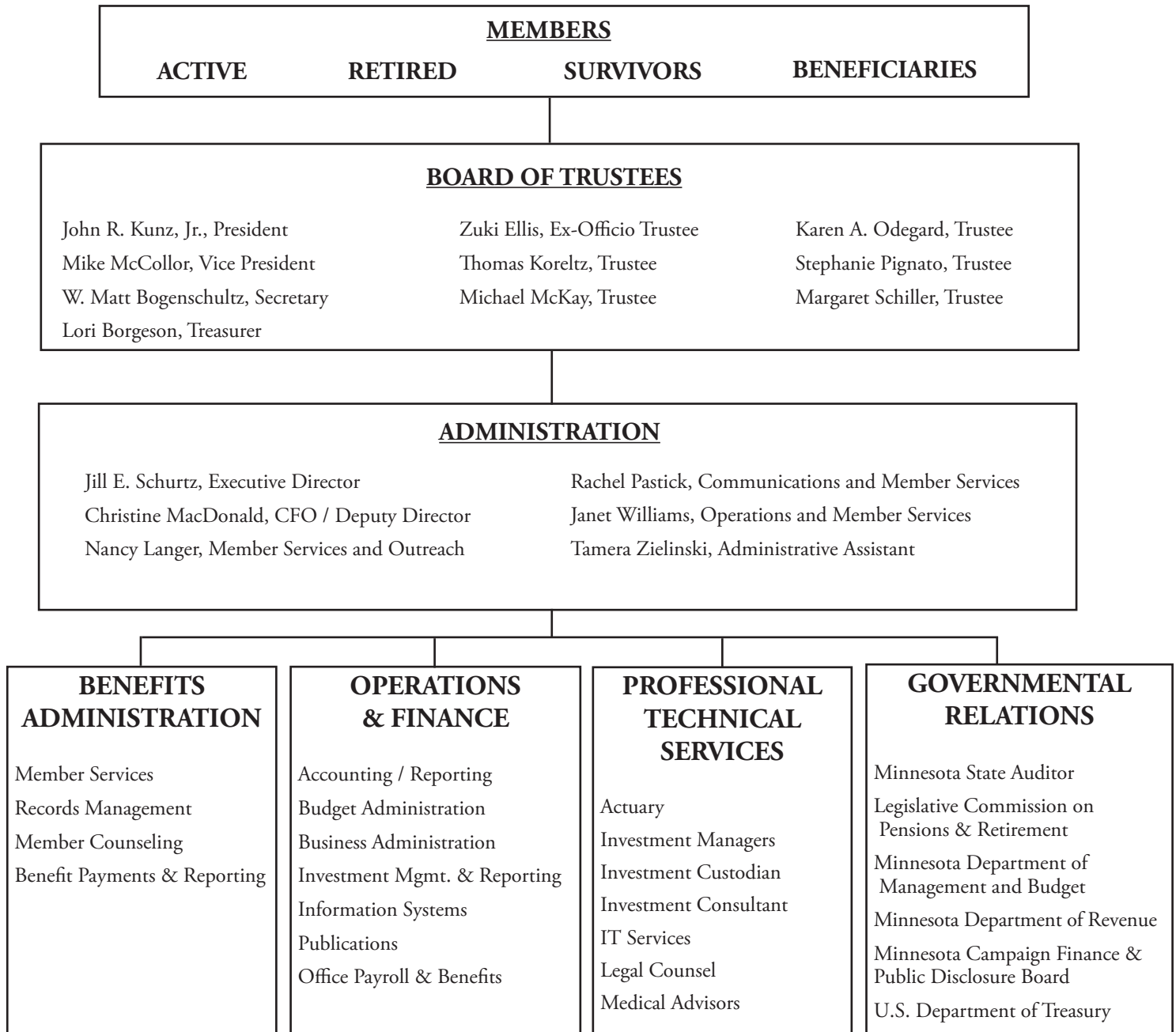
Legal Counsel

Fox Rothschild, LLC
Rice, Michels & Walther, LLP

Medical Advisors

Dr. Ronald Vessey M.D.
Dr. David Johnson M.D.

Organizational Chart



BENEFITS

Pre-Retirement Topics

| | |
|--|--|
| Membership | SPTRFA membership is mandatory upon employment in any position requiring a license issued by the MN Professional Educator Licensing and Standards Board for employment with Saint Paul Public Schools (SPPS), St. Paul College (SPC) – if you were first employed prior to July 1, 1995, or St. Paul Charter Schools – from July 1, 1995 through June 30, 2002. Hereinafter collectively referred to as “Saint Paul Schools.” |
| Allowable Retirement Service Credit | A full year of retirement service credit is earned after 170 days are worked during each fiscal year. Partial years are calculated based on the ratio of days worked to 170 days. No more than one year of retirement service credit is allowable during any fiscal year. |
| Definition of Salary | Minnesota Statutes Chapter 354A and the Association Articles and Bylaws define salary as the entire compensation upon which member contributions are required and made. |
| Refund of Contributions | Coordinated and Basic members who resign from St. Paul Schools may apply for a refund of employee contributions, plus applicable interest. Basic Plan members must be either under Age 55 or ineligible for a pension to receive a refund of contributions. |
| Repaying a Refund of Contributions | A member who received a refund may reinstate previous retirement service credit by repaying the amount refunded plus applicable interest. Such repayments may only be made after the member has accumulated at least two years of allowable retirement service credit since the last refund was taken. |
| Leaves of Absence | Subject to certain requirements, members may purchase retirement service credit for the following Saint Paul Schools approved leaves of absence: Sabbatical, Military, Parental, Mobility, Medical, and Family Medical. |
| Service Payments | Members may repay refunds or purchase SPTRFA retirement service credit by using personal savings or by transferring money from their Roth IRA or tax-sheltered retirement accounts, such as 403(b), 457, 401(k), IRAs, or from another plan qualified under 401(a). |
| Beneficiary | A beneficiary is the person or persons designated to receive a refund of employee contributions, plus applicable interest, upon the death of the member if no survivor or family benefit is payable. If no valid beneficiary designation form is on file for a member, a refund of contributions plus applicable interest will be paid to the member's estate. |
| Marriage Dissolution | Minnesota Statutes Chapter 518 covers marriage dissolutions and requires that SPTRFA receive a copy of the petition and summons, including a copy of the affidavit of service, before any information may be released. In the event that a court order requires a division of pension benefits, a judge signed copy of a decree or domestic relations order is required. All inquiries are kept confidential. Any survivor benefit coverage ends at the dissolution of marriage. |
| Disability Benefit | Subject to certain requirements, a disability benefit is available to vested members who become totally and permanently disabled. |

Retirement Topics

Basic Plan Retirement Options

Basic Plan members receive a formula benefit payable for life. An automatic spousal survivor benefit is also provided. This survivor benefit coverage does not cause a reduction in the member's benefit, but does terminate at any dissolution of marriage.

Coordinated Plan Retirement Options

At the time of retirement, Coordinated Plan members select one of the five benefit annuity options below:

C1 Member Life Only

Monthly benefit payable for life to the member, with nothing payable after the member's death.

C2 Guaranteed Refund

Reduced monthly benefit payable for life to the member. In exchange for the member's benefit reduction, after the member's death, SPTRFA pays a refund to a designated beneficiary. The refund is equal to the difference between SPTRFA pre-retirement member contributions less cumulative SPTRFA post-retirement benefits paid to the member prior to death.

C3 15-Year Certain

Reduced monthly benefit payable for life to the member. In exchange for the member's benefit reduction, SPTRFA continues monthly payments to a beneficiary if the member's death occurs within 15 years after retirement. Beneficiary payments end after the balance of the 15 years of SPTRFA benefit payments (member and beneficiary combined) is fulfilled.

C4 100% Joint & Survivor

Reduced monthly benefit payable for life to the member. In exchange for the member's benefit reduction, after the member's death, the member's spouse receives the same monthly benefit for life. If the spouse predeceases the member, the member's benefit would bounceback to the full, unreduced benefit amount payable under the C1 option. Survivor benefit coverage ends at any dissolution of marriage.

C5 50% Joint & Survivor

Reduced monthly benefit payable for life to the member. In exchange for the member's benefit reduction, after the member's death, the member's spouse receives 50% of the member's benefit as a monthly benefit for life. If the spouse predeceases the member, the member's benefit would bounceback to the full, unreduced benefit amount payable under the C1 option. Survivor benefit coverage ends at any dissolution of marriage.

Post-Retirement Topics

Post-Retirement SPPS Reemployment

If a retired member is reemployed by SPPS prior to Age 65, their SPTRFA monthly benefits will be reduced if the retired member earns more than \$46,000 from SPPS in any calendar year. The following year's pension will be reduced by one dollar for every three dollars in SPPS earnings over \$46,000, with the amount of the reduction forfeited to SPTRFA. After age 65, retired members have no SPPS re-employment earnings limitation. Retired members can work for any other employer without a reduction in their SPTRFA pension benefits.

90 Day Period of Separation

Newly retired members must have a complete and continuous 90 day separation from Saint Paul Schools employment in any form. Importantly, "employment" for this purpose includes "any service provided to Saint Paul Schools directly, as an independent contractor, or as an employee of an independent contractor."

Post-Retirement Adjustment

Post-retirement adjustments are determined annually under Minnesota statutes, which may be amended from time to time. For FY2019 post-retirement adjustments were decreased from 1% to 0%.

The postretirement benefit increase applies to each eligible member on January 1 of each year. Members in retirement payment status for at least one full year will receive the full increase noted above. Members in retirement payment status after January 1st but on or before July 1st of the preceding year will receive one-half of the full increase.

Basic Plan - Summary of Benefits **

Vested members of the Basic Plan are eligible to receive a lifetime monthly pension based on the member's Final Average Salary (FAS), Years of Service (YOS) and a Percentage Multiplier.

The following chart provides an overview of the Tier 1 and Tier 2 retirement benefits in effect for eligible Basic Plan members during FY2019.

| Normal Benefit | Minimum | | Computation of Annual Benefit |
|-------------------|------------|---------|--|
| | Age | Service | |
| Tier 1 | | | |
| Unreduced | Rule of 90 | | } FAS x YOS x 2.0% |
| | 60 | 25 | |
| | 65 | 5 | |
| Reduced | 55 | 5 | Reduced for early retirement by 0.25% for each month a member's age is under 65. |
| | 55 | 25 | Reduced for early retirement by 0.25% for each month a member's age is under 60. |

Tier 2

| | | | |
|-----------|----|---|--|
| Unreduced | 65 | 5 | FAS x YOS x 2.5% |
| Reduced | 55 | 5 | Formula reduced for early retirement by the use of actuarial tables. |

Deferred Retirement

| | | | |
|---|----|---|--|
| | 55 | 5 | Annual Benefit (see above) with augmentation.* |
| <p>* Augmented by 3% per year from date of resignation to January 1 after reaching Age 55, then 5% per year thereafter, if first hired prior to July 1, 2006.</p> <p>Augmented by 2.5% for all years if first hired on or after July 1, 2006.</p> <p>Augmentation for all members, regardless of hire date, changed to 2% as of July 1, 2012 for the portion of benefit deferral occurring after June 30, 2012.</p> <p>Augmentation was eliminated as of July 1, 2019, for the portion of benefit deferral occurring after June 30, 2019.</p> | | | |

** Please note that effective FY2020, there are no remaining Basic Plan members in active status.

Coordinated Plan - Summary of Benefits

Vested members of the Coordinated Plan are eligible to receive a lifetime monthly pension based on the member's Final Average Salary (**FAS**), Years of Service (**YOS**) and a Percentage Multiplier. Members first hired after June 30, 1989 are only eligible for Tier 2 benefits.

The following chart provides an overview of the Tier 1 and Tier 2 retirement benefits in effect for eligible Coordinated Plan members during FY2019.

| Normal Benefit | Minimum | | Computation of Annual Benefit |
|-------------------|------------|---------|--|
| | Age | Service | |
| Tier 1 | | | |
| Unreduced | Rule of 90 | | <div><div>(FAS x First 10 YOS x Multiplier*)</div><div>+</div><div>(FAS x YOS greater than 10 x Multiplier*)</div></div> |
| | 62 | 30 | |
| | 65 | 3 | |
| Reduced | 55 | 3 | Reduced for early retirement by 0.25% for each month a member’s age is under 65. |
| | Any Age | 30 | Reduced for early retirement by 0.25% for each month a member’s age is under 62. |

| | | |
|--------------------------------|---------------------|--------------------|
| *Tier 1 Multipliers | First 10 YOS | Over 10 YOS |
| Service Prior to July 1, 2015 | 1.2% | 1.7% |
| Service Effective July 1, 2015 | 1.4% | 1.9% |

Tier 2

| | | | |
|-----------|---|---|--|
| Unreduced | If first employed before July 1, 1989: | | |
| | 65 | 3 | FAS x YOS x Multiplier* |
| | If first employed on or after July 1, 1989: | | |
| | 66 | 3 | FAS x YOS x Multiplier* |
| Reduced | 55 | 3 | Reduced for early retirement by the use of actuarial tables. |

| | | |
|----------------------------|--------------------------------|------|
| *Tier 2 Multipliers | Service Prior to July 1, 2015 | 1.7% |
| | Service Effective July 1, 2015 | 1.9% |

Deferred Retirement

| | | |
|---------|----|--|
| 55 | 3 | Annual Benefit (see above) with augmentation.* |
| Any Age | 30 | |

* Augmented by 3% per year from date of resignation to January 1 after reaching Age 55, then 5% per year thereafter, if first hired prior to July 1, 2006.

Augmented by 2.5% for all years if first hired on or after July 1, 2006.

Augmentation for all members, regardless of hire date, changed to 2% as of July 1, 2012 for the portion of benefit deferral occurring after June 30, 2012.

Augmentation was eliminated as of July 1, 2019, for the portion of benefit deferral occurring after June 30, 2019.

Retirement History Record

| Fiscal Year Ending | Pensions Granted | Persons On Payroll | Benefits Paid (\$) | Fiscal Year Ending | Pensions Granted | Persons On Payroll | Benefits Paid (\$) |
|--------------------|---------------------|-----------------------|-----------------------|--------------------|---------------------|-----------------------|-----------------------|
| June 1910 | 15 | 13 | \$ 4,860 | December 1975 | 52 | 778 | \$ 3,765,322 |
| June 1931 | 8 | 125 | 69,024 | December 1976 | 77 | 883 | 4,393,513 |
| June 1932 | 8 | 130 | 72,961 | December 1977 | 63 | 919 | 5,050,507 |
| June 1933 | 2 | 126 | 74,190 | December 1978 | 48 | 946 | 5,523,548 |
| June 1934 | 6 | 127 | 74,120 | December 1979 | 40 | 946 | 6,240,309 |
| June 1935 | 9 | 131 | 74,001 | December 1980 | 47 | 963 | 6,623,804 |
| June 1936 | 14 | 135 | 75,864 | December 1981 | 47 | 981 | 7,139,037 |
| June 1937 | 19 | 151 | 80,747 | December 1982 | 61 | 996 | 7,725,617 |
| June 1938 | 17 | 160 | 89,709 | December 1983 | 72 | 1,042 | 8,555,099 |
| June 1939 | 11 | 161 | 93,184 | December 1984 | 64 | 1,061 | 9,466,664 |
| June 1939 to | | | | January 1985 to | | | |
| December 1939 | 0 | 158 | 23,870 | June 1985 | 59 | 1,103 | 5,324,727 |
| December 1940 | 71 | 222 | 170,685 | June 1986 | 66 | 1,134 | 11,267,144 |
| December 1941 | 35 | 246 | 210,257 | June 1987 | 117 | 1,191 | 12,478,180 |
| December 1942 | 27 | 266 | 234,217 | June 1988 | 70 | 1,210 | 14,690,455 |
| December 1943 | 38 | 286 | 253,031 | June 1989 | 67 | 1,236 | 15,506,957 |
| December 1944 | 34 | 311 | 282,299 | June 1990 | 67 | 1,270 | 17,382,410 |
| December 1945 | 56 | 350 | 308,113 | June 1991 | 80 | 1,309 | 18,811,677 |
| December 1946 | 51 | 378 | 337,512 | June 1992 | 83 | 1,357 | 20,509,335 |
| December 1947 | 28 | 387 | 360,571 | June 1993 | 120 | 1,426 | 22,763,806 |
| December 1948 | 42 | 413 | 375,912 | June 1994 | 92 | 1,469 | 25,044,494 |
| December 1949 | 42 | 441 | 419,618 | June 1995 | 113 | 1,539 | 26,792,534 |
| December 1950 | 30 | 461 | 450,641 | June 1996 | 119 | 1,595 | 29,446,215 |
| December 1951 | 27 | 476 | 472,670 | June 1997 | 179 | 1,720 | 32,056,967 |
| December 1952 | 28 | 486 | 508,923 | June 1998 | 129 | 1,789 | 37,852,099 |
| December 1953 | 32 | 487 | 525,959 | June 1999 | 114 | 1,861 | 41,724,751 |
| December 1954 | 10 | 482 | 529,429 | June 2000 | 144 | 1,964 | 47,121,179 |
| December 1955 | 38 | 509 | 666,994 | June 2001 | 130 | 2,050 | 53,851,893 |
| December 1956 | 46 | 529 | 750,146 | June 2002 | 127 | 2,136 | 58,738,724 |
| December 1957 | 59 | 560 | 840,883 | June 2003 | 126 | 2,248 | 63,357,052 |
| December 1958 | 41 | 579 | 1,019,502 | June 2004 | 141 | 2,361 | 67,941,921 |
| December 1959 | 30 | 585 | 1,084,506 | June 2005 | 192 | 2,505 | 72,448,201 |
| December 1960 | 38 | 600 | 1,144,380 | June 2006 | 146 | 2,624 | 78,420,222 |
| December 1961 | 39 | 611 | 1,230,715 | June 2007 | 138 | 2,744 | 82,809,201 |
| December 1962 | 49 | 624 | 1,352,779 | June 2008 | 122 | 2,851 | 88,273,233 |
| December 1963 | 42 | 647 | 1,467,461 | June 2009 | 114 | 2,933 | 92,137,480 |
| December 1964 | 33 | 653 | 1,545,252 | June 2010 | 166 | 3,044 | 95,299,300 |
| December 1965 | 40 | 668 | 1,631,554 | June 2011 | 233 | 3,212 | 97,264,937 |
| December 1966 | 43 | 676 | 1,770,083 | June 2012 | 141 | 3,292 | 101,989,143 |
| December 1967 | 36 | 682 | 1,862,249 | June 2013 | 166 | 3,404 | 103,237,869 |
| December 1968 | 45 | 695 | 1,969,760 | June 2014 | 177 | 3,529 | 105,742,221 |
| December 1969 | 53 | 726 | 2,319,186 | June 2015 | 178 | 3,633 | 108,877,858 |
| December 1970 | 31 | 719 | 2,385,868 | June 2016 | 159 | 3,723 | 111,223,711 |
| December 1971 | 47 | 731 | 2,522,350 | June 2017 | 190 | 3,851 | 112,750,820 |
| December 1972 | 51 | 745 | 2,742,660 | June 2018 | 138 | 3,914 | 115,315,754 |
| December 1973 | 36 | 744 | 3,039,253 | June 2019 | 154 | 4,007 | 116,389,114 |
| December 1974 | 46 | 754 | 3,372,453 | | | | |

INVESTMENTS

Investment Returns for Fiscal Year End June 30, 2019

| | Assets Under Management (Market Value) | Fiscal Year Investment Performance |
|--|---|---|
| Domestic Equity | | |
| Barrow, Hanley, Mewhinney & Strauss, Inc. | 51,205,883 | 8.49% |
| BlackRock S&P 500 | 11,175,555 | 10.48% |
| Mellon Investments Corp. | 38,779,788 | -7.82% |
| Dimensional Fund Advisors, Inc. | 39,721,020 | -10.90% |
| State Board of Investments - Domestic Equity | 250,955,475 | 9.00% |
| Wellington Management Company, LLP | 53,067,473 | 16.08% |
| | \$ 444,905,194 | |
| International Equity | | |
| State Board of Investments - Int'l Equity | 72,870,932 | 1.37% |
| | \$ 72,870,932 | |
| Global Equity | | |
| BlackRock iShares ETF | 6,828,074 | 0.91% |
| Morgan Stanley Global Franchise | 77,154,362 | 16.49% |
| JP Morgan Focus | 212,942 | |
| | \$ 84,195,378 | |
| Fixed Income | | |
| Brandywine Global Opportunistic Fixed | 37,351,252 | 4.88% |
| Allianz Cash Overlay | 33,117,586 | 4.86% |
| Guggenheim Core Plus | 99,614,150 | 5.74% |
| | \$ 170,082,988 | |
| Real Assets | | |
| Securian | 27,489,704 | 10.87% |
| UBS Trumbull Fund | 36,673,517 | 0.08% |
| UBS Growth & Income Fund | 18,477,742 | 11.18% |
| Tortoise MLP | 18,318,691 | 1.29% |
| Dune Realty Partners | 5,371,903 | 11.53% |
| Parametric - TIPS | 9,233,302 | 4.15% |
| | \$ 115,564,859 | |
| Private Equity | | |
| Edgewave | 11,115 | |
| Franklin Park | 55,007,522 | |
| North Sky | 5,015,626 | |
| RWI Ventures I | 226,333 | |
| TCW LLC | 6,153,448 | |
| VIA Partners | 2,732,833 | |
| | \$ 69,146,877 | 16.87% |
| Alternatives | | |
| Parametric Defensive Equity | 30,635,524 | 4.89% |
| | \$ 30,635,524 | |
| Opportunistic | | |
| Entrust | 16,801,538 | -0.54% |
| | \$ 16,801,538 | |
| Cash | | |
| Cash - US Bank Custody | 49,101,943 | 1.95% |
| Cash - US Bank Checking | 10,529,964 | |
| Parametric Cash Overlay | 9,258,030 | 5.97% |
| | \$ 68,889,937 | |
| Total Fund (net of fees) | \$ 1,073,093,227 | 5.73% |
| Total Fund Benchmark | | 6.80% |

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2019

| Asset Class / Security Type / Issuer | Cost | Market Value | Accrued Interest or Dividends | Mkt + Accrued |
|---|----------------------|----------------------|----------------------------------|----------------------|
| Cash or Equivalents | | | | |
| U.S. Bank Commercial Paper Sweep & Cash | \$ 10,529,964 | \$ 10,529,964 | \$ - | \$ 10,529,964 |
| Custodian Short Term Investment Pool | 71,583,515 | 71,596,793 | - | 71,596,793 |
| Subtotal - Cash or Equivalents | <u>\$ 82,113,479</u> | <u>\$ 82,126,757</u> | <u>\$ -</u> | <u>\$ 82,126,757</u> |
| Domestic Equity Securities | | | | |
| 2U Inc | \$ 361,017 | \$ 162,605 | \$ - | \$ 162,605 |
| Acadia Healthcare Co Inc | 380,973 | 242,448 | - | 242,448 |
| Adtalem Global Education Inc | 350,336 | 343,056 | - | 343,056 |
| Advance Auto Parts Inc | 1,591,753 | 1,534,464 | 549 | 1,535,012 |
| Advanced Micro Devices Inc | 327,026 | 706,103 | - | 706,103 |
| Aerie Pharmaceuticals Inc | 483,348 | 292,309 | - | 292,309 |
| Agree Realty Corp | 321,794 | 409,920 | 3,648 | 413,568 |
| Air Prods Chemicals Inc | 1,129,982 | 2,050,007 | 10,505 | 2,060,512 |
| Alexandria Real Estate Equities Inc | 703,644 | 910,736 | 6,455 | 917,191 |
| Ally Financial Inc | 197,406 | 249,408 | - | 249,408 |
| American Express Co | 480,549 | 1,065,411 | - | 1,065,411 |
| American Homes 4 Rent A | 415,850 | 454,597 | 935 | 455,532 |
| American International Group | 1,886,835 | 1,846,578 | - | 1,846,578 |
| Andeavor Logistics Lp | 734,813 | 506,150 | - | 506,150 |
| Antero Midstream Corp | 844,746 | 608,984 | - | 608,984 |
| Anthem Inc | 286,169 | 778,053 | - | 778,053 |
| Apartment Invt Mgmt Co A | 471,473 | 471,128 | - | 471,128 |
| Aramark | 1,738,331 | 1,680,144 | - | 1,680,144 |
| Aramark | 1,281,235 | 1,435,585 | - | 1,435,585 |
| Autodesk Inc | 191,395 | 440,319 | - | 440,319 |
| Avalonbay Cmnty Inc | 1,210,782 | 1,462,896 | 10,944 | 1,473,840 |
| Black Knight Inc | 650,507 | 856,476 | - | 856,476 |
| Blackbaud Inc | 891,765 | 943,216 | - | 943,216 |
| Bluebird Bio Inc | 822,846 | 776,683 | - | 776,683 |
| Boston Ppty Inc | 1,099,208 | 1,132,491 | 8,340 | 1,140,831 |
| Bottomline Technologies Del Inc | 198,588 | 197,664 | - | 197,664 |
| Bp Midstream Partners L P | 176,490 | 154,041 | - | 154,041 |
| Bp Plc Spon A D R | 1,029,805 | 951,302 | - | 951,302 |
| Bright Horizons Family Solut | 1,167,139 | 1,775,740 | - | 1,775,740 |
| Burlington Stores Inc | 1,367,768 | 1,531,180 | - | 1,531,180 |
| Bwx Technologies Inc | 1,276,214 | 1,152,608 | - | 1,152,608 |
| Cabot Corp | 516,920 | 406,919 | - | 406,919 |
| Cabot Oil Gas Corp Cl A | 599,334 | 573,105 | - | 573,105 |
| Camden Ppty Tr Sbi | 593,499 | 688,974 | 5,280 | 694,254 |
| Cardinal Health Inc | 437,824 | 315,806 | 3,226 | 319,031 |
| Cardtronics Plc | 548,642 | 462,582 | - | 462,582 |
| Cdw Corp De | 350,973 | 1,021,977 | - | 1,021,977 |
| Centene Corp | 538,744 | 621,152 | - | 621,152 |
| Ceridian Hcm Holding Inc | 394,534 | 547,431 | - | 547,431 |
| Cheniere Energy Inc | 356,288 | 377,160 | - | 377,160 |
| Cheniere Energy Inc | 361,028 | 415,423 | - | 415,423 |
| Chevron Corporation | 188,750 | 490,294 | - | 490,294 |
| Ciena Corp | 245,284 | 488,049 | - | 488,049 |
| Cigna Corp | 1,334,862 | 758,918 | - | 758,918 |
| Clarivate Analytics Plc | 304,001 | 315,444 | - | 315,444 |
| Clearway Energy Inc C | 193,661 | 209,266 | - | 209,266 |
| Cloudera Inc | 636,863 | 260,649 | - | 260,649 |
| Coherent Inc | 403,381 | 387,973 | - | 387,973 |
| Colliers International Group | 76,051 | 77,923 | 54 | 77,977 |
| Comcast Corp Class A | 1,604,072 | 1,871,905 | - | 1,871,905 |
| Commvault Systems Inc | 348,675 | 291,369 | - | 291,369 |
| Coresite Realty Corp | 439,555 | 456,419 | 4,835 | 461,254 |

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2019

| Asset Class / Security Type / Issuer | Cost | Market Value | Accrued Interest or Dividends | Mkt + Accrued |
|--------------------------------------|-----------|--------------|----------------------------------|---------------|
| Corteva Inc | 1,374,877 | 1,485,774 | - | 1,485,774 |
| Cousins Properties Inc | 110,677 | 112,127 | - | 112,127 |
| Covanta Hldg Corp | 433,049 | 506,172 | 7,066 | 513,238 |
| Criteo Sa Spon A D R | 534,891 | 343,081 | - | 343,081 |
| Cubsmart | 132,608 | 143,792 | 1,376 | 145,168 |
| Cvs Health Corp | 1,770,575 | 1,196,600 | - | 1,196,600 |
| Darling Ingredients Inc | 575,122 | 558,392 | - | 558,392 |
| Dave Busters Entertainmen | 597,696 | 469,128 | 1,739 | 470,867 |
| Dcp Midstream Lp | 110,161 | 79,051 | - | 79,051 |
| Deere Co | 503,085 | 600,864 | 2,756 | 603,620 |
| Delek Holdco Inc | 382,527 | 422,826 | - | 422,826 |
| Delphi Technologies Plc | 324,709 | 225,080 | - | 225,080 |
| Dexcom Inc | 95,338 | 245,138 | - | 245,138 |
| Digital Realty Trust Inc | 989,291 | 1,024,773 | - | 1,024,773 |
| Docusign Inc | 709,403 | 744,109 | - | 744,109 |
| Dollar General Corp | 841,819 | 1,550,150 | - | 1,550,150 |
| Dominion Energy Inc | 1,105,955 | 1,261,012 | - | 1,261,012 |
| Dominos Pizza Inc | 491,190 | 694,030 | - | 694,030 |
| Douglas Emmitt Inc | 498,440 | 482,542 | 3,149 | 485,691 |
| Douglas Emmitt Inc | 470,682 | 517,920 | 3,380 | 521,300 |
| Dow Inc | 608,307 | 507,696 | - | 507,696 |
| Duke Realty Corporation | 799,753 | 989,393 | - | 989,393 |
| Dupont De Nemours Inc Wi | 1,185,875 | 1,003,536 | - | 1,003,536 |
| E O G Res Inc | 1,215,464 | 1,191,982 | - | 1,191,982 |
| E Trade Financial Corp | 124,409 | 349,084 | - | 349,084 |
| Eagle Materials Inc | 913,349 | 840,233 | 906 | 841,139 |
| Edwards Lifesciences Corp | 289,018 | 553,851 | - | 553,851 |
| Elanco Animal Health Inc | 1,471,186 | 1,604,114 | - | 1,604,114 |
| Electronic Arts Inc | 167,301 | 206,975 | - | 206,975 |
| Energy Transfer Equity L P | 2,099,164 | 1,720,351 | - | 1,720,351 |
| Enlink Midstream Llc | 267,447 | 283,912 | - | 283,912 |
| Enterprise Products Partners | 1,706,994 | 1,770,482 | - | 1,770,482 |
| Eqm Midstream Partners Lp | 1,433,041 | 962,228 | - | 962,228 |
| Equifax Inc | 594,636 | 818,608 | - | 818,608 |
| Equifax Inc | 494,186 | 578,827 | - | 578,827 |
| Equinix Inc | 1,217,018 | 1,610,198 | - | 1,610,198 |
| Equity Lifestyle Pptys Inc | 96,610 | 133,474 | 674 | 134,148 |
| Equity Residential | 618,820 | 736,424 | 5,505 | 741,929 |
| Essex Property Trust Inc | 595,055 | 786,459 | 5,253 | 791,713 |
| Etsy Inc | 198,610 | 248,610 | - | 248,610 |
| Euronav Nv | 383,598 | 401,238 | - | 401,238 |
| Exelon Corporation | 949,257 | 1,176,400 | - | 1,176,400 |
| Expedia Inc | 1,268,045 | 1,521,730 | - | 1,521,730 |
| Extended Stay America Inc | 755,939 | 717,859 | - | 717,859 |
| Extra Space Storage Inc | 337,127 | 477,450 | - | 477,450 |
| F M C Corporation | 353,294 | 383,312 | 1,848 | 385,160 |
| First Bancorp Puerto Rico | 507,171 | 580,660 | - | 580,660 |
| First Interstate Bancsys Mt | 204,384 | 223,638 | - | 223,638 |
| First Republic Bank San Fran | 548,733 | 674,371 | - | 674,371 |
| First Solar Inc | 435,740 | 500,153 | - | 500,153 |
| First Solar Inc | 320,852 | 388,891 | - | 388,891 |
| Flex Ltd | 1,261,597 | 780,654 | - | 780,654 |
| Flir Systems Inc | 75,675 | 76,714 | - | 76,714 |
| Fluor Corp | 194,160 | 134,423 | 838 | 135,261 |
| Four Corners Property Trust | 375,717 | 399,018 | 4,198 | 403,216 |
| Gartner Inc | 1,377,003 | 2,117,809 | - | 2,117,809 |
| General Electric Co | 1,912,244 | 973,508 | 927 | 974,435 |

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2019

| Asset Class / Security Type / Issuer | Cost | Market Value | Accrued Interest or | |
|--------------------------------------|-----------|--------------|---------------------|---------------|
| | | | Dividends | Mkt + Accrued |
| Global Payments Inc | 725,876 | 1,676,561 | - | 1,676,561 |
| Godaddy Inc Class A | 754,359 | 692,521 | - | 692,521 |
| Grand Canyon Education Inc | 567,884 | 854,831 | - | 854,831 |
| Green Dot Corp Cl A | 690,554 | 521,274 | - | 521,274 |
| Greensky Inc Class A | 316,780 | 278,811 | - | 278,811 |
| Guidewire Software Inc | 518,560 | 828,477 | - | 828,477 |
| Hcp Inc | 699,509 | 857,064 | - | 857,064 |
| Healthcare Trust Of Ame Cl A | 488,902 | 480,025 | - | 480,025 |
| Hexcel Corp New | 903,382 | 1,362,504 | - | 1,362,504 |
| Highwoods Properties Inc | 463,653 | 446,040 | - | 446,040 |
| Hilton Worldwide Hldgs Wi | 167,559 | 243,079 | - | 243,079 |
| Host Hotels Resorts Inc | 793,837 | 767,244 | 8,422 | 775,666 |
| Hunt J B Trans Svcs Inc | 299,950 | 262,438 | - | 262,438 |
| Hunt J B Trans Svcs Inc | 438,080 | 446,629 | - | 446,629 |
| Huntsman Corp | 1,000,762 | 760,572 | - | 760,572 |
| Icon Plc | 663,013 | 911,656 | - | 911,656 |
| Ihs Markit Ltd | 977,078 | 1,636,393 | - | 1,636,393 |
| Incyte Corp | 924,782 | 942,121 | - | 942,121 |
| Ingredion Inc | 736,446 | 614,715 | 4,658 | 619,373 |
| Invitation Homes Inc | 564,720 | 652,212 | - | 652,212 |
| Itron Inc | 344,500 | 369,914 | - | 369,914 |
| Itron Inc | 321,691 | 307,657 | - | 307,657 |
| J P Morgan Chase Co | 448,494 | 1,248,359 | - | 1,248,359 |
| Jack Henry Associates Inc | 591,007 | 569,830 | - | 569,830 |
| Jacobs Engr Group Inc | 965,960 | 1,112,935 | - | 1,112,935 |
| Jazz Pharmaceuticals Plc | 885,690 | 937,617 | - | 937,617 |
| Johnson Ctls Intl Plc | 1,622,541 | 1,578,249 | 10,579 | 1,588,828 |
| K B Home | 508,995 | 592,691 | - | 592,691 |
| Keysight Technologies Inc | 500,787 | 715,426 | - | 715,426 |
| Kilroy Rlty Corp | 442,118 | 428,762 | 2,817 | 431,580 |
| Kilroy Rlty Corp | 535,903 | 560,956 | 3,686 | 564,642 |
| Kinder Morgan Inc | 189,377 | 246,029 | - | 246,029 |
| Kinross Gold Corp | 579,314 | 546,300 | - | 546,300 |
| Kla Corporation | 890,907 | 945,718 | - | 945,718 |
| Knight Swift Transportation | 559,383 | 548,395 | - | 548,395 |
| Leidos Holdings Inc | 252,216 | 322,594 | - | 322,594 |
| Liberty Formula One Common Stock | 751,895 | 779,437 | - | 779,437 |
| Liberty Ppty Tr Sbi | 368,038 | 435,348 | 3,567 | 438,915 |
| Lincoln Elec Hldgs Inc | 577,306 | 520,015 | 2,969 | 522,984 |
| Louisiana Pac Corp | 611,420 | 643,780 | - | 643,780 |
| Lowes Co Inc | 1,346,703 | 1,734,643 | - | 1,734,643 |
| Macerich Co | 531,649 | 358,343 | - | 358,343 |
| Magellan Midstream Partners Lp | 1,393,897 | 1,477,952 | - | 1,477,952 |
| Marketaxess Hldgs Inc | 190,302 | 400,168 | - | 400,168 |
| Medtronic Plc | 1,247,858 | 1,552,689 | - | 1,552,689 |
| Mettler Toledo Intl Inc | 502,734 | 713,160 | - | 713,160 |
| Microchip Technology Inc | 251,008 | 249,523 | - | 249,523 |
| Microsoft Corp | 200,836 | 1,303,833 | - | 1,303,833 |
| Middleby Corp | 488,913 | 562,477 | - | 562,477 |
| Monolithic Power Systems Inc | 555,754 | 596,889 | 1,522 | 598,411 |
| Mplx Lp | 1,552,751 | 1,237,866 | - | 1,237,866 |
| Msci Inc | 163,344 | 485,460 | - | 485,460 |
| Mylan Nv | 896,873 | 490,185 | - | 490,185 |
| National Retail Properties Inc | 175,530 | 222,642 | - | 222,642 |
| New York Community Bancorp Inc | 519,709 | 477,683 | - | 477,683 |
| Newmont Mining Corp | 289,133 | 331,188 | - | 331,188 |
| Nexstar Broadcasting Group A | 111,250 | 183,517 | - | 183,517 |

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2019

| Asset Class / Security Type / Issuer | Cost | Market Value | Accrued Interest or | |
|--------------------------------------|-----------|--------------|---------------------|---------------|
| | | | Dividends | Mkt + Accrued |
| Nielsen Holdings Plc | 355,120 | 232,260 | - | 232,260 |
| Nielsen Holdings Plc | 1,327,352 | 859,817 | - | 859,817 |
| Noble Midstream Partners Lp | 143,726 | 153,295 | - | 153,295 |
| Northern Trust Corp | 1,346,713 | 1,343,700 | 6,530 | 1,350,230 |
| Norwegian Cruise Line Holdings Ltd | 1,151,092 | 1,215,041 | - | 1,215,041 |
| Nuance Communications Inc | 817,404 | 761,162 | - | 761,162 |
| Nustar Energy Lp | 89,745 | 88,694 | - | 88,694 |
| O Reilly Automotive Inc | 246,762 | 375,229 | - | 375,229 |
| On Semiconductor Corporation | 214,088 | 195,754 | - | 195,754 |
| Onemain Holdings Inc | 513,995 | 518,713 | - | 518,713 |
| Oneok Inc | 705,367 | 1,245,048 | - | 1,245,048 |
| Oracle Corporation | 1,151,856 | 1,604,161 | - | 1,604,161 |
| Pan American Silver Corp | 446,832 | 345,485 | - | 345,485 |
| Parsley Energy Inc Class A | 799,513 | 534,029 | - | 534,029 |
| Pbf Energy Inc Class A | 558,490 | 483,022 | - | 483,022 |
| Pebblebrook Hotel Trust | 338,321 | 293,072 | 3,952 | 297,024 |
| Penn National Gaming Inc | 564,008 | 410,199 | - | 410,199 |
| Penumbra Inc | 735,589 | 882,720 | - | 882,720 |
| Perspecta Inc | 286,961 | 293,655 | 663 | 294,318 |
| Philip Morris Intl | 641,556 | 1,051,752 | 15,268 | 1,067,020 |
| Phillips 66 | 1,138,104 | 1,497,669 | - | 1,497,669 |
| Phillips 66 Partners Lp | 686,810 | 693,466 | - | 693,466 |
| Physicians Realty Trust | 286,144 | 303,456 | - | 303,456 |
| Pjt Partners Inc | 297,925 | 293,243 | - | 293,243 |
| Plains All Amer Pipeline Lp | 2,848,588 | 1,859,926 | - | 1,859,926 |
| Ppl Corporation | 559,430 | 590,647 | 7,093 | 597,741 |
| Pra Health Sciences Inc | 446,309 | 469,674 | - | 469,674 |
| Prologis Inc | 839,151 | 1,261,575 | - | 1,261,575 |
| Public Storage Inc | 508,763 | 595,425 | - | 595,425 |
| Qts Realty Trust Inc Cl A | 338,759 | 378,676 | 3,608 | 382,284 |
| Qualcomm Inc | 1,299,682 | 1,520,639 | - | 1,520,639 |
| Quanta Svcs Inc | 208,336 | 217,912 | 190 | 218,102 |
| Rattler Midstream Partners L P | 85,270 | 91,521 | - | 91,521 |
| Realpage Inc | 361,046 | 351,335 | - | 351,335 |
| Realty Income Corp | 401,747 | 441,408 | 1,450 | 442,858 |
| Regency Centers Corporation | 403,067 | 416,658 | - | 416,658 |
| Roku Inc | 256,042 | 249,548 | - | 249,548 |
| Sage Therapeutics Inc | 351,155 | 811,272 | - | 811,272 |
| Sanofi A D R | 717,420 | 802,875 | - | 802,875 |
| Sba Communications Corp | 935,850 | 1,555,668 | - | 1,555,668 |
| Schlumberger Ltd | 1,456,491 | 847,297 | 10,661 | 857,957 |
| Scorpio Tankers Inc | 275,251 | 269,842 | - | 269,842 |
| Seattle Genetics Inc | 609,279 | 786,848 | - | 786,848 |
| Servicenow Inc | 56,271 | 180,392 | - | 180,392 |
| Shell Midstream Partners L P | 717,771 | 545,185 | - | 545,185 |
| Simon Property Group Inc | 1,112,372 | 1,144,680 | - | 1,144,680 |
| Sinclair Broadcast Group Inc A | 186,014 | 332,291 | - | 332,291 |
| Skechers U S A Inc | 1,019,156 | 1,071,542 | - | 1,071,542 |
| Skywest Inc | 745,895 | 916,906 | 1,814 | 918,719 |
| Sl Green Rlty Corp | 150,199 | 136,629 | 1,445 | 138,074 |
| Slm Corp | 46,846 | 60,225 | - | 60,225 |
| Splunk Inc | 458,392 | 677,793 | - | 677,793 |
| Ss C Technologies Holdings | 1,062,324 | 1,370,139 | - | 1,370,139 |
| Store Capital Corp | 496,525 | 627,291 | 6,237 | 633,528 |
| Sun Communities Inc | 575,336 | 922,968 | 5,400 | 928,368 |
| Sunstone Hotel Invs Inc | 107,412 | 104,196 | 380 | 104,576 |
| Svb Finl Group | 498,235 | 420,882 | - | 420,882 |

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2019

| Asset Class / Security Type / Issuer | Cost | Market Value | Accrued Interest or Dividends | Mkt + Accrued |
|---|----------------|----------------|----------------------------------|----------------|
| Take-Two Interactive Software Inc | 838,626 | 1,097,154 | - | 1,097,154 |
| Talend Sa A D R | 816,849 | 753,084 | - | 753,084 |
| Tallgrass Energy Gp Lp | 474,581 | 459,058 | - | 459,058 |
| Targa Resources Corp | 568,270 | 389,852 | - | 389,852 |
| Taylor Morrison Home Corp A | 387,796 | 422,742 | - | 422,742 |
| Teradyne Inc | 527,307 | 615,835 | - | 615,835 |
| Teradyne Inc | 367,968 | 450,641 | - | 450,641 |
| Texas Instruments Inc | 370,756 | 1,615,936 | - | 1,615,936 |
| The Gap Inc | 702,798 | 459,691 | - | 459,691 |
| Therapeutics Md Inc | 1,615,883 | 624,182 | - | 624,182 |
| Topbuild Corp | 243,252 | 311,674 | - | 311,674 |
| Total System Services Inc | 476,848 | 621,596 | 630 | 622,226 |
| Transunion | 505,915 | 1,037,300 | - | 1,037,300 |
| Trinet Group Inc | 83,089 | 288,760 | - | 288,760 |
| Tyler Technologies Inc | 705,697 | 708,546 | - | 708,546 |
| Udr Inc | 467,547 | 583,570 | - | 583,570 |
| Under Armour Inc Cl A | 761,662 | 1,058,920 | - | 1,058,920 |
| United Technologies Corp | 973,039 | 1,295,230 | - | 1,295,230 |
| Unitedhealth Group Inc | 735,109 | 736,178 | - | 736,178 |
| Universal Health Svcs B | 497,808 | 568,761 | - | 568,761 |
| Us Bancorp | 1,468,112 | 1,518,133 | 10,720 | 1,528,852 |
| Us Concrete Inc | 956,086 | 705,548 | - | 705,548 |
| Vail Resorts Inc | 779,872 | 971,949 | 7,665 | 979,614 |
| Valero Energy Corp | 765,398 | 815,521 | - | 815,521 |
| Ventas Inc | 578,329 | 639,824 | 7,419 | 647,243 |
| Vici Pptys Inc | 766,329 | 764,788 | 9,085 | 773,873 |
| Voya Financial Inc | 448,855 | 466,456 | - | 466,456 |
| Wabtec Corp | 757,680 | 744,295 | - | 744,295 |
| Wayfair Inc Class A | 217,916 | 430,700 | - | 430,700 |
| Weingarten Rlty Invt | 314,975 | 304,362 | - | 304,362 |
| Wellcare Health Plans Inc | 366,571 | 404,799 | - | 404,799 |
| Wells Fargo Co | 718,648 | 1,216,219 | - | 1,216,219 |
| Welltower Inc | 714,143 | 864,218 | - | 864,218 |
| Werner Enterprises Inc | 509,779 | 513,846 | - | 513,846 |
| Wesco Aircraft Holdings Inc | 345,645 | 328,205 | - | 328,205 |
| Western Midstream Partners L | 1,545,305 | 1,292,678 | - | 1,292,678 |
| Williams Cos Inc | 1,344,096 | 1,208,860 | - | 1,208,860 |
| Workday Inc | 199,596 | 401,703 | - | 401,703 |
| Zogenix Inc | 484,288 | 490,366 | - | 490,366 |
| Subtotal - Domestic Equity | \$ 169,393,355 | \$ 186,156,948 | \$ 232,815 | \$ 186,389,762 |
| Domestic Equity Commingled Accounts | | | | |
| BlackRock S&P | \$ 7,161,275 | \$ 11,175,555 | \$ - | \$ 11,175,555 |
| Dimensional Fund Advisors | 7,599,988 | 39,721,020 | - | 39,721,020 |
| SBI Domestic Index Stock | 145,379,565 | 250,955,475 | - | 250,955,475 |
| Subtotal - Domestic Equity Commingled | \$ 160,140,828 | \$ 301,852,050 | \$ - | \$ 301,852,050 |
| International Equity Commingled Accounts | | | | |
| JPMorgan Global Focus | \$ 124,072 | \$ 212,942 | \$ - | \$ 212,942 |
| SBI - International | 61,197,293 | 72,870,932 | - | 72,870,932 |
| Subtotal - International Equity Commingled | \$ 61,321,365 | \$ 73,083,874 | \$ - | \$ 73,083,874 |
| International Equity Mutual Funds | | | | |
| BlackRock iShares ETF | \$ 7,687,367 | \$ 6,763,383 | \$ - | \$ 6,763,383 |
| Morgan Stanley Ins Glb Fra I | 50,292,851 | 77,154,362 | - | 77,154,362 |
| Subtotal - Int'l Equity Mutual Fund | \$ 57,980,218 | \$ 83,917,745 | \$ - | \$ 83,917,745 |
| Fixed Income Commingled Accounts | | | | |
| Allianz Global Investors | \$ 26,000,000 | \$ 33,117,586 | | \$ 33,117,586 |
| Brandywine Global Opportunistic Fi | 32,626,112 | 37,351,252 | | 37,351,252 |
| Subtotal - Fixed Income Commingled | \$ 58,626,112 | \$ 70,468,838 | \$ - | \$ 70,468,838 |

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2019

| Asset Class / Security Type / Issuer | Cost | Market Value | Accrued Interest or Dividends | Mkt + Accrued |
|--------------------------------------|------------|--------------|----------------------------------|---------------|
| Fixed Income Securities | | | | |
| Aaset 2018 3 Ltd 4.460% 12/15/38 | \$ 937,635 | \$ 937,635 | \$ 1,858.60 | \$ 939,494 |
| Aaset_14-1-Ar 0.00001% 1/15/43 | 1,709,505 | 1,697,367 | - | 1,697,367 |
| Acis Clo Ltd 5.15829% 5/01/27 | 995,000 | 999,868 | 8,740 | 1,008,608 |
| Actavis Funding 3.85163% 3/12/20 | 206,594 | 206,308 | 417 | 206,725 |
| Aercap Ireland Cap 4.250% 7/01/20 | 151,686 | 152,207 | 3,188 | 155,394 |
| Alexandria Real 2.750% 1/15/20 | 209,431 | 210,088 | 2,663 | 212,751 |
| Ameren Corp 2.700% 11/15/20 | 109,779 | 110,359 | 380 | 110,738 |
| American Equity Int 5.000% 6/15/27 | 337,384 | 341,558 | 740 | 342,298 |
| American Tower Corp 2.800% 6/01/20 | 249,170 | 250,570 | 583 | 251,153 |
| Analog Devices Inc 2.950% 1/21/21 | 30,066 | 30,273 | 415 | 30,688 |
| Anchorage Credit 3.500% 2/15/35 | 1,000,000 | 971,274 | 13,222 | 984,496 |
| Anchorage Credit 16.21596% 7/28/30 | 1,000,000 | 992,199 | 7,525 | 999,724 |
| Angel Oak Mortgage 2.708% 11/25/47 | 383,302 | 383,260 | 865 | 384,125 |
| Anthem Inc 2.500% 11/21/20 | 100,089 | 100,199 | 278 | 100,477 |
| Anz New Zealand Mtn 2.850% 8/06/20 | 199,400 | 201,228 | 2,296 | 203,524 |
| Assurant Inc 3.94566% 3/26/21 | 250,000 | 250,018 | 137 | 250,155 |
| Axis Specialty 5.875% 6/01/20 | 206,240 | 206,194 | 979 | 207,173 |
| Barclays Bank Mtn 3.1498% 10/31/19 | 550,000 | 550,215 | 48 | 550,263 |
| Bcap Llc Trust 3.00436% 3/26/36 | 97,052 | 103,710 | 33 | 103,743 |
| Bear Stearns 5.156% 9/15/27 | 354,047 | 351,509 | 802 | 352,311 |
| Broadcom Crp Caymn 2.375% 1/15/20 | 198,448 | 199,652 | 2,190 | 201,842 |
| Ca Inc 5.375% 12/01/19 | 197,776 | 196,732 | 873 | 197,605 |
| Cal Funding Ltd 3.960% 2/25/43 | 866,397 | 893,109 | 572 | 893,681 |
| Capital Automotive 3.904% 10/15/44 | 597,651 | 603,229 | 1,037 | 604,266 |
| Capital One 2.500% 5/12/20 | 248,305 | 250,260 | 851 | 251,111 |
| Capital One 3.25943% 5/12/20 | 10,038 | 10,042 | 47 | 10,088 |
| Capmark Military 5.74606% 2/10/52 | 706,008 | 754,280 | 2,358 | 756,638 |
| Capmark Military 7.97602% 7/10/55 | 896,678 | 1,288,079 | 3,801 | 1,291,881 |
| Carlyle Global 3.3258% 4/27/27 | 1,003,623 | 997,989 | 6,071 | 1,004,060 |
| Cascade Funding 2.800% 6/25/69 | 499,880 | 500,000 | 117 | 500,117 |
| Catamaran Clo Ltd 5.61256% 10/18/26 | 750,000 | 750,202 | 8,834 | 759,036 |
| Cerberus Onshore 5.18371% 1/15/28 | 1,000,000 | 994,932 | 10,966 | 1,005,898 |
| Cfcre Commercial 1.19411% 1/10/48 | 462,772 | 328,248 | 5,800 | 334,049 |
| Chesterfield 4.500% 12/15/34 | 288,000 | 289,394 | 576 | 289,970 |
| Cit Mortgage Loan 3.5533% 10/25/37 | 1,086,971 | 1,103,628 | 700 | 1,104,328 |
| Citigroup Commerci 1.94111% 4/10/49 | 489,096 | 353,738 | 6,083 | 359,821 |
| City National Corp 5.250% 9/15/20 | 103,117 | 103,523 | 1,546 | 105,069 |
| Coca Cola Femsa 4.625% 2/15/20 | 202,886 | 202,450 | 3,494 | 205,944 |
| Comm Mortgage Trust 3.4244% 3/10/31 | 508,134 | 520,620 | 1,427 | 522,047 |
| Constellation Brands 2.250% 11/06/20 | 296,221 | 299,358 | 1,031 | 300,389 |
| Cred Suis Gp Fun Ltd 2.750% 3/26/20 | 249,115 | 250,390 | 1,814 | 252,204 |
| Credit Suisse 2.90438% 11/30/37 | 541,587 | 616,891 | 1,413 | 618,304 |
| Deutsche Telekom Int 2.225% 1/17/20 | 248,450 | 249,355 | 2,534 | 251,889 |
| Diamond Head 3.810% 7/14/28 | 254,779 | 255,578 | 459 | 256,037 |
| Discover Bank 3.100% 6/04/20 | 249,695 | 251,208 | 581 | 251,789 |
| Dryden Senior Loan 0.00001% 4/15/27 | 974,283 | 913,946 | 0 | 913,946 |
| Erp Operating Lp 4.750% 7/15/20 | 50,976 | 50,858 | 106 | 50,964 |
| Exelon Corp 2.850% 6/15/20 | 146,599 | 147,466 | 186 | 147,652 |
| F H L M C Mltcl 1.36764% 11/25/55 | 1,084,789 | 1,049,260 | 1,992 | 1,051,253 |
| F H L M C Mltcl Mt 2.16307% 6/25/57 | 829,263 | 851,518 | 1,500 | 853,018 |
| F H L M C Mltcl Mtg 3.000% 10/25/27 | 1,001,624 | 1,032,440 | 2,500 | 1,034,940 |
| F H L M C Mltcl Mtg 3.019% 6/25/27 | 875,458 | 875,322 | 2,138 | 877,460 |
| F H L M C Mltcl Mtg 3.450% 1/25/28 | 1,002,749 | 1,070,940 | 2,875 | 1,073,815 |
| F H L M C Mltcl Mtg 3.600% 2/25/28 | 1,011,469 | 1,080,160 | 3,000 | 1,083,160 |
| F H L M C Mltcl Mtg 3.920% 6/25/28 | 1,029,009 | 1,102,580 | 3,267 | 1,105,847 |
| F H L M C Mltcl Mtg 2.6174% 7/25/56 | 724,349 | 902,727 | 2,233 | 904,961 |
| F H L M C Strip 3/15/31 | 2,014,448 | 2,391,456 | - | 2,391,456 |
| F H L M C Strip 7/15/32 | 183,102 | 215,850 | - | 215,850 |

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2019

| Asset Class / Security Type / Issuer | | Cost | Market Value | Accrued Interest or Dividends | Mkt + Accrued |
|--------------------------------------|--------------------|-----------|--------------|----------------------------------|---------------|
| F N M A Strip | 1/15/30 | 391,557 | 461,832 | - | 461,832 |
| F N M A Strip | 5/15/30 | 305,270 | 341,532 | - | 341,532 |
| F N M A #An0285 | 1.950% 11/01/20 | 249,141 | 249,240 | 406 | 249,646 |
| F N M A #An3292 | 2.860% 9/01/29 | 553,094 | 565,593 | 1,311 | 566,903 |
| F N M A #An6349 | 2.990% 9/01/29 | 500,313 | 517,675 | 1,246 | 518,921 |
| F N M A #An7049 | 3.050% 10/01/29 | 505,625 | 520,290 | 1,271 | 521,561 |
| F N M A #An7843 | 3.180% 12/01/29 | 506,458 | 521,903 | 1,315 | 523,219 |
| F N M A #An8031 | 3.030% 2/01/30 | 1,000,625 | 1,038,060 | 2,525 | 1,040,585 |
| F N M A #An8173 | 3.230% 1/01/30 | 1,000,059 | 1,035,473 | 2,634 | 1,038,107 |
| F N M A #An8193 | 3.170% 1/01/30 | 1,377,449 | 1,475,950 | 3,698 | 1,479,648 |
| F N M A #An8194 | 3.220% 1/01/30 | 1,088,355 | 1,161,622 | 2,952 | 1,164,574 |
| F N M A #An8721 | 3.580% 4/01/33 | 978,593 | 1,048,623 | 2,933 | 1,051,556 |
| F N M A #BI2513 | 3.330% 5/01/34 | 1,006,914 | 1,051,840 | 2,775 | 1,054,615 |
| F N M A Gtd Remic | 2.980% 8/25/29 | 1,002,204 | 1,021,830 | 2,483 | 1,024,313 |
| F N M A Strip | 7/15/37 | 789,735 | 880,560 | - | 880,560 |
| Fdf Limited | 4.285% 5/12/31 | 999,000 | 1,002,122 | 5,594 | 1,007,716 |
| Fidelity National | 3.625% 10/15/20 | 201,708 | 202,954 | 1,531 | 204,485 |
| Florida Gas Trns | 5.450% 7/15/20 | 205,822 | 205,200 | 5,026 | 210,226 |
| Four Times Square Tr | 5.401% 12/13/28 | 974,747 | 974,506 | 3,103 | 977,609 |
| Ge Wmc Mortgage | 2.9504% 12/25/35 | 613,043 | 612,034 | 280 | 612,314 |
| Golub Capital | 3.86513% 2/05/31 | 650,000 | 640,219 | 3,978 | 644,197 |
| Gsaa Home Equity | 3.09761% 6/25/35 | 1,078,875 | 1,217,760 | 574 | 1,218,334 |
| Halfmoon Parent | 2.93241% 3/17/20 | 14,990 | 15,012 | 17 | 15,029 |
| Halfmoon Parent Inc | 3.200% 9/17/20 | 170,231 | 171,571 | 1,572 | 173,142 |
| Harris Corporation | 2.700% 4/27/20 | 199,022 | 200,206 | 960 | 201,166 |
| Humana Inc | 2.500% 12/15/20 | 24,975 | 25,013 | 28 | 25,041 |
| Ingersoll Rand | 2.625% 5/01/20 | 250,183 | 250,135 | 1,094 | 251,229 |
| Jefferies Group | 8.500% 7/15/19 | 204,798 | 200,422 | 7,839 | 208,261 |
| Juniper Networks Inc | 3.300% 6/15/20 | 200,438 | 201,176 | 293 | 201,469 |
| Kraft Heinz Foods Co | 2.800% 7/02/20 | 99,648 | 100,111 | 1,392 | 101,503 |
| Lancer Fin Spv Ltd | 7.850% 12/10/16 | 235,027 | 23 | 47,681 | 47,704 |
| Marriott | 3.375% 10/15/20 | 120,878 | 121,052 | 855 | 121,907 |
| Marriott | 3.29626% 12/01/20 | 40,184 | 40,153 | 110 | 40,263 |
| Molex Electronics | 2.878% 4/15/20 | 199,264 | 200,098 | 1,215 | 201,313 |
| Molson Coors | 2.250% 3/15/20 | 49,718 | 49,877 | 331 | 50,208 |
| Mondelez | 3.000% 5/07/20 | 269,992 | 271,094 | 1,215 | 272,309 |
| Morgan Stanley | 5.500% 7/24/20 | 232,484 | 232,254 | 5,397 | 237,651 |
| Mountain Hawk Clo | 3.44941% 7/20/24 | 699,107 | 698,226 | 5,007 | 703,233 |
| Mountain View Clo | 10.30347% 10/15/26 | 919,511 | 915,152 | 1,374 | 916,526 |
| N Star Real Estate | 2.58975% 2/01/41 | 207,026 | 213,937 | 506 | 214,443 |
| Newmont Mining Corp | 5.125% 10/01/19 | 202,250 | 201,184 | 2,563 | 203,747 |
| Newport Mesa Ca | | 234,342 | 270,006 | - | 270,006 |
| Nextera Energy | 3.05875% 9/28/20 | 240,000 | 239,765 | 61 | 239,826 |
| Oak Hill Credit | 4.76309% 10/20/25 | 950,356 | 875,100 | - | 875,100 |
| Oneok Partners Lp | 3.800% 3/15/20 | 201,364 | 201,378 | 2,238 | 203,616 |
| Quest Diagnostics | 2.500% 3/30/20 | 199,616 | 199,748 | 1,264 | 201,012 |
| Raspro Trust | 3.24175% 3/23/24 | 613,451 | 618,606 | 4,364 | 622,970 |
| Republic Services | 5.500% 9/15/19 | 241,493 | 241,339 | 3,887 | 245,226 |
| Reynolds American | 3.250% 6/12/20 | 270,093 | 271,833 | 463 | 272,296 |
| Rolls Royce Plc | 2.375% 10/14/20 | 249,643 | 249,613 | 1,270 | 250,882 |
| S P Global Inc | 3.300% 8/14/20 | 100,403 | 101,046 | 1,256 | 102,302 |
| Station Place | 0.00001% 9/24/19 | 300,000 | 300,000 | 174 | 300,174 |
| Station Place | 3.09224% 4/24/21 | 150,000 | 150,000 | 90 | 150,090 |
| Station Place | 3.15604% 7/24/21 | 500,000 | 500,000 | - | 500,000 |
| Station Place | 3.25724% 9/24/19 | 1,000,000 | 1,000,000 | 629 | 1,000,629 |
| Store Master Funding | 3.960% 10/20/46 | 950,926 | 975,244 | 1,151 | 976,395 |
| Store Master Funding | 4.170% 4/20/45 | 489,329 | 503,464 | 624 | 504,088 |
| Synchrony Bank | 3.12304% 3/30/20 | 350,728 | 350,301 | 3,011 | 353,312 |
| Sysco Corporation | 2.600% 10/01/20 | 9,939 | 10,034 | 65 | 10,099 |
| T V A | 5.375% 4/01/56 | 399,188 | 485,255 | 4,434 | 489,689 |

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2019

| Asset Class / Security Type / Issuer | Cost | Market Value | Accrued Interest or Dividends | Mkt + Accrued |
|--|-----------------------|-------------------------|----------------------------------|-------------------------|
| Taco Bell Funding 4.970% 5/25/46 | 621,130 | 633,755 | 2,993 | 636,748 |
| Telefonica Emis 5.134% 4/27/20 | 20,442 | 20,409 | 183 | 20,591 |
| Textainer Marine 3.720% 5/20/42 | 803,963 | 815,133 | 914 | 816,047 |
| The Bancorp 3.69417% 1/15/33 | 1,000,000 | 999,840 | 1,620 | 1,001,460 |
| Towd Point 3.000% 1/25/58 | 289,314 | 292,552 | 724 | 293,276 |
| Towd Point Mortgage 2.750% 10/25/57 | 547,153 | 564,588 | 1,284 | 565,872 |
| Treman Park Clo 7.74053% 4/20/27 | 472,755 | 435,619 | - | 435,619 |
| Turbine Engine 5.125% 12/13/48 | 399,896 | 394,014 | 915 | 394,929 |
| Tva 4.250% 9/15/65 | 507,115 | 629,595 | 6,257 | 635,852 |
| U S Treasury Bd 2.875% 5/15/49 | 2,215,807 | 2,238,954 | 7,663 | 2,246,618 |
| U S Treasury I P S 0.125% 1/15/22 | 2,485,244 | 2,491,117 | 1,446 | 2,492,563 |
| U S Treasury I P S 0.125% 7/15/24 | 1,547,220 | 1,554,547 | 891 | 1,555,437 |
| U S Treasury I P S 1.000% 2/15/48 | 357,134 | 392,377 | 1,390 | 393,767 |
| U S Treasury I P S 1.375% 1/15/20 | 1,942,356 | 1,934,661 | 12,299 | 1,946,960 |
| U S Treasury I P S 1.375% 2/15/44 | 787,354 | 801,188 | 3,647 | 804,835 |
| U S Treasury I P S 2.125% 2/15/40 | 404,630 | 438,618 | 2,737 | 441,355 |
| U S Treasury I P S 2.375% 1/15/27 | 2,607,550 | 2,670,661 | 25,334 | 2,695,994 |
| U S Treasury I P S 3.875% 4/15/29 | 665,274 | 657,358 | 4,004 | 661,362 |
| U S Treasury Nt 2.375% 2/29/24 | 4,169,930 | 4,258,742 | 32,881 | 4,291,622 |
| U S Treasury Nt 2.375% 3/15/22 | 7,097,316 | 7,192,253 | 49,254 | 7,241,506 |
| U S Treasury Nt 2.875% 11/30/23 | 2,916,881 | 2,955,050 | 6,867 | 2,961,917 |
| Ubs Ag London 3.1745% 6/08/20 | 230,761 | 230,892 | 466 | 231,359 |
| Ventas Realty Lp Cap 2.700% 4/01/20 | - | - | 1,350 | 1,350 |
| Venture Cdo Ltd 3.39078% 2/28/26 | 960,918 | 957,851 | 19,278 | 977,129 |
| Vmc Finance Llc 3.145% 4/15/35 | 496,690 | 493,421 | 710 | 494,131 |
| Vulcan Materials 3.21088% 6/15/20 | 29,967 | 30,003 | 43 | 30,046 |
| Wells Fargo 2.632% 5/15/48 | 299,074 | 299,619 | 658 | 300,277 |
| Wells Fargo 1.67153% 1/15/59 | 670,302 | 441,214 | 9,302 | 450,516 |
| Wells Fargo Coml 1.14499% 12/17/49 | 356,277 | 253,291 | 2,514 | 255,805 |
| Willis Engine Secur 5.500% 9/15/37 | 290,167 | 300,587 | 711 | 301,298 |
| Wind River Clo Ltd 0.00001% 1/15/26 | 1,000,000 | 1,000,000 | - | 1,000,000 |
| Yamana Gold Inc 4.950% 7/15/24 | 339,739 | 372,023 | 8,057 | 380,080 |
| Zimmer Holdings Inc 2.700% 4/01/20 | 239,483 | 240,300 | 1,620 | 241,920 |
| Subtotal - Fixed Income | \$ 96,501,145 | \$ 98,379,917 | \$ 488,215 | \$ 98,868,133 |
| Real Estate Commingled Fund | | | | |
| UBS Trumbull Property Fund | \$ 23,101,190 | \$ 36,673,517 | \$ - | \$ 36,673,517 |
| UBS Growth & Income Fund | 10,166,836 | 18,477,742 | - | 18,477,742 |
| Dune Real Estate Partners | 3,173,792 | 5,371,903 | - | 5,371,903 |
| Subtotal - Real Estate Commingled | \$ 36,441,818 | \$ 60,523,162 | \$ - | # \$ 60,523,162 |
| Private Equity | | | | |
| Edgewave | \$ 11,115 | \$ 11,115 | \$ - | \$ 11,115 |
| Franklin Park Private Equity Fund | 44,692,878 | 55,007,522 | - | 55,007,522 |
| North Sky - PEP IV Fund | 4,080,051 | 5,015,626 | - | 5,015,626 |
| RWI Group - Ventures I Capital Ltd Ptnr | 225,613 | 226,333 | - | 226,333 |
| VIA Fund III | 2,264,770 | 2,732,830 | - | 2,732,830 |
| Subtotal - Private Equity | \$ 51,274,427 | \$ 62,993,426 | \$ - | \$ 62,993,426 |
| Private Equity / Alternative | | | | |
| TCW | \$ 5,684,217 | \$ 6,153,448 | \$ - | \$ 6,153,448 |
| Parametric Def Eq Fund | 24,000,000 | 30,635,524 | - | 30,635,524 |
| Subtotal - Private Equity / Alternative | \$ 29,684,217 | \$ 36,788,972 | \$ - | \$ 36,788,972 |
| Opportunistic | | | | |
| Entrust | \$ 14,413,577 | \$ 16,801,538 | \$ - | \$ 16,801,538 |
| Subtotal - Opportunistic | \$ 14,413,577 | \$ 16,801,538 | \$ - | \$ 16,801,538 |
| TOTAL FUND | \$ 817,890,541 | \$ 1,073,093,227 | \$ 721,030 | \$ 1,073,814,257 |

ACTUARIAL SECTION

November 21, 2019

Ms. Jill E. Schurtz, Executive Director
St. Paul Teachers' Retirement Fund Association
1619 Dayton Avenue, Room 309
St. Paul, MN 55104-6206

Dear Ms. Schurtz:

We are pleased to present the report of the actuarial valuation of the St. Paul Teachers' Retirement Fund Association ("Fund") as of July 1, 2019. This report provides, among other things, the required annual contribution rate of the Fund for the Plan Year commencing July 1, 2019 and ending on June 30, 2020, according to prescribed assumptions.

The valuation was based upon data and information through June 30, 2019 furnished by the Fund staff, concerning Retirement Fund benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. Their efforts in furnishing the materials needed are gratefully acknowledged. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the Fund.

The report has been prepared at the request of the Fund's Board of Trustees in accordance with Section 356.215 of the Minnesota Statutes as well as the Standards for Actuarial Work established by the State of Minnesota Legislative Commission on Pensions and Retirement. To the best of our knowledge, this report is complete and accurate, and has been prepared in accordance with prescribed assumptions and generally accepted actuarial principles and practices. This report is intended for use by the Fund and those determined or approved by the Fund's Board of Trustees. This report may be provided to parties other than the Fund only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section 4 of this report. This report includes risk metrics on page 10, but does not include a robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements.

This report should not be relied on for any purpose other than the purpose described in this report. Determinations of financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Board of Trustees. These parties are responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in the Actuarial Basis of this report. The Fund is solely responsible for communicating to GRS any changes required thereto.

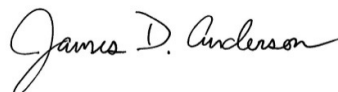
This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. Bonita J. Wurst, James D. Anderson and Sheryl L. Christensen are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

We will be pleased to review this report with you at your convenience.

Respectfully submitted,



Bonita J. Wurst, ASA, EA, FCA, MAAA



James D. Anderson, FSA, EA, FCA, MAAA



Sheryl L. Christensen, ASA, EA, FCA, MAAA

Summary of Valuation Results

(Dollars in Thousands)

| | July 1, 2018 | July 1, 2019 |
|--|------------------|------------------|
| | <u>Valuation</u> | <u>Valuation</u> |
| A. CONTRIBUTIONS % OF PAYROLL (Table 11) | | |
| 1. Statutory Contributions - Chapter 354A | 24.23% | 25.09% |
| 2. Required Contributions - Chapter 356 | <u>21.54%</u> | <u>21.87%</u> |
| 3. Sufficiency / (Deficiency) | 2.69% | 3.22% |
| B. FUNDING RATIOS | | |
| 1. Accrued Liability Funding Ratio | | |
| a. Current Assets (Table 1) | \$ 1,067,675 | \$ 1,079,552 |
| b. Actuarial Accrued Liability (Table 9) | <u>1,676,193</u> | <u>1,691,721</u> |
| c. Funding Ratio | 63.70% | 63.81% |
| 2. Projected Benefit Funding Ratio (Table 8) | | |
| a. Current and Expected Future Assets | \$ 2,004,176 | \$ 2,007,715 |
| b. Current and Expected Future Benefit Obligations | <u>1,869,580</u> | <u>1,884,116</u> |
| c. Funding Ratio | 107.20% | 106.56% |
| C. PLAN PARTICIPANTS | | |
| 1. Active Members | | |
| a. Number (Table 3) | 3,445 | 3,347 |
| b. Projected Annual Earnings | \$ 281,782 | \$ 280,595 |
| c. Average Annual Earnings (Projected dollars) | \$ 77,704 | \$ 79,893 |
| d. Average Age | 44.8 | 44.9 |
| e. Average Service | 12.7 | 13.1 |
| f. Members on Leave of Absence | 132 | 120 |
| 2. Others | | |
| a. Service Retirements (Table 4) | 3,547 | 3,632 |
| b. Disability Retirements (Table 5) | 25 | 25 |
| c. Survivors (Table 6) | 342 | 347 |
| d. Deferred Retirements (Table 7) | 2,031 | 2,489 |
| e. Terminated Other Non-Vested (Table 7) | <u>3,014</u> | <u>2,742</u> |
| f. Total - Others | 8,959 | 9,235 |
| 3. Grand Total (1.a + 1.f + 2.f) | 12,536 | 12,702 |

Accounting Balance Sheet

as of June 30, 2019

(Dollars in Thousands)

| | <u>Market Value</u> | |
|---|-------------------------|--|
| A. ASSETS | | |
| 1. Cash, Equivalents, Short-Term Securities | \$ 6,460 | |
| 2. Investments | | |
| a. Fixed Income | 177,333 | |
| b. Equity | 627,520 | |
| c. Real Assets | 69,529 | |
| d. Alternative | 115,852 | |
| e. Cash and Cash Equivalents | 82,859 | |
| 3. Other Assets | <u>3,594</u> | |
| B. TOTAL ASSETS | <u>\$ 1,083,147</u> | |
| C. AMOUNTS CURRENTLY PAYABLE | \$ 2,603 | |
| D. ASSETS AVAILABLE FOR BENEFITS | | |
| 1. Member Reserves | \$ 210,364 | |
| 2. Employer Reserves | <u>870,180</u> | |
| 3. Total Assets Available for Benefits | <u>\$ 1,080,544</u> | |
| E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS | <u>\$ 1,083,147</u> | |
| F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS | | |
| 1. Market Value of Assets Available for Benefits (D.3) | \$ 1,080,544 | |
| 2. Unrecognized Asset Returns | | |
| a. June 30, 2019 | \$ (18,200) | |
| b. June 30, 2018 | 15,610 | |
| c. June 30, 2017 | 54,191 | |
| d. June 30, 2016 | (77,451) | |
| 3. UAR Adjustment: $.80 * 2(a) + .60 * 2(b) + .40 * 2(c) + .20 * 2(d)$ | <u>992</u> | |
| 4. Actuarial Value of Assets: (F.1 - F.3) | <u>\$ 1,079,552</u> | |

| DERIVATION OF OTHER ASSETS * | <u>Market Value</u> |
|---------------------------------|---------------------|
| Accounts Receivable | |
| Employer Contribution | \$ 559 |
| Employee Contribution | 291 |
| Service Purchases Receivable | 196 |
| Pensions Receivable | 35 |
| State Contributions | 838 |
| Real Estate Income Receivable | 111 |
| Commission Recapture Receivable | 1 |
| Interest Receivable | 168 |
| Dividend Receivable | 571 |
| Misc. Receivable | - |
| Escrow Funds Receivable | - |
| Sale of Securities | <u>807</u> |
| Total Accounts Receivable | \$ 3,577 |
| Fixed Assets | <u>17</u> |
| Total Other Assets | <u>\$ 3,594</u> |

**Numbers may not add due to rounding.*

Change(s) in Assets Available for Benefits as of June 30, 2019 (Dollars in Thousands)

| | <u>Market Value</u> |
|--|---------------------|
| A. ASSETS AVAILABLE AT BEGINNING OF PERIOD | \$ 1,070,572 |
| B. OPERATING REVENUES | |
| 1. Member Contributions | \$ 20,626 |
| 2. Employer Contributions | 30,919 |
| 3. Supplemental Contributions | 15,665 |
| 4. Reemployed Annuitant Employer Contributions | 397 |
| 5. Investment Income | 14,167 |
| 6. Investment Expenses | (4,876) |
| 7. Net Realized Gain / (Loss) | 52,527 |
| 8. Other | 0 |
| 9. Net Change in Unrealized Gain / (Loss) | (1,609) |
| 10. Total Operating Revenue | \$ 127,816 |
| C. OPERATING EXPENSES | |
| 1. Service Retirements | \$ 104,517 |
| 2. Disability Benefits | 431 |
| 3. Survivor Benefits | 11,431 |
| 4. Refunds | 701 |
| 5. Administrative Expenses | 764 |
| 6. Total Operating Expenses | \$ 117,844 |
| D. OTHER CHANGES IN RESERVES | \$ 0 |
| E. ASSETS AVAILABLE AT END OF PERIOD | <u>\$ 1,080,544</u> |
| F. DETERMINATION OF CURRENT YEAR UNRECOGNIZED ASSET RETURN | |
| 1. Average Balance | |
| (a) Assets available at BOY | \$ 1,070,572 |
| (b) Assets available at EOY | 1,080,544 |
| (c) Average balance $\{[(a) + (b) - \text{Net Investment Income}] / 2\}$ {Net investment income: B.5+B.6+B.7+B.9} | \$ 1,045,454 |
| 2. Expected Return: $.075 * F.1$ | 78,409 |
| 3. Actual Return | 60,209 |
| 4. Current Year Gross Asset Gain/(Loss): F.3 - F.2 | \$ (18,200) |

Actuarial Balance Sheet as of July 1, 2019 (Dollars in Thousands)

| | |
|---|---------------------|
| A. CURRENT ASSETS (TABLE 1; Line F.4) | \$ 1,079,552 |
| B. EXPECTED FUTURE ASSETS | |
| 1. Present Value of Expected Future Statutory Supplemental Contributions* | \$ 735,768 |
| 2. Present Value of Future Normal Costs | 192,395 |
| 3. Total Expected Future Assets | <u>\$ 928,163</u> |
| C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS | <u>\$ 2,007,715</u> |
| D. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS | <u>\$ 1,884,116</u> |
| E. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (D - C) | \$ (123,599) |

* Includes the effect of scheduled employee and employer contribution increases and supplemental state contributions.

Determination of Unfunded Actuarial Accrued Liability (UAAL) and Supplemental Contribution Rate as of July 1, 2019 (Dollars in Thousands)

| | Actuarial Present Value of Projected Benefits | Actuarial Present Value of Future Normal Costs | Actuarial Accrued Liability |
|---|--|---|-----------------------------------|
| A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL) | | | |
| 1. Active Members * | | | |
| a. Retirement Benefits | \$ 593,230 | \$ 122,381 | \$ 470,849 |
| b. Disability Benefits | \$ 14,612 | \$ 4,556 | \$ 10,056 |
| c. Surviving Spouse and Child Benefits | \$ 6,214 | \$ 1,714 | \$ 4,500 |
| d. Vested Withdrawals | \$ 41,969 | \$ 47,597 | \$ (5,628) |
| e. Refund Liability Due to Death or Withdrawal | \$ 2,283 | \$ 16,147 | \$ (13,864) |
| f. Total | <u>\$ 658,308</u> | <u>\$ 192,395</u> | <u>\$ 465,913</u> |
| 2. Deferred Retirements | \$ 90,327 | \$ 0 | \$ 90,327 |
| 3. Former Members without Vested Rights | \$ 2,112 | \$ 0 | \$ 2,112 |
| 4. Annuitants | <u>\$ 1,133,369</u> | <u>\$ 0</u> | <u>\$ 1,133,369</u> |
| 5. Total | <u><u>\$ 1,884,116</u></u> | <u><u>\$ 192,395</u></u> | <u><u>\$ 1,691,721</u></u> |
| B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) | | | |
| 1. Actuarial Accrued Liability (A.5) | | | \$ 1,691,721 |
| 2. Current Assets (Table 1; Line F.4) | | | <u>\$ 1,079,552</u> |
| 3. Unfunded Actuarial Accrued Liability (B.1 - B.2) | | | <u><u>\$ 612,169</u></u> |
| C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE** | | | |
| 1. Present Value of Future Payrolls Through the Amortization Date of June 30, 2048*** | | | \$ 4,582,500 |
| 2. Supplemental Contribution Rate (B.3 / C.1) | | | 13.36% |

* Includes members on leave of absence.

** The amortization of the unfunded actuarial accrued liability (UAAL) using the current amortization method results in initial payments less than the "interest only" payment on the UAAL. Payments less than the interest only amount will result in the UAAL increasing for an initial period of time.

***Calculated using 7.5% annual investment return rate.

Changes in Unfunded Actuarial Accrued Liability (UAAL) as of July 1, 2019 (Dollars in Thousands)

| | |
|---|--------------------------|
| A. UAAL AT BEGINNING OF YEAR | \$ 608,518 |
| B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING | |
| 1. Normal Cost and Expenses | \$ 24,043 |
| 2. Contributions | \$ (67,607) |
| 3. Interest | \$ 44,005 |
| 4. Total | <u>\$ 441</u> |
| C. EXPECTED UAAL AT END OF YEAR (A + B.4) | \$ 608,959 |
| D. INCREASE / (DECREASE) DUE TO ACTUARIAL LOSSES / (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED | |
| 1. Age and Service Retirements | \$ 4,347 |
| 2. Disability Retirements | (137) |
| 3. Death-in-Service Benefits | 139 |
| 4. Withdrawals | (7,365) |
| 5. Salary Increases | (8,185) |
| 6. Investment Income | 16,870 |
| 7. Mortality of Annuitants | (4,423) |
| 8. Other Items | 5,001 |
| 9. Total | <u>\$ 6,247</u> |
| E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C + D.9) | \$ 615,206 |
| F. CHANGE IN UAAL DUE TO PLAN AMENDMENTS | - |
| G. CHANGE IN UAAL DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS | (3,037) |
| H. UAAL AT END OF YEAR (E + F + G) | <u><u>\$ 612,169</u></u> |

Determination of Contribution Sufficiency as of July 1, 2019 (Dollars in Thousands)

| | Percent-of- Payroll | Dollar Amount |
|--|------------------------|---------------|
| A. STATUTORY CONTRIBUTIONS - CHAPTER 354A | | |
| 1. Employee Contributions | 7.50% | \$ 21,045 |
| 2. Employer Contributions | | |
| a. Regular | 8.17% | 22,925 |
| b. Additional | 3.84% | 10,775 |
| 3. Supplemental Contribution | | |
| a. 1996 Legislation | 0.30% | 838 |
| b. 1997 Legislation | 1.01% | 2,827 |
| c. 2014 Legislation | 2.49% | 7,000 |
| d. 2018 Legislation | 1.78% | 5,000 |
| 4. Total | 25.09% | \$ 70,410 |
| B. REQUIRED CONTRIBUTIONS - CHAPTER 356 | | |
| 1. Normal Cost | | |
| a. Retirement Benefits | 5.42% | \$ 15,208 |
| b. Disability Benefits | 0.19% | 533 |
| c. Surviving Spouse and Child Benefits | 0.07% | 196 |
| d. Vested Withdrawals | 1.90% | 5,331 |
| e. Refund Liability Due to Death or Withdrawal | 0.66% | 1,852 |
| f. Total | 8.24% | \$ 23,120 |
| 2. Supplemental Contribution Amortization | 13.36% | 37,487 |
| 3. Allowance for Administrative Expenses | 0.27% | 758 |
| 4. Total | 21.87% | \$ 61,365 |
| C. CONTRIBUTION SUFFICIENCY / (DEFICIENCY) (A.4 - B.4) | 3.22% | 9,045 |
| Projected Annual Payroll for Fiscal Year Beginning on the Valuation Date (determined according to requirements of the LCPR Standards for Actuarial Work): | | \$ 280,595 |

Actuarial Methods and Assumptions as of July 1, 2019

I. ACTUARIAL COST METHOD

An Actuarial Cost Method is a set of techniques used by the actuary to develop contribution levels under a retirement plan. The Actuarial Cost Method used in this valuation for all purposes is the Entry Age Actuarial Cost Method. Under this Method, a Normal Cost is developed by amortizing the actuarial value of benefits expected to be received by each active participant (as a level percentage of pay) over the total working lifetime of that participant, from hire to termination. Years of Service for valuation purposes was provided by the Retirement Fund. Age as of the valuation date was calculated based on the dates of birth provided by the Retirement Fund. Entry Age for valuation purposes was calculated as the age on the valuation date minus the years of service on the valuation date.

To the extent that current assets and future Normal Costs do not support participants' expected future benefits, an Unfunded Actuarial Accrued liability ("UAAL") develops. The UAAL is amortized over the closed statutory amortization period ending June 30, 2048 using level percent-of-payroll assuming payroll increases of 3.00% per annum. The total contribution developed under this method is the sum of the Normal Cost and the payment toward the UAAL.

II. CURRENT ACTUARIAL ASSUMPTIONS

Assumptions are based on an experience study for the five-year period of July 1, 2011 to June 30, 2016, as well as a legislated change to the investment return assumption effective July 1, 2018. Note that the significant plan changes effective July 1, 2018 may ultimately result in behavior changes not anticipated in the actuarial assumptions.

A. *Demographic Assumptions*

Mortality:

1. Healthy and Disabled Annuitant Mortality:

- a. Male: RP-2014 Healthy Annuitant Mortality Table for males adjusted for white collar and projected with Scale MP-2018 from 2006
- b. Female: RP-2014 Healthy Annuitant Mortality Table for females adjusted for white collar and projected with Scale MP-2018 from 2006, set back 2 years

2. Employee Mortality:

- a. Male: RP-2014 Employee Mortality Table for males adjusted for white collar and projected with Scale MP-2018 from 2006
- b. Female: RP-2014 Employee Mortality Table for females adjusted for white collar and projected with Scale MP-2018 from 2006

Actuarial Methods and Assumptions as of July 1, 2019

Deaths Expressed as the Number of Occurrences per 10,000:

| <u>Age in 2019</u> | <u>Post-Retirement Mortality</u> | |
|------------------------|--------------------------------------|---------------|
| | <u>Male</u> | <u>Female</u> |
| 55 | 40 | 26 |
| 56 | 42 | 27 |
| 57 | 45 | 29 |
| 58 | 48 | 31 |
| 59 | 52 | 34 |
| 60 | 56 | 36 |
| 61 | 60 | 39 |
| 62 | 65 | 42 |
| 63 | 70 | 47 |
| 64 | 75 | 52 |
| 65 | 82 | 57 |
| 66 | 89 | 62 |
| 67 | 97 | 68 |
| 68 | 106 | 74 |
| 69 | 117 | 81 |
| 70 | 129 | 89 |
| 71 | 143 | 98 |
| 72 | 159 | 108 |
| 73 | 177 | 119 |
| 74 | 197 | 132 |
| 75 | 220 | 147 |
| 76 | 245 | 164 |
| 77 | 274 | 183 |
| 78 | 308 | 204 |
| 79 | 345 | 229 |
| 80 | 388 | 257 |
| 81 | 438 | 288 |
| 82 | 495 | 324 |
| 83 | 560 | 366 |
| 84 | 634 | 412 |

Actuarial Methods and Assumptions as of July 1, 2019

Deaths Expressed as the Number of Occurrences per 10,000:

| Age in <u>2019</u> | Pre-Retirement Mortality | |
|-------------------------------|-------------------------------------|----------------------|
| | <u>Male</u> | <u>Female</u> |
| 30 | 4 | 2 |
| 31 | 4 | 2 |
| 32 | 4 | 3 |
| 33 | 5 | 3 |
| 34 | 5 | 3 |
| 35 | 5 | 3 |
| 36 | 5 | 3 |
| 37 | 5 | 3 |
| 38 | 5 | 4 |
| 39 | 5 | 4 |
| 40 | 5 | 4 |
| 41 | 6 | 4 |
| 42 | 6 | 5 |
| 43 | 6 | 5 |
| 44 | 7 | 5 |
| 45 | 7 | 6 |
| 46 | 8 | 6 |
| 47 | 9 | 7 |
| 48 | 10 | 8 |
| 49 | 11 | 8 |
| 50 | 12 | 9 |
| 51 | 13 | 10 |
| 52 | 15 | 11 |
| 53 | 16 | 12 |
| 54 | 18 | 14 |
| 55 | 20 | 15 |
| 56 | 22 | 17 |
| 57 | 25 | 18 |
| 58 | 28 | 20 |
| 59 | 31 | 22 |

Actuarial Methods and Assumptions as of July 1, 2019

Rates of Disability:

Disability Expressed as the Number of Occurrences per 10,000:

| <u>Age</u> | <u>Disability</u> | <u>Age</u> | <u>Disability</u> |
|------------|-------------------|------------|-------------------|
| 20 | 1 | 45 | 4 |
| 21 | 1 | 46 | 4 |
| 22 | 1 | 47 | 4 |
| 23 | 1 | 48 | 4 |
| 24 | 1 | 49 | 4 |
| 25 | 1 | 50 | 9 |
| 26 | 1 | 51 | 9 |
| 27 | 1 | 52 | 9 |
| 28 | 1 | 53 | 9 |
| 29 | 1 | 54 | 9 |
| 30 | 2 | 55 | 17 |
| 31 | 2 | 56 | 17 |
| 32 | 2 | 57 | 17 |
| 33 | 2 | 58 | 17 |
| 34 | 2 | 59 | 17 |
| 35 | 2 | 60 | 35 |
| 36 | 2 | 61 | 35 |
| 37 | 2 | 62 | 35 |
| 38 | 2 | 63 | 35 |
| 39 | 2 | 64 | 35 |
| 40 | 3 | | |
| 41 | 3 | | |
| 42 | 3 | | |
| 43 | 3 | | |
| 44 | 3 | | |

Actuarial Methods and Assumptions as of July 1, 2019

Rates of Termination:

| Year | Number of Terminations per 1,000 Active Members | |
|-----------|--|--------|
| | Male | Female |
| 1 | 400 | 400 |
| 2 | 260 | 220 |
| 3 | 160 | 150 |
| 4 | 110 | 120 |
| 5 | 80 | 100 |
| 6 | 50 | 85 |
| 7 | 48 | 70 |
| 8 | 45 | 55 |
| 9 | 43 | 45 |
| 10 | 40 | 40 |
| 11 | 38 | 38 |
| 12 | 35 | 35 |
| 13 | 33 | 30 |
| 14 | 30 | 25 |
| 15 & Over | 25 | 20 |

Rates of Retirement:

Retirements Expressed as the Number of Occurrences per 10,000:

| Age | Basic Members Eligible for Rule of 90 Provision | Basic Members Not Eligible for Rule of 90 Provision | Male Coordinated Members Eligible for Rule of 90 Provision | Female Coordinated Members Eligible for Rule of 90 Provision | Male Coordinated Members Not Eligible for Rule of 90 Provision | Female Coordinated Members Not Eligible for Rule of 90 Provision |
|-----------|---|--|---|---|---|---|
| 55 | 5,000 | 800 | 2,500 | 2,500 | 900 | 500 |
| 56 | 5,000 | 1,300 | 2,500 | 2,500 | 700 | 500 |
| 57 | 4,000 | 1,300 | 2,500 | 2,500 | 700 | 500 |
| 58 | 4,000 | 1,800 | 2,500 | 2,500 | 700 | 600 |
| 59 | 3,500 | 1,800 | 2,500 | 3,000 | 700 | 600 |
| 60 | 3,500 | 2,000 | 2,500 | 3,000 | 1,200 | 900 |
| 61 | 3,500 | 2,000 | 2,500 | 3,000 | 1,200 | 1,100 |
| 62 | 3,500 | 4,000 | 4,500 | 3,000 | 2,500 | 2,000 |
| 63 | 3,500 | 4,000 | 3,500 | 3,000 | 2,800 | 2,300 |
| 64 | 4,000 | 4,000 | 2,500 | 3,000 | 2,800 | 2,600 |
| 65 | 5,000 | 5,000 | 3,000 | 4,500 | 3,000* | 4,500* |
| 66 | 3,000 | 5,000 | 3,000 | 4,300 | 3,000 | 4,300 |
| 67 | 3,000 | 5,000 | 3,500 | 3,800 | 3,500 | 3,800 |
| 68 | 3,000 | 5,000 | 4,000 | 3,800 | 4,000 | 3,800 |
| 69 | 3,000 | 5,000 | 4,500 | 3,000 | 4,500 | 3,000 |
| 70 & Over | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |

**2,800 for male members and 3,000 for female members hired after June 30, 1989 with a Normal Retirement Age equal to 66.*

Actuarial Methods and Assumptions as of July 1, 2019

B. Economic Assumptions

| | |
|--------------------------|----------------------------------|
| Investment Return Rate: | 7.50% |
| Price Inflation: | 2.50% per year |
| Wage Inflation: | 3.00% per year |
| Future Salary Increases: | Service-based rates shown below: |

Annual Salary Increases

| Year | Ultimate Rate of Annual Salary Increases | Year | Ultimate Rate of Annual Salary Increases |
|------|--|-----------|--|
| 1 | 9.00% | 21 | 3.40% |
| 2 | 8.00 | 22 | 3.20 |
| 3 | 7.00 | 23 & Over | 3.00 |
| 4 | 6.80 | | |
| 5 | 6.60 | | |
| 6 | 6.40 | | |
| 7 | 6.20 | | |
| 8 | 6.00 | | |
| 9 | 5.75 | | |
| 10 | 5.50 | | |
| 11 | 5.25 | | |
| 12 | 5.00 | | |
| 13 | 4.75 | | |
| 14 | 4.50 | | |
| 15 | 4.25 | | |
| 16 | 4.00 | | |
| 17 | 3.90 | | |
| 18 | 3.80 | | |
| 19 | 3.70 | | |
| 20 | 3.60 | | |

| | |
|--------------|--|
| Asset Value: | The actuarial value of assets is smoothed by using a five-year average market value. |
|--------------|--|

C. Other Assumptions

| | |
|-----------------|--|
| Marital Status: | It is assumed that 75% of male members and 60% of female members have an eligible spouse. The male spouse is assumed to be two years older than the female spouse. Married members are assumed to have two dependent children. |
|-----------------|--|

Actuarial Methods and Assumptions as of July 1, 2019

| | |
|---|---|
| Deferred Benefit Commencement: | Basic Plan members who terminate vested are assumed to commence benefits at age 61. Coordinated Plan members are assumed to commence benefits at age 62. If the member is already past the assumed deferral age, the member is assumed to commence benefits one year from the valuation date. |
| Administrative Expenses: | Prior year administrative expenses (excluding investment expenses) are expressed as a percentage-of-payroll and then applied to current projected payroll. |
| Refund of Contributions: | All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit. Account balances for deferred members accumulate interest until the assumed benefit commencement date and are discounted back to the valuation date. |
| Allowance for Combined Service Annuity: | 20.0% load on liabilities for former, vested members. 9.0% load on liabilities for former, non-vested members. |
| Missing Salary and Salary Minimums: | Active members with reported salaries of \$100 or less were assumed to have the average non-zero active salary. Active members with salaries less than those reported at the prior valuation date are valued using their prior salary amount. Active members who have been hired within one year of the valuation date have had their pay annualized by dividing by months of service credited, not to exceed the average non-zero active salary. For members on leave of absence at valuation date who were not on leave at the prior valuation date, the prior year's valuation pay was used. |
| Missing Data for Deferred Vested Members: | Deferred vested members without a reported benefit and without salary information were assumed to have a final average salary of \$40,000. Benefits for 1,378 deferred members were set equal to the benefit provided in 2018 increased 2% for one year of augmentation. |
| Decrement Timing: | Retirement and Termination: end of valuation year – consistent with retirements and terminations occurring at the end of the school year. Death and Disability: middle of valuation year. |
| Eligibility Testing: | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| Service Credit Accruals: | It is assumed that members accrue one year of service credit per year. Exact fractional service is used to determine the amount of benefit payable. |

Actuarial Methods and Assumptions as of July 1, 2019

Supplemental Contributions: 1996 legislation provides for a variable amortization aid contribution paid annually on July 15. We assumed the annual amortization aid contribution will equal \$838,000, which was the actual contribution for the most recent fiscal year. Additionally, annual supplemental contributions equal to \$14,827,000 are scheduled to be paid each October 1.

**Projected Annual
Payroll Calculation:**

The contributions described herein will continue until the plan is 100% funded or until June 30, 2048, whichever occurs earlier.

The census data as of July 1, 2019 reflects retirements and terminations occurring during the months of May and June; however, it does not necessarily reflect the replacements hired to fill their positions who may have hire dates in August and September. We assumed that May and June retirements are replaced by members coming in at the B.A. entry salary level of \$45,659; the Projected Annual Payroll for the fiscal year ending June 30, 2020 includes this replacement salary amount.

**Changes in Actuarial
Methods and Assumptions
Since the Prior Valuation:**

The mortality improvement scale was updated from MP-2017 to MP-2018.

APPENDIX – *State Auditor’s Report*

STATE OF MINNESOTA

Office of the State Auditor



Julie Blaha
State Auditor

The Office of the State Auditor (OSA) audits the financial statements of the SPTRFA, and has issued an unmodified opinion on the accuracy and reliability of the information provided by the statements contained in this Report. An unmodified opinion is the most favorable level of opinion that can be rendered by the OSA. This report will be published on the website of the Minnesota Office of the State Auditor, <http://www.osa.state.mn.us>, in January 2020.

ST. PAUL TEACHERS' RETIREMENT FUND ASSOCIATION
ST. PAUL, MINNESOTA

FOR THE YEAR ENDED JUNE 30, 2019

St. Paul Teachers' Retirement Fund Association
1619 Dayton Avenue, Room 309
St. Paul, MN 55104-6206