

St. Paul Teachers' Retirement Fund Association

Serving the retirement needs of St. Paul Teachers since 1909



ANNUAL REPORT

Democracy depends on Education
Education depends on Teachers

FYE 2018

ST. PAUL TEACHERS' RETIREMENT FUND ASSOCIATION

Annual Report

for the fiscal year ended June 30, 2018

*St. Paul Teachers' Retirement Fund Association
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Saint Paul, Minnesota 55104-6276*

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Jill E. Schurtz

Executive Director

Christine MacDonald

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
Feryle W. Borgeson	Trustee
Zuki Ellis	<i>Ex-Officio</i> Trustee
Michael McKay	Trustee
Karen A. Odegard	Trustee
James Paddock	Trustee
Stephanie Pignato	Trustee

SPTRFA Staff

Jill E. Schurtz	Executive Director
Christine MacDonald	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

Feryle W. Borgeson
Zuki Ellis
Michael McKay

Karen Odegard
James Paddock
Stephanie Pignato

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
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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, 2018, 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**

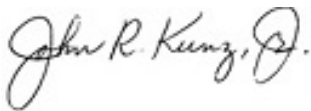
The Office of the State Auditor (OSA) audits the financial statements of the SPTRFA, and has issued an unmodified opinion on the accuracy and reliability of the information provided by the statements contained in this Report. An unmodified opinion is the most favorable level of opinion that can be rendered 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>, on January 22, 2019.

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 meet service needs of the 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 109 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, 2018

Auditor

Minnesota Office of the State Auditor

Investment Managers

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

Investment Custodian

U.S. Bank

Investment Performance Consultant

Asset Consulting Group

IT Services

Sagitec
Corporate Technologies

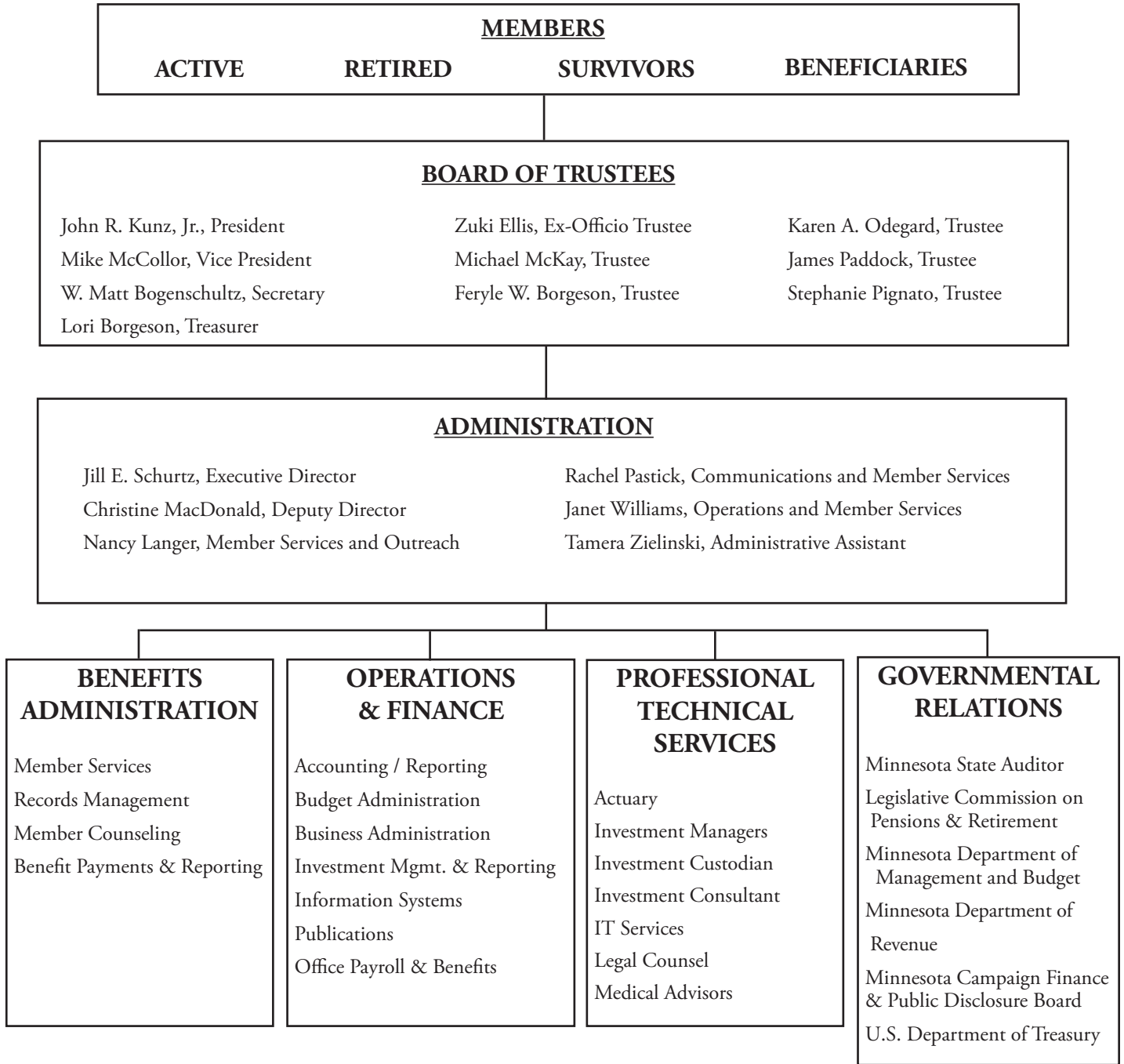
Legal Counsel

Fox Rothschild
Moss & Barnett
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 Department of Education 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, 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 affidavits 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

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 FY'18 post-retirement adjustments were based on SPTRFA's funding ratio in each of the two most recent actuarial valuations, according to the following table:

<u>Accrued Liability Funding Ratio (AVA)</u>	<u>Full COLA Rate</u>
	<u>(%)</u>
Less than 80 percent	1.0
Greater than or equal to 80 percent, but less than 90 percent	2.0
Greater than or equal to 90 percent	2.5

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 FY 2018.

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. ¹
<p>1. 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>		

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 FY 2018.

Normal Benefit	Minimum	Age	Service	Computation of Annual Benefit
Tier 1				
Unreduced	Rule of 90	62	30	$(FAS \times \text{First 10 YOS} \times \text{Multiplier}^*)$ + $(FAS \times \text{YOS greater than 10} \times \text{Multiplier}^*)$
		65	3	
Reduced	Any Age	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	$FAS \times YOS \times \text{Multiplier}^*$
Unreduced	If first employed on or after July 1, 1989:		
	66	3	$FAS \times YOS \times \text{Multiplier}^*$
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. ¹
Any Age	30	

1. 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.

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				
December 1974	46	754	3,372,453				

INVESTMENTS

Investment Returns for Fiscal Year End June 30, 2018

	<u>Assets Under Management (Market Value)</u>	<u>Fiscal Year Investment Performance</u>
Domestic Equity		
Barrow, Hanley, Mewhinney & Strauss, Inc.	47,281,715	6.63%
BlackRock S&P 500	10,118,599	14.40%
The Boston Company Asset Management	50,116,432	18.49%
Dimensional Fund Advisors, Inc.	47,294,482	15.61%
State Board of Investments - Domestic Equity	233,543,243	14.82%
Wellington Management Company, LLP	45,843,399	22.34%
	\$ 434,197,871	
International Equity		
State Board of Investments - Int'l Equity	72,097,761	7.74%
	\$ 72,097,761	
Global Equity		
BlackRock iShares ETF (new in 12/2017)	6,785,310	*
Morgan Stanley Global Franchise	66,842,643	12.86%
JP Morgan Focus	63,072,125	9.85%
	\$ 136,700,078	
Fixed Income		
Brandywine Global Opportunistic Fixed	35,773,760	-0.03%
Allianz Cash Overlay	31,697,358	5.15%
Guggenheim Core Plus	93,808,119	4.02%
	\$ 161,279,237	
Real Assets		
Securian	24,853,585	3.26%
UBS Trumbull Fund	38,203,514	7.69%
UBS Growth & Income Fund	17,143,565	8.90%
Tortoise MLP	21,750,028	-1.22%
Dune Realty Partners	4,725,978	12.47%
Parametric - TIPS	10,902,865	1.99%
	\$ 117,579,536	
Private Equity		
Franklin Park	37,757,909	
North Sky	6,530,311	
RWI Ventures I	241,481	
RWI Ventures II	327,692	
TCW LLC	8,607,680	
VIA Partners	2,622,766	
	\$ 56,087,839	16.95%
Alternatives		
Parametric Defensive Equity	29,206,900	7.06%
	\$ 29,206,900	
Opportunistic		
Corvex	8,104,015	6.07%
Entrust	20,234,482	1.74%
	\$ 28,338,497	
Cash		
Cash - US Bank Custody	15,727,033	0.88%
Cash - US Bank Checking	10,844,177	
Parametric Cash Overlay	1,984,738	3.37%
	\$ 28,555,948	
Total Fund (net of fees)	\$ 1,064,043,667	9.75%
Total Fund Benchmark		9.20%

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2018

Asset Class / Security Type / Issuer	Cost	Market Value	Accrued Interest or Dividends	Mkt + Accrued
Cash or Equivalents				
U.S. Bank Commercial Paper Sweep & Cash	\$ 10,844,177	\$ 10,844,177		10,844,177
Custodian Short Term Investment Pool	30,108,329	30,118,088		30,118,088
Subtotal - Cash or Equivalents	<u>\$ 40,952,506</u>	<u>\$ 40,962,265</u>	<u>\$ -</u>	<u>\$ 40,962,265</u>
Domestic Equity Securities				
2U Inc	\$ 296,108	\$ 300,816	\$ -	300,816
Acadia Healthcare Co Inc	798,576	594,872	-	594,872
Acxiom Corp	1,217,205	1,400,372	-	1,400,372
Adient Ltd	703,210	568,341	-	568,341
Advanced Micro Devices Inc	838,241	1,022,393	-	1,022,393
Advanced Micro Devices Inc	613,011	749,455	-	749,455
Agree Rlty Corp	328,042	364,113	3,726	367,839
Air Prods Chemicals Inc	1,158,866	1,455,764	10,283	1,466,047
Alexandria Real Estate Equities Inc	662,490	845,339	6,231	851,570
Ally Financial Inc	674,782	722,688	-	722,688
Altria Group Inc	360,243	1,225,869	15,680	1,241,549
American Campus Communities	436,455	458,816	-	458,816
American Express Co	803,086	1,435,700	-	1,435,700
American Homes 4 Rent A	277,164	268,378	550	268,928
American International Group	1,320,741	1,154,723	-	1,154,723
Andeavor Logistics LP	1,040,848	833,716	-	833,716
Antero Midstream Partners LP	575,980	599,463	-	599,463
Antero Resources Midstream	177,705	147,674	-	147,674
Anthem Inc	270,684	642,205	-	642,205
Aramark	1,603,375	1,583,168	-	1,583,168
Arch Coal Inc	198,700	215,918	-	215,918
Autodesk Inc	259,370	480,183	-	480,183
Avalonbay Cmnty Inc	1,052,488	1,100,096	9,408	1,109,504
Avis Budget Group Inc	855,513	953,063	-	953,063
Bank Of New York Mellon Corp	464,232	492,381	-	492,381
Black Knight Inc	536,958	639,441	-	639,441
Blackbaud Inc	566,253	700,348	-	700,348
Boston Pptys Inc	316,826	336,000	2,143	338,143
BP Midstream Partners LP	209,248	247,640	-	247,640
BP PLC Spon A D R	1,018,980	1,027,350	-	1,027,350
Bright Horizons Family Solut	912,694	1,159,706	-	1,159,706
Buckeye Partners LP	1,072,272	546,442	-	546,442
Cabot Corp	419,674	413,180	-	413,180
Cabot Oil Gas Corp Cl A	1,152,067	1,139,711	-	1,139,711
Camden Ppty Tr Sbi	631,806	647,023	5,467	652,490
Cannae Holdings Inc	179,493	151,461	-	151,461
Cardinal Health Inc	550,137	411,393	4,013	415,406
Cardinal Health Inc	1,091,181	828,157	8,078	836,235
CDW Corp De	563,035	1,193,268	-	1,193,268
Centene Corp	476,162	742,710	-	742,710
Ceridian Hcm Holding Inc	228,934	209,263	-	209,263
Cheniere Energy Inc	533,850	538,209	-	538,209
Cheniere Energy Inc	180,143	227,774	-	227,774
Chevron Corporation	179,401	487,388	-	487,388
Ciena Corp	1,156,674	1,483,394	-	1,483,394
Citigroup Inc	535,133	864,874	-	864,874
Cognex Corp	237,242	230,411	-	230,411
Comcast Corp Class A	1,525,906	1,379,726	-	1,379,726
Commvault Systems Inc	133,167	145,265	-	145,265
Conocophillips	452,050	1,025,711	-	1,025,711
Cousins Pptys Inc	217,702	236,436	-	236,436
Criteo Sa Spon A D R	591,891	593,205	-	593,205
CVS Health Corporation	1,739,660	1,382,882	-	1,382,882
Cyrusone Inc	524,336	601,108	4,738	605,846

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2018

Asset Class / Security Type / Issuer	Cost	Market Value	Accrued Interest or Dividends	Mkt + Accrued
Dave Busters Entertainmen	256,544	257,421	-	257,421
Delek Holdco Inc	466,877	638,965	-	638,965
Delphi Technologies PLC	1,006,080	942,749	-	942,749
Deluxe Corp	598,804	549,675	-	549,675
Dentsply Sirona Inc	591,511	398,876	797	399,673
Dexcom Inc	460,197	750,057	-	750,057
Digital Realty Trust Inc	890,800	903,798	-	903,798
Dollar General Corp	1,071,360	1,453,758	-	1,453,758
Dominion Energy Inc	498,665	520,350	-	520,350
Dominos Pizza Inc	482,505	829,862	-	829,862
Dowdupont Inc	1,374,505	1,443,318	-	1,443,318
Duke Realty Corporation	533,825	699,623	-	699,623
E Trade Financial Corp	175,574	675,573	-	675,573
Eagle Materials Inc	1,055,079	975,276	929	976,205
East West Bancorp Inc	806,853	801,243	-	801,243
Eaton Vance Corp	633,666	683,324	-	683,324
Edwards Lifesciences Corp	633,275	956,249	-	956,249
Electronic Arts Inc	199,614	380,472	-	380,472
Energy Transfer Equity L P	1,128,642	1,211,726	-	1,211,726
Energy Transfer Partners L P	1,299,752	998,248	-	998,248
Enterprise Prods Partners L P	2,101,913	2,089,472	-	2,089,472
Eqst Gp Holdings LP	118,229	92,018	-	92,018
Eqst Midstream Partners LP	1,406,790	1,024,939	-	1,024,939
Equifax Inc	498,715	534,345	-	534,345
Equinix Inc	943,306	1,114,705	-	1,114,705
Equity Lifestyle Pptys Inc	193,221	202,180	1,210	203,390
Equity Residential	528,071	547,734	4,644	552,378
Essex Ppty Tr Inc	542,506	596,241	4,639	600,879
Evolent Health Inc A	651,141	937,841	-	937,841
Exelon Corporation	737,221	833,384	-	833,384
Expedia Inc	1,047,536	1,165,122	-	1,165,122
Express Scripts Hldgs C	1,315,222	1,495,558	-	1,495,558
Extended Stay America Inc	660,058	815,518	-	815,518
Extra Space Storage Inc	402,523	548,955	-	548,955
Factset Research Systems Inc	657,204	750,997	-	750,997
Federal Rlty Invnt Tr Sbi New	398,040	392,305	3,100	395,405
Finisar Corporation	510,682	587,646	-	587,646
First Data Corp Class A	687,599	851,265	-	851,265
First Indl Rlty Tr Inc	138,390	153,364	1,001	154,365
First Interstate Bancsys Mt	408,660	476,396	-	476,396
First Republic Bank San Fran	698,593	866,561	-	866,561
Flex Ltd	1,237,566	1,084,015	-	1,084,015
Fluor Corp	979,609	981,990	4,343	986,333
G1 Therapeutics Inc	494,158	494,922	-	494,922
Gartner Inc	1,626,959	2,103,940	-	2,103,940
General Dynamics Corp	284,136	682,633	-	682,633
General Electric Co	1,685,095	981,458	8,979	990,437
GGP Inc	186,566	157,311	-	157,311
Global Payments Inc	937,122	1,507,010	-	1,507,010
Goldcorp Inc	614,572	613,372	-	613,372
Graco Inc	525,023	513,699	-	513,699
Grand Canyon Education Inc	173,223	465,414	-	465,414
Great Western Bancorp Inc	628,545	643,497	-	643,497
Grubhub Inc	79,159	224,612	-	224,612
Guidewire Software Inc	402,528	615,157	-	615,157
HCP Inc	646,668	663,574	-	663,574
Healthcare Rlty Tr	79,868	84,332	-	84,332
Healthcare Trust Of Ame Cl A	392,545	377,440	-	377,440

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2018

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Hexcel Corp New	624,951	866,126	-	866,126
Highwoods Properties Inc	331,876	360,183	-	360,183
Hilton Worldwide Hldgs Wi	313,147	382,184	-	382,184
Hilton Worldwide Hldgs Wi	443,275	506,624	-	506,624
Host Hotels Resorts Inc	776,683	857,760	8,142	865,902
Hunt J B Trans Svcs Inc	339,425	450,221	-	450,221
Huntsman Corp	1,030,097	943,394	-	943,394
iShares Russell 2000 ETF	248,485	251,387	-	251,387
Icon PLC	123,194	270,361	-	270,361
IHS Markit Ltd	930,212	1,282,476	-	1,282,476
Illumina Inc	158,999	323,976	-	323,976
Incyte Corp	927,462	701,289	-	701,289
Infinera Corp	847,541	947,878	-	947,878
Integrated Device Technology Inc	236,513	239,929	-	239,929
Invitation Homes Inc	695,188	703,330	-	703,330
Itron Inc	269,010	243,683	-	243,683
J P Morgan Chase Co	582,942	1,561,333	-	1,561,333
Jazz Pharmaceuticals PLC	911,922	1,196,968	-	1,196,968
Jefferies Financial Group Inc Com	1,267,147	1,271,098	-	1,271,098
Johnson Ctls Intl PLC	1,701,943	1,331,912	10,743	1,342,655
Johnson Johnson	941,476	1,379,757	-	1,379,757
Keysight Technologies Inc	511,097	503,349	-	503,349
Kilroy Rlty Corp	576,785	642,940	3,868	646,808
Kinross Gold Corp	570,076	496,339	-	496,339
KLA Tencor Corporation	276,188	243,816	-	243,816
Knight Swift Transportation	667,509	793,049	-	793,049
Lexicon Pharmaceuticals Inc	227,456	229,452	-	229,452
Liberty Formula One Common Stock	612,497	623,635	-	623,635
Liberty Ppty Tr Sbi	531,529	607,321	5,480	612,801
Lincoln Elec Hldgs Inc	587,430	562,454	2,500	564,953
Logmein Inc	350,302	315,739	-	315,739
Lowes Co Inc	1,312,706	1,607,679	-	1,607,679
Lumentum Holdings Inc W I	175,395	203,287	-	203,287
M G I C Invt Corp	663,439	738,544	-	738,544
Magellan Midstream Partners LP	1,710,114	1,971,336	-	1,971,336
Marketaxess Hldgs Inc	579,810	796,980	-	796,980
Maxim Integrated Prods Inc	341,102	434,553	-	434,553
Maxlinear Inc Class A	206,910	158,893	-	158,893
Medtronic PLC	1,402,246	1,559,215	-	1,559,215
Microsoft Corp	249,177	1,301,849	-	1,301,849
Mid-Amer Apt Cmnty Inc	113,565	120,804	-	120,804
Middleby Corp	958,421	837,448	-	837,448
MPLX LP	1,975,069	1,669,924	-	1,669,924
MSCI Inc	383,895	790,425	-	790,425
Mylan Nv	541,676	507,442	-	507,442
National Retail Properties Inc	229,861	241,780	-	241,780
Nektar Therapeutics	344,492	176,520	-	176,520
Netapp Inc	384,871	663,500	-	663,500
Newell Brands Inc	980,036	902,057	-	902,057
Nexstar Broadcasting Group A	236,495	318,923	-	318,923
Nielsen Holdings PLC	835,485	688,687	-	688,687
Nielsen Holdings PLC	874,335	661,716	-	661,716
Noble Midstream Partners LP	108,454	186,420	-	186,420
Norwegian Cruise Line Holdings Ltd	563,552	512,237	-	512,237
Norwegian Cruise Line Holdings Ltd	259,278	230,297	-	230,297
Nuance Communications Inc	613,688	491,210	-	491,210
O Reilly Automotive Inc	438,391	493,794	-	493,794
Occidental Petroleum Corporation	956,317	1,658,454	15,836	1,674,290
Onemain Holdings Inc	1,220,730	1,212,988	-	1,212,988

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2018

Asset Class / Security Type / Issuer	Cost	Market Value	Accrued Interest or Dividends	Mkt + Accrued
Oneok Inc	670,380	1,305,123	-	1,305,123
Oracle Corporation	1,195,601	1,290,782	-	1,290,782
Parsley Energy Inc Class A	970,195	1,016,833	-	1,016,833
PBF Energy Inc Class A	509,152	574,860	-	574,860
Penn National Gaming Inc	296,998	449,535	-	449,535
Pfizer Inc	1,111,699	1,470,356	-	1,470,356
Philip Morris Intl	621,863	1,058,178	15,504	1,073,682
Phillips 66	754,255	1,337,051	-	1,337,051
Phillips 66 Partners LP	1,017,067	1,062,508	-	1,062,508
Physicians Realty Trust	123,776	125,926	-	125,926
Plains All Amer Pipeline LP	2,645,449	1,422,679	-	1,422,679
PRA Health Sciences Inc	501,199	518,895	-	518,895
Prologis Inc	642,183	968,928	-	968,928
Public Storage Inc	965,264	1,088,928	-	1,088,928
Qualcomm Inc	1,451,198	1,249,287	-	1,249,287
Realty Income Corp	308,960	285,087	1,166	286,253
Regency Centers Corporation	694,455	666,925	-	666,925
Retail Opportunity Investments Corp	151,400	155,196	-	155,196
RLJ Lodging Trust	123,489	127,890	1,914	129,804
Ross Stores Inc	400,669	652,575	-	652,575
RSP Premian Inc	487,205	516,399	-	516,399
Sage Therapeutics Inc	301,759	842,914	-	842,914
Sanofi A D R	1,010,360	1,048,262	-	1,048,262
SBA Communications Corp	846,688	1,095,736	-	1,095,736
SBA Communications Corp	323,734	313,728	-	313,728
Schlumberger Ltd	1,439,617	1,398,581	5,376	1,403,957
Scorpio Tankers Inc	436,071	395,836	-	395,836
Seaspan Corp 6.375% Pfd	163,659	166,518	-	166,518
Seattle Genetics Inc /Wa	804,003	1,006,804	-	1,006,804
Servicenow Inc	433,381	872,698	-	872,698
Shell Midstream Partners L P	832,539	643,641	-	643,641
Simon Property Group Inc	1,378,894	1,525,753	-	1,525,753
Simpson Mfg Co Inc	278,556	294,718	-	294,718
Sinclair Broadcast Group Inc A	951,835	1,019,316	-	1,019,316
Skywest Inc	822,225	865,225	1,667	866,892
SL Green Rlty Corp	789,179	774,081	6,256	780,337
SLM Corp	360,936	569,328	-	569,328
Splunk Inc	414,265	493,568	-	493,568
SS C Technologies Holdings	1,103,329	1,328,069	-	1,328,069
Stamps Com Inc	75,720	140,443	-	140,443
Store Capital Corp	341,609	386,340	4,371	390,711
Summit Hotel Properties Inc	152,128	141,669	-	141,669
Sun Cmnty Inc	581,260	724,312	5,254	729,566
Sunstone Hotel Invs Inc	204,518	239,328	720	240,048
SVB Finl Group	753,999	818,923	-	818,923
Tahoe Resources Inc	404,368	415,297	-	415,297
Take-Two Interactive Software Inc	576,670	924,628	-	924,628
Talend Sa A D R	810,844	1,184,254	-	1,184,254
Tallgrass Energy Gp LP	84,810	85,427	-	85,427
Tallgrass Energy Partners L P	618,507	614,396	-	614,396
Targa Resources Corp	468,063	404,680	-	404,680
Teradyne Inc	398,301	405,826	-	405,826
Teradyne Inc	475,498	463,616	-	463,616
Texas Instruments Inc	342,458	1,519,245	-	1,519,245
Therapeutics Md Inc	1,704,943	1,535,951	-	1,535,951
Transunion	467,433	1,027,174	-	1,027,174
Trinet Group Inc	114,694	328,871	-	328,871
UDR Inc	580,136	611,902	-	611,902

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2018

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Anchorage Credit Funding LTD C L O Ser 2016 4A Cl A :	1,000,000.00	1,000,000.00	13,222.22	1,013,222
Angel Oak Mortgage 2.708% 11/25/47	740,216.96	735,279.60	1,670.44	736,950
Apollo Aviation 4.875% 3/17/36	720,177.78	745,978.80	1,582.95	747,562
Army Hawaii Family 5.750% 6/15/50	490,000.00	513,000.60	1,252.22	514,253
Army Hawaii Family 5.750% 6/15/50	490,000.00	512,995.70	1,252.22	514,248
Assurant Inc 3.54155% 3/26/21	250,000.00	250,627.50	122.97	250,750
Atlantic Marine Corp 5.433% 12/01/50	225,014.77	233,836.09	1,059.67	234,896
Atlas Senior Loan Fund LTD C L O Ser 2018 9A Cl A 04/	1,000,000.00	1,000,000.00	0.03	1,000,000
Banc Of America 2.23113% 9/26/36	527,267.16	568,456.00	174.60	568,631
BCAP LLC Trust 2.69094% 3/26/36	304,727.87	323,577.84	95.69	323,674
Beverly Hills Ca Unif 8/01/37	151,315.50	164,633.00	-	164,633
Cal Funding LTD 3.960% 2/25/43	966,365.65	963,148.00	638.00	963,786
Capmark Military 5.12958% 2/10/52	712,910.64	697,895.82	2,380.63	700,276
Capmark Military Hsg 7.976% 7/10/55	900,750.38	1,199,175.76	3,818.54	1,202,994
Carlyle Global Market C L O Ser 2015 2A Cl A1R 04/27,	1,003,622.52	1,000,000.00	0.01	1,000,000
Castlelake Aircraft 4.703% 12/15/40	594,142.20	599,829.93	1,241.94	601,072
Catamaran Clo LTD C L O Ser 2014 2A Cl Br 10/18/202	750,000.00	753,495.00	7,221.29	760,716
Cerberus C L O Ser 2018 2A Cl A 04/15/2028 V	1,000,000.00	1,000,000.00	6,188.32	1,006,188
Cerberus Onshore li Clo LLC C L O Ser 2016 3A Cl A 01/	1,000,000.00	1,005,010.00	10,432.84	1,015,443
CFCRE Commercial 1.21823% 1/10/48	468,614.78	373,140.29	5,985.72	379,126
Chesterfield 4.500% 12/15/34	309,500.00	310,997.98	619.01	311,617
Cit Mortgage Loan 3.86499% 10/25/37	1,400,736.70	1,426,053.96	831.77	1,426,886
Citigroup Commerci 1.9537% 4/10/49	493,815.94	400,817.61	6,188.35	407,006
Citigroup Inc 6.250% 12/29/49	394,936.41	396,325.00	10,678.13	407,003
Credit Suisse 2.19877% 11/30/37	790,095.75	901,390.28	1,853.83	903,244
Diamond Head 3.810% 7/14/28	509,063.48	508,751.44	916.12	509,668
Dryden Senior Loan Fund C L O Ser 2015 37A Cl Q 04/:	974,283.00	897,310.00	0.02	897,310
Emerald Aviation 4.650% 10/15/38	770,335.00	768,351.42	1,578.83	769,930
Emerald Aviation 6.350% 10/15/38	331,203.87	336,842.67	937.40	337,780
F H L M C Deb Zero 12/14/29	654,147.50	676,700.00	-	676,700
F H L M C MLTCL 1.37165% 11/25/55	1,097,297.61	1,076,184.78	2,014.30	1,078,199
F H L M C MLTCL MT 2.16307% 6/25/57	924,199.24	903,714.53	1,739.71	905,454
F H L M C MLTCL Mtg 3.000% 10/25/27	1,001,624.00	960,600.00	2,500.00	963,100
F H L M C MLTCL Mtg 3.019% 6/25/27	875,458.35	820,802.50	2,138.46	822,941
F H L M C MLTCL Mtg 3.450% 1/25/28	1,002,749.00	991,820.00	2,875.00	994,695
F H L M C MLTCL Mtg 3.600% 2/25/28	1,011,469.00	1,006,300.00	3,000.00	1,009,300
F H L M C MLTCL Mtg 2.6174% 7/25/56	771,476.21	914,603.15	2,379.37	916,983
F H L M C Strip 3/15/31	1,471,553.05	1,519,651.00	-	1,519,651
F H L M C Strip 7/15/32	183,102.00	185,319.00	-	185,319
F N M A Strip 1/15/30	391,557.00	404,760.00	-	404,760
F N M A Strip 5/15/29	1,119,516.00	1,141,140.00	-	1,141,140
F N M A Strip 5/15/30	305,269.50	300,136.50	-	300,137
F N M A #AN3292 2.860% 9/01/29	553,093.75	517,044.00	1,310.82	518,355
F N M A #AN6349 2.990% 9/01/29	500,312.50	471,875.00	1,245.81	473,121
F N M A #AN7049 3.050% 10/01/29	505,625.00	474,990.00	1,270.77	476,261
F N M A #AN7843 3.180% 12/01/29	510,234.38	484,400.00	1,325.00	485,725
F N M A #AN8031 3.030% 2/01/30	1,000,625.00	950,350.00	2,525.00	952,875
F N M A #AN8173 3.230% 1/01/30	1,015,452.06	963,628.99	2,674.95	966,304
F N M A #AN8193 3.170% 1/01/30	1,377,449.22	1,346,254.00	3,698.33	1,349,952
F N M A #AN8194 3.220% 1/01/30	1,088,355.47	1,062,787.00	2,951.67	1,065,739
F N M A GTD Remic 2.980% 8/25/29	1,002,204.00	945,770.00	2,483.33	948,253
FD Limited C L O Ser 2016 2A Cl A 4.285 05/12/2031	999,000.00	1,000,000.00	5,594.31	1,005,594
Flagship Clo C L O Ser 2014 8A Cl Brr 01/16/2026	1,007,982.94	1,000,000.00	-	1,000,000
Fort Benning Fam 1.66199% 1/15/36	582,187.50	625,867.50	5,747.73	631,615
Fortress Credit Opportunities C L O Ser 2016 7A Cl A11	1,000,000.00	1,009,650.00	1,896.56	1,011,547
Fortress Credit Opportunities Clo C L O Ser 2017 9A Cl	1,000,000.00	1,000,000.00	8,333.19	1,008,333
Gahr Commercial 3.4949% 12/15/34	1,012,654.29	996,880.00	1,553.29	998,433
Gasco 5.000% 10/25/39	0.33	229,989.52	1,469.38	231,459

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Gasco 6.500% 10/25/39	0.33	233,275.09	1,937.48	235,213
GE WMC Mortgage 2.81999% 12/25/35	841,088.30	838,709.94	356.80	839,067
Gmac Commercial 6.240% 10/10/41	347,585.03	392,994.09	1,329.57	394,324
GMH Military Hsg 6.298% 10/15/49	507,843.50	486,193.10	6,448.45	492,642
Golub Capital 0.00001% 2/05/31	1,000,000.00	1,000,000.00	0.03	1,000,000
GSAA Home Equity 2.97949% 6/25/35	1,078,875.00	1,191,432.00	538.30	1,191,970
Hospitality 5.250% 2/15/26	154,425.06	160,317.86	3,133.67	163,452
JP Morgan Chase 1.2638% 3/15/50	524,637.13	451,219.24	7,312.00	458,531
Lancer Fin Spv LTD A B S Ser 2010 Ser 144A 5.850 12/	235,027.42	23.21	-	23
Madison Park Funding LTD C L O Ser 2015 16A CI A2R 1	1,000,000.00	1,001,240.00	5,713.00	1,006,953
Mountain View Clo LTD C L O Ser 2014 1A CI Arr 10/15	1,000,000.00	1,000,000.00	-	1,000,000
N Star Real Estate Cdo LTD C D O Ser 2006 8A CI A2 02	507,999.73	526,383.48	1,086.98	527,470
Newport Mesa Ca	234,342.00	243,606.00	-	243,606
Northern Group 6.803% 8/15/53	400,000.00	499,348.00	1,209.42	500,557
Oak Hill Credit Partners A B S Ser 2013 9A CI Acom 10/	950,356.17	875,100.00	11,019.67	886,120
Ozlm LTD C L O Ser 2014 9A CI A2R 01/20/2027	1,000,000.00	1,000,310.00	6,638.52	1,006,949
Raspro Trust 3.01681% 3/23/24	710,255.51	723,393.73	4,899.66	728,293
Reynolds Grp Iss 5.77337% 7/15/21	101,250.00	100,930.00	1,087.82	102,018
Senior Housing 4.750% 2/15/28	98,053.00	96,612.00	1,834.03	98,446
Store Master Funding 3.960% 10/20/46	969,738.14	931,442.47	1,174.00	932,616
Store Master Funding 4.170% 4/20/45	491,827.89	485,932.19	626.98	486,559
T V A 5.375% 4/01/56	399,187.80	444,246.00	4,434.38	448,680
Taco Bell Funding 4.970% 5/25/46	812,625.00	813,586.36	3,916.36	817,503
TCP Waterman Clo LLC C L O Ser 2016 1A CI A1J 12/15	1,000,000.00	1,016,450.00	2,010.14	1,018,460
Textainer Marine 3.720% 5/20/42	894,953.75	889,363.35	1,017.30	890,381
The Bancorp 3.43235% 1/15/33	1,000,000.00	1,001,430.00	1,477.00	1,002,907
Thomson Reuters Corp 3.850% 9/29/24	12,804.09	12,805.52	127.91	12,933
Towd Point 3.000% 1/25/58	938,543.60	924,704.68	2,347.87	927,053
Towd Point Mortgage 2.750% 10/25/57	889,451.72	887,600.53	2,087.25	889,688
TPG Real Estate 0.97271% 4/15/35	1,000,000.00	1,000,000.00	1,254.78	1,001,255
Treman Park Clo LTD C L O Ser 2015 1A CI Com 04/20/	472,754.70	438,370.00	7,055.50	445,426
Turbine Engine 5.125% 12/13/48	435,750.31	429,340.73	996.60	430,337
TVA 4.250% 9/15/65	507,115.00	566,335.00	6,256.94	572,592
U S Treas BD Strip 11/15/44	1,924,750.66	2,009,840.79	-	2,009,841
U S Treas BD Strip 11/15/46	6,392,469.05	6,533,312.64	-	6,533,313
U S Treasury I P S 0.125% 4/15/20	2,081,105.96	2,056,347.96	548.10	2,056,896
U S Treasury I P S 0.250% 1/15/25	1,598,891.60	1,599,629.15	1,881.24	1,601,510
U S Treasury I P S 0.500% 4/15/23	1,608,585.96	1,610,678.72	1,370.51	1,612,049
U S Treasury I P S 1.375% 2/15/44	1,686,495.09	1,684,613.91	7,795.86	1,692,410
U S Treasury I P S 2.375% 1/15/27	2,825,499.44	2,825,899.34	27,220.97	2,853,120
U S Treasury I P S 3.875% 4/15/29	1,070,667.76	1,036,657.70	6,410.27	1,043,068
Venture Cdo LTD C L O Ser 2012 12A CI Arr 02/28/202	1,000,000.00	1,000,000.00	2,859.43	1,002,859
Verizon 3.4425% 5/15/25	100,000.00	99,887.00	449.44	100,336
VMC Finance LLC 2.88731% 4/15/35	965,480.32	965,480.32	1,241.50	966,722
Wells Fargo 1.69947% 1/15/59	680,290.79	517,812.85	9,594.96	527,408
Wells Fargo Coml 1.14845% 12/17/49	361,989.54	301,300.76	2,564.50	303,865
Wells Fargo Tr 1.45719% 1/15/59	489,879.27	391,212.45	6,530.97	397,743
Willis Engine Secur 5.500% 9/15/37	317,830.97	313,233.18	778.86	314,012
Yamana Gold Inc 4.950% 7/15/24	339,738.65	352,615.23	8,057.23	360,672
Subtotal - Fixed Income	\$ 94,431,862	\$ 94,754,747	# \$ 330,547	\$ 95,085,293
Real Estate Commingled Fund				
UBS Trumbull Property Fund	22,995,236	38,203,514		38,203,514
UBS Growth & Income Fund	10,306,703	17,143,565		17,143,565
Dune Real Estate Partners	3,229,078	4,725,978		4,725,978
Subtotal - Real Estate Commingled	\$ 36,531,018	\$ 60,073,058	\$ -	# \$ 60,073,058

Holdings by Asset Class, Security Type, and Issuer as of June 30, 2018

<u>Asset Class / Security Type / Issuer</u>	<u>Cost</u>	<u>Market Value</u>	<u>Accrued Interest or Dividends</u>	<u>Mkt + Accrued</u>
Private Equity				
North Sky - PEP IV Fund	4,672,788	6,530,311		6,530,311
Franklin Park Private Equity Fund	31,580,556	37,757,909		37,757,909
RWI Group - Ventures I Capital Ltd Ptnr	240,761	241,481		241,481
RWI Group - Ventures II Capital Ltd Ptnr	3,059,614	327,692		327,692
VIA Fund III	2,091,275	2,622,766		2,622,766
Subtotal - Private Equity	<u>\$ 41,644,994</u>	<u>\$ 47,480,159</u>	<u>\$ -</u>	<u>\$ 47,480,159</u>
Private Equity / Alternative				
TCW	7,989,533	7,875,735		7,875,735
Parametric Def Eq Fund	24,000,000	29,206,900		29,206,900
Subtotal - Private Equity / Alternative	<u>\$ 31,989,533</u>	<u>\$ 37,082,635</u>	<u>\$ -</u>	<u>\$ 37,082,635</u>
Opportunistic				
Corvex	8,102,196	8,104,015		8,104,015
Entrust	18,217,882	20,234,482		20,234,482
Subtotal - Opportunistic	<u>\$ 26,320,078</u>	<u>\$ 28,338,497</u>	<u>\$ -</u>	<u>\$ 28,338,497</u>
TOTAL FUND	<u><u>\$ 809,964,149</u></u>	<u><u>\$ 1,064,043,667</u></u>	<u><u>\$ 545,200</u></u>	<u><u>\$ 1,064,588,868</u></u>

ACTUARIAL SECTION

December 7, 2018

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, 2018. This report provides, among other things, the required annual contribution rate of the Fund for the Plan Year commencing July 1, 2018 and ending on June 30, 2019, according to prescribed assumptions.

The valuation was based upon data and information through June 30, 2018 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 11, 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.

Ms. Jill E. Schurtz
St. Paul Teachers' Retirement Fund Association
December 7, 2018
Page 2

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.

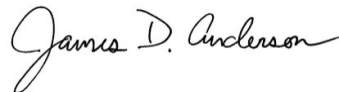
This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. Bonita J. Wurst and James D. Anderson are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the 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

BJW/JDA:bd

Summary of Valuation Results

(Dollars in Thousands)

	July 1, 2017 Valuation	July 1, 2018 Valuation
A. CONTRIBUTIONS % OF PAYROLL (Table 11)		
1. Statutory Contributions - Chapter 354A	21.64%	24.23%
2. Required Contributions - Chapter 356	22.16%	21.54%
3. Sufficiency / (Deficiency)	(0.52%)	2.69%
B. FUNDING RATIOS		
1. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	\$ 1,038,467	\$ 1,067,675
b. Actuarial Accrued Liability (Table 9)	1,611,208	1,676,193
c. Funding Ratio	64.45%	63.70%
2. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	\$ 1,773,650	\$ 2,004,176
b. Current and Expected Future Benefit Obligations	1,847,501	1,869,580
c. Funding Ratio	96.00%	107.20%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	3,409	3,445
b. Projected Annual Earnings	\$ 280,785	\$ 281,782
c. Average Annual Earnings (Projected dollars)	\$ 78,060	\$ 77,704
d. Average Age	44.8	44.8
e. Average Service	12.7	12.7
f. Members on Leave of Absence	141	132
2. Others		
a. Service Retirements (Table 4)	3,478	3,547
b. Disability Retirements (Table 5)	30	25
c. Survivors (Table 6)	343	342
d. Deferred Retirements (Table 7)	2,034	2,031
e. Terminated Other Non-Vested (Table 7)	2,945	3,014
f. Total - Others	8,830	8,959
3. Grand Total (1.a + 1.f + 2.f)	12,380	12,536

Accounting Balance Sheet as of June 30, 2018 (dollars in thousands)

	Market Value	Cost Value
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	\$ 4,984	\$ 4,984
2. Investments		
a. Fixed Income	172,947	166,023
b. Equity	666,356	455,622
c. Real Assets	70,887	47,402
d. Alternative	112,901	99,955
e. Cash and Cash Equivalents	40,953	40,962
3. Other Assets	2,766	2,766
B. TOTAL ASSETS	\$ 1,071,794	\$ 817,714
C. AMOUNTS CURRENTLY PAYABLE	\$ 1,222	\$ 1,222
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	\$ 199,900	\$ 199,911
2. Employer Reserves	870,672	616,581
3. Total Assets Available for Benefits	\$ 1,070,572	\$ 816,492
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	\$ 1,071,794	\$ 817,714
F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Market Value of Assets Available for Benefits (D.3)	\$ 1,070,572	
2. Unrecognized Asset Returns		
a. June 30, 2018	\$ 15,610	
b. June 30, 2017	54,191	
c. June 30, 2016	(77,451)	
d. June 30, 2015	(55,629)	
3. UAR Adjustment: $.80 * 2(a) + .60 * 2(b) + .40 * 2(c) + .20 * 2(d)$	2,897	
4. Actuarial Value of Assets: (F.1 - F.3)	\$ 1,067,675	

DERIVATION OF OTHER ASSETS *	Market Value
Accounts Receivable	
Employer Contribution	\$ 458
Employee Contribution	287
Service Purchases Receivable	-
Pensions Receivable	31
State Contributions	838
Real Estate Income Receivable	85
Commission Recapture Receivable	2
Interest Receivable	67
Dividend Receivable	415
Misc. Receivable	-
Escrow Funds receivable	-
Sale of Securities	549
Total Accounts Receivable	\$ 2,731
Fixed Assets	35
Total Other Assets	\$ 2,766

**Numbers may not add due to rounding.*

Change(s) in Assets Available for Benefits as of June 30, 2018 (dollars in thousands)

	Market Value	Cost Value
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	\$ 1,032,249	\$ 818,711
B. OPERATING REVENUES		
1. Member Contributions	\$ 20,112	\$ 20,112
2. Employer Contributions	28,199	28,199
3. Supplemental Contributions	10,665	10,665
4. Reemployed Annuitant Employer Contributions	345	345
5. Investment Income	12,112	12,112
6. Investment Expenses	(4,356)	(4,356)
7. Net Realized Gain / (Loss)	47,588	47,588
8. Other	0	0
9. Net Change in Unrealized Gain / (Loss)	40,542	0
10. Total Operating Revenue	\$ 155,207	\$ 114,665
C. OPERATING EXPENSES		
1. Service Retirements	\$ 103,244	\$ 103,244
2. Disability Benefits	489	489
3. Survivor Benefits	11,565	11,565
4. Refunds	800	800
5. Administrative Expenses	786	786
6. Total Operating Expenses	\$ 116,884	\$ 116,884
D. OTHER CHANGES IN RESERVES	\$ 0	\$ 0
E. ASSETS AVAILABLE AT END OF PERIOD	\$ 1,070,572	\$ 816,492
F. DETERMINATION OF CURRENT YEAR UNRECOGNIZED ASSET RETURN		
1. Average Balance		
(a) Assets available at BOY		\$ 1,032,249
(b) Assets available at EOY		1,070,572
(c) Average balance $\{[(a) + (b) - \text{Net Investment Income}] / 2\}$ {Net investment income: B.5+B.6+B.7+B.9}		\$ 1,003,468
2. Expected Return: $.080 * F.1$		80,277
3. Actual Return		95,887
4. Current Year Gross Asset Gain/(Loss): $F.3 - F.2$		\$ 15,610

Actuarial Balance Sheet as of July 1, 2018 (dollars in thousands)

A. CURRENT ASSETS (TABLE 1; Line F.4)	\$	1,067,675
B. EXPECTED FUTURE ASSETS		
1. Present Value of Expected Future Statutory Supplemental Contributions*	\$	743,114
2. Present Value of Future Normal Costs		193,387
3. Total Expected Future Assets	<u>\$</u>	<u>936,501</u>
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS	<u>\$</u>	<u>2,004,176</u>
D. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS	<u>\$</u>	<u>1,869,580</u>
E. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (D - C)	\$	(134,596)

* 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, 2018 (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	\$ 592,898	\$ 123,011	\$ 469,887
b. Disability Benefits	\$ 14,405	\$ 4,551	\$ 9,854
c. Surviving Spouse and Child Benefits	\$ 5,964	\$ 1,673	\$ 4,291
d. Vested Withdrawals	\$ 42,349	\$ 47,745	\$ (5,396)
e. Refund Liability Due to Death or Withdrawal	\$ 2,250	\$ 16,407	\$ (14,157)
f. Total	\$ 657,866	\$ 193,387	\$ 464,479
2. Deferred Retirements	\$ 79,052	\$ 0	\$ 79,052
3. Former Members without Vested Rights	\$ 2,798	\$ 0	\$ 2,798
4. Annuitants	\$ 1,129,864	\$ 0	\$ 1,129,864
5. Total	\$ 1,869,580	\$ 193,387	\$ 1,676,193
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. Actuarial Accrued Liability (A.5)			\$ 1,676,193
2. Current Assets (Table 1; Line F.4)			\$ 1,067,675
3. Unfunded Actuarial Accrued Liability (B.1 - B.2)			\$ 608,518
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE**			
1. Present Value of Future Payrolls Through the Amortization Date of June 30, 2048***			\$ 4,680,314
2. Supplemental Contribution Rate (B.3 / C.1)			13.00%

* 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, 2018 (dollars in thousands)

A. UAAL AT BEGINNING OF YEAR	\$	572,741
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING		
1. Normal Cost and Expenses	\$	25,873
2. Contributions	\$	(59,321)
3. Interest	\$	44,481
4. Total	<u>\$</u>	<u>11,033</u>
C. EXPECTED UAAL AT END OF YEAR (A + B.4)	\$	583,774
D. INCREASE / (DECREASE) DUE TO ACTUARIAL LOSSES / (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED		
1. Age and Service Retirements	\$	2,386
2. Disability Retirements		(57)
3. Death-in-Service Benefits		176
4. Withdrawals		(3,835)
5. Salary Increases		(14,984)
6. Investment Income		(5,179)
7. Mortality of Annuitants		(420)
8. Other Items		2,472
9. Total	<u>\$</u>	<u>(19,441)</u>
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C + D.9)	\$	564,333
F. CHANGE IN UAAL DUE TO PLAN AMENDMENTS		(74,376)
G. CHANGE IN UAAL DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS		118,561
H. UAAL AT END OF YEAR (E + F + G)	<u>\$</u>	<u>608,518</u>

Determination of Contribution Sufficiency as of July 1, 2018 (dollars in thousands)

	Percent-of- Payroll	Dollar Amount
A. STATUTORY CONTRIBUTIONS - CHAPTER 354A		
1. Employee Contributions	7.50%	\$ 21,138
2. Employer Contributions		
a. Regular	7.34%	20,688
b. Additional	3.84%	10,820
3. Supplemental Contribution		
a. 1996 Legislation	0.30%	838
b. 1997 Legislation	1.00%	2,827
c. 2014 Legislation	2.48%	7,000
d. 2018 Legislation	1.77%	5,000
4. Total	24.23%	\$ 68,311
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	5.44%	\$ 15,330
b. Disability Benefits	0.18%	508
c. Surviving Spouse and Child Benefits	0.07%	197
d. Vested Withdrawals	1.90%	5,355
e. Refund Liability Due to Death or Withdrawal	0.67%	1,889
f. Total	8.26%	\$ 23,279
2. Supplemental Contribution Amortization	13.00%	36,632
3. Allowance for Administrative Expenses	0.28%	789
4. Total	21.54%	\$ 60,700
C. CONTRIBUTION SUFFICIENCY / (DEFICIENCY) (A.4 - B.4)	2.69%	7,611
Projected Annual Payroll for Fiscal Year Beginning on the Valuation Date (determined according to requirements of the LCPR Standards for Actuarial Work):		\$ 281,782

Actuarial Methods and Assumptions as of July 1, 2018

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 reflected in this report 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-2017 from 2006
 - b. Female: RP-2014 Healthy Annuitant Mortality Table for females adjusted for white collar and projected with Scale MP-2017 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-2017 from 2006
 - b. Female: RP-2014 Employee Mortality Table for females adjusted for white collar and projected with Scale MP-2017 from 2006

Actuarial Methods and Assumptions as of July 1, 2018

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

Age in 2018	Post-Retirement Mortality	
	Male	Female
55	40	25
56	42	27
57	45	29
58	48	31
59	51	33
60	55	35
61	59	38
62	64	41
63	69	46
64	74	51
65	81	56
66	88	62
67	96	67
68	105	74
69	116	81
70	128	89
71	142	98
72	158	108
73	176	120
74	197	133
75	220	148
76	246	165
77	275	184
78	309	205
79	347	230
80	390	258
81	440	289
82	497	325
83	563	367
84	638	414

Actuarial Methods and Assumptions as of July 1, 2018

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

Age in 2018	Pre-Retirement Mortality	
	Male	Female
30	4	2
31	4	2
32	4	2
33	4	2
34	4	3
35	4	3
36	4	3
37	4	3
38	5	3
39	5	4
40	5	4
41	5	4
42	5	4
43	6	5
44	6	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	16
57	25	18
58	27	20
59	31	21

Actuarial Methods and Assumptions as of July 1, 2018

Rates of Disability:

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

Age	Disability	Age	Disability
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, 2018

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, 2018

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

Actuarial Methods and Assumptions as of July 1, 2018

	children.
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.
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, 2018

Supplemental Contributions:	<p>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.</p> <p>The contributions described herein will continue until the plan is 100% funded or until June 30, 2048, whichever occurs earlier.</p>
Projected Annual Payroll Calculation:	<p>The census data as of July 1, 2018 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; and the Projected Annual Payroll for the fiscal year ending June 30, 2019 includes this replacement salary amount.</p>
Changes in Actuarial Methods and Assumptions Since the Prior Valuation:	<p>The assumed investment return was lowered from 8.0% to 7.5%.</p> <p>Assumed wage inflation decreased from 4.0% to 3.0%.</p> <p>Salary increase rates were updated from an age-based table with a service-based component during the first fifteen years, to a service based table of rates.</p> <p>Retirement, withdrawal, and disability rates were adjusted to better fit observed experience.</p> <p>The mortality table was updated from the RP-2000 Mortality Table (with adjustments) projected with Scale AA to 2020, to the RP-2014 Mortality Table, with white collar adjustment, set back 2 years for females, projected with Scale MP-2017 from 2006.</p> <p>The statutory amortization period was changed from June 30, 2042 to June 30, 2048.</p>

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>, on January 22, 2019.

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

FOR THE YEAR ENDED JUNE 30, 2018

St. Paul Teachers' Retirement Fund Association
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