ACTUARIAL SECTION

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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.

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 — James D. Anderson

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) - Net Investment Income] / 2}	$ 1,003,468
	{Net investment income: B.5+B.6+B.7+B.9}	
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	$	936,501
C.	TOTAL CURRENT AND EXPECTED FUTURE ASSETS	$	2,004,176
D.	TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS	$	1,869,580
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	$	11,033
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	$	(19,441)
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)	$	608,518

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	Post-Retirement Mortality 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	Pre-Retirement Mortality	
2018	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:	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. The contributions described herein will continue until the plan is 100% funded or until June 30, 2048, whichever occurs earlier.
Projected Annual Payroll Calculation:	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.
Changes in Actuarial Methods and Assumptions Since the Prior Valuation:	The assumed investment return was lowered from 8.0% to 7.5%. Assumed wage inflation decreased from 4.0% to 3.0%. 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. Retirement, withdrawal, and disability rates were adjusted to better fit observed experience. 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. The statutory amortization period was changed from June 30, 2042 to June 30, 2048.

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
1619 Dayton Avenue, Room 309
St. Paul, MN 55104-6206