

February 4, 2019

CONFIDENTIAL

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

Re: Projection of Contributions and Funding Status – SPTRFA

Dear Jill:

Attached are 30-year projections of estimated funded status, required contributions, and statutory contributions under three asset return scenarios for the St. Paul Teachers' Retirement Fund Association (SPTRFA). These projections, including the underlying investment return assumptions, are required by the Minnesota Standards for Actuarial Work. Unless noted otherwise, the estimates are based on participant data, assumptions, methods, and plan provisions as detailed in the SPTRFA Actuarial Valuation Report for funding purposes as of July 1, 2018.

Basis for Projections

For all enclosed projections, liabilities are determined using the statutory investment return assumption of 7.5%. As required by the Minnesota Standards for Actuarial Work, the projections reflect three asset return scenarios (7.5%, 6.0% and 9.0%). Note that we believe the 9.0% rate of return assumption is outside of the range of reasonable expected returns for this plan.

The estimates are based on the actuarial value of assets with five year smoothing of investment gains or losses.

Payroll is assumed to increase approximately 3.0% per year over the long-term, consistent with the valuation assumption for total payroll growth.

The projection is an open group projection; meaning, active members projected to retire or otherwise terminate in the future are replaced with new active members so that the total active membership of the fund remains at 3,577 members. The profile of these new members is the same as new members hired between July 1, 2012 and July 1, 2017:

- Average age at hire is 34.4
- Average salary at hire is \$53,600
- Approximately 76% female, 24% male

If actuarial accrued liability exceeds assets, the unfunded actuarial accrued liability is amortized through June 30, 2048 per Minnesota Statute 356.215, Subdivision 11. Per Minnesota Statute 356.215, Subdivision 11 (l), a negative unfunded actuarial accrued liability (i.e., when assets exceed liability) is amortized over a rolling 30-year period.

Annual supplemental contributions of \$15.665 million are assumed to continue until the earlier of 100% funding on an actuarial value of assets basis or June 30, 2048. The supplemental contributions are projected to be eliminated in fiscal years ending 2033, 2040, and 2049 in the 9.0%, 7.5%, and 6.0% investment return scenarios, respectively.

Comments

The reader should keep the following in mind when reviewing these results:

- Investment experience that has occurred since the measurement date is not reflected in this report.
- The enclosed projections are based on assumptions as outlined in the SPTRFA actuarial funding valuation as of July 1, 2018. Please see that report for comments regarding the 7.5% statutory investment return assumption, and sensitivity test results based on alternate assumptions.
- Actual payroll growth has consistently fallen short of the 3.0% assumption; average growth over the last ten years was 1.1%. If actual payroll growth over the projection period is less than 3.0% per year, contributions to pay the unfunded actuarial accrued liability must increase over time to make up for the assumption not being met.
- Note that plan changes reflected in the July 1, 2018 valuation report may result in behavior changes that are not anticipated in the current assumptions.
- In the 7.5% and 9.0% investment return scenarios, surplus assets reduce the projected required contributions to amounts less than normal cost, and eventually to zero. We would typically recommend the contribution be at least equal to the normal cost of the plan.

Disclosures

To the best of our knowledge and belief, the calculations were completed in accordance with the requirements of Minnesota Statutes, Section 356.215, and the requirements of the Standards for Actuarial Work established by the Legislative Commission on Pensions and Retirement.

This report should not be relied upon for any purpose other than the purpose described herein. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results. GRS is not responsible for the consequences of any unauthorized use.



The valuation was based upon data and information through June 30, 2018 furnished by the SPTRFA staff concerning Retirement Fund benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. 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 SPTRFA.

The contribution rates shown in this report have been determined using the actuarial assumptions and methods disclosed in Section 4 of the July 1, 2018 valuation report. This valuation 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.

The projections 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.

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 the valuation report. SPTRFA is solely responsible for communicating to GRS any changes required thereto.

The 2018 experience study concluded that the current 7.5% assumption is within a reasonable range. However, in any given year it is less than 50% likely that this return will be achieved. The statutory requirement for projections that are 1.5% above and 1.5% below the assumed rate may give the reader the impression that the 7.5% projection is a precise (middle of the road) representation of the expected future results. We caution against making funding decisions without full consideration of the median results.

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.



Professional Qualifications

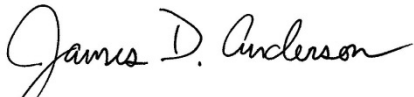
This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the St. Paul Teachers' Retirement Fund Association as of the valuation date and was performed in accordance with the requirements of Minnesota Statutes Section 356.215, and the requirements of the Standards for Actuarial Work established by the LCPR. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

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.

Sincerely,



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



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

BJW/JDA:sc
Enclosures



Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if there are no changes in benefits or contributions and all actuarial assumptions are met (including the assumption of the plan earning 7.5%), it is expected that:

- (1) The normal cost of the plan is expected to remain approximately level as a percent of pay,
- (2) The funded status of the plan is expected to gradually improve and is expected to be 100% funded within the next 30 years, and
- (3) The unfunded liability will grow initially as a dollar amount before beginning to decline.

Limitations of Funded Status Measurements

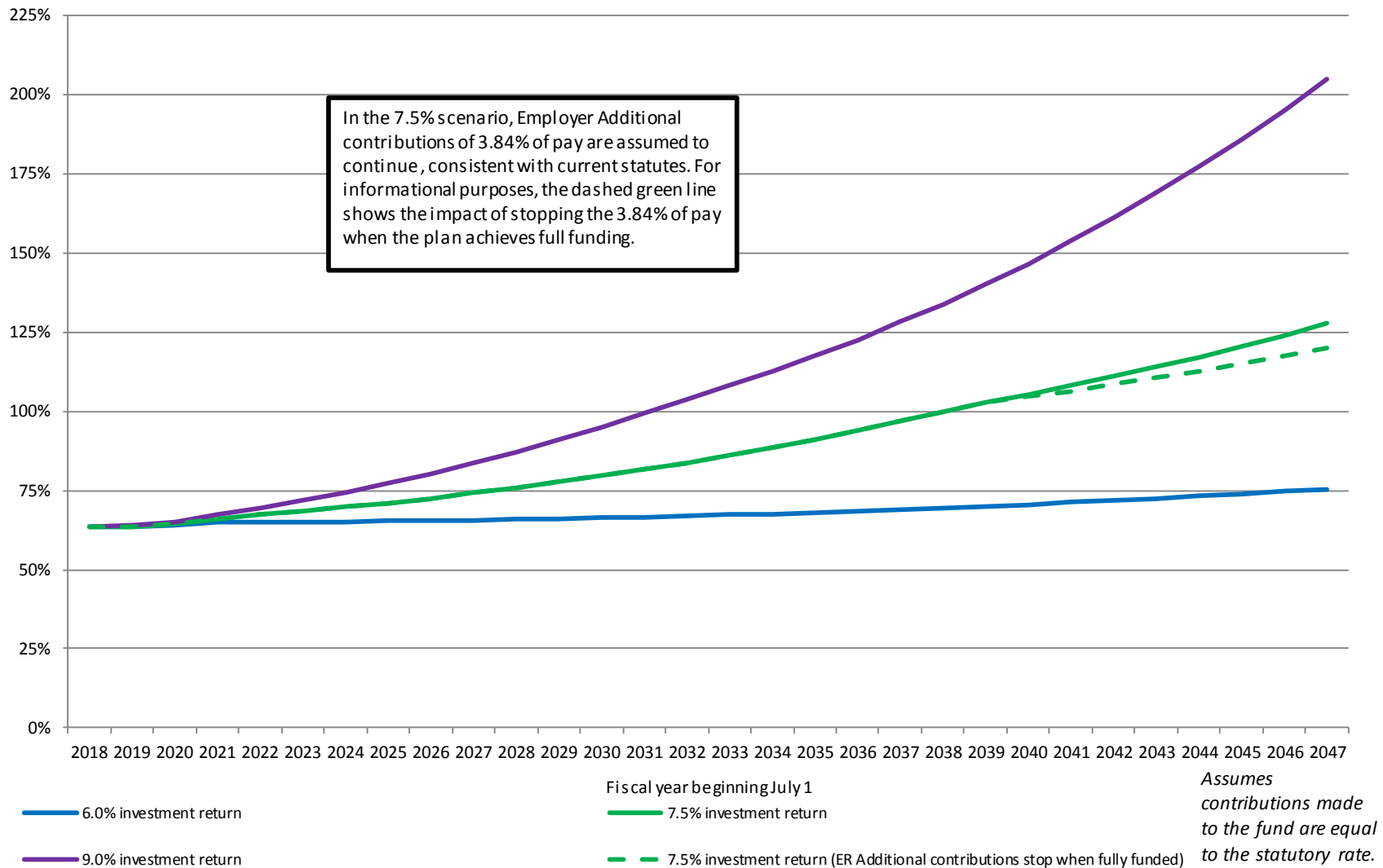
Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
- (2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- (3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets.

This exhibit should only be viewed in conjunction with GRS' January 31, 2019 letter.

St. Paul Teachers' Retirement Fund Association Estimated Funded Ratio

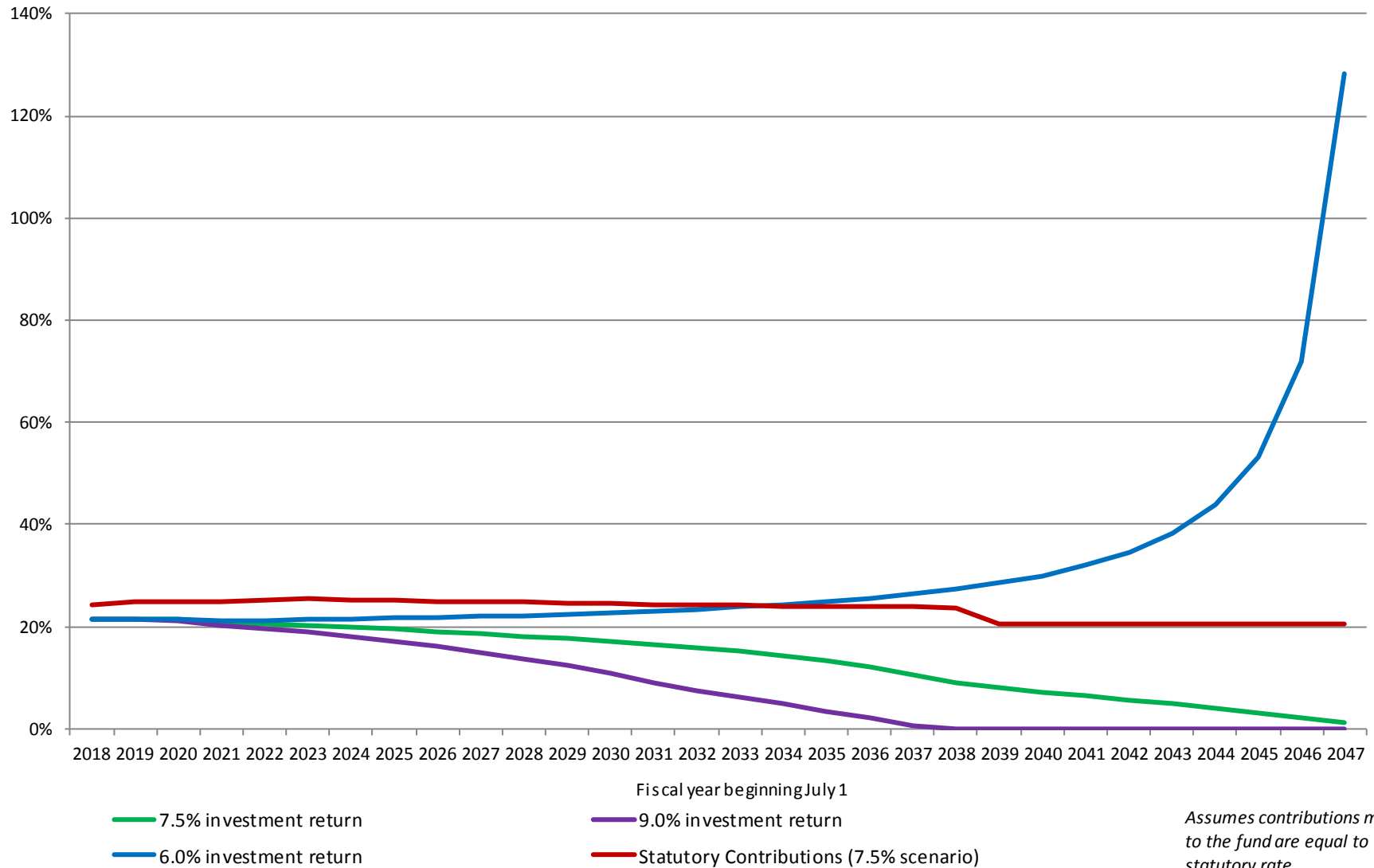
In all scenarios, the interest rate used to discount liabilities is 7.50%.



This exhibit should only be viewed in conjunction with GRS' January 31, 2019 letter.

St. Paul Teachers' Retirement Fund Association Estimated Required Contribution Rates (% of Pay)

In all scenarios, the interest rate used to discount liabilities is 7.50%.



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in conjunction with GRS' January 31,
2019 letter.

St. Paul Teachers' Retirement Fund Association

Scenario: 7.5% investment return for all years

Fiscal year beginning July 1

\$ in Thousands	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.2%	24.9%	24.9%	25.0%	25.3%	25.4%	25.3%	25.1%	25.0%	24.9%
Required - Chapter 356 (AVA)	21.5%	21.5%	21.3%	20.8%	20.5%	20.2%	19.8%	19.5%	19.1%	18.6%
Sufficiency / (Deficiency)	2.7%	3.3%	3.6%	4.2%	4.8%	5.2%	5.4%	5.7%	5.9%	6.2%
Contributions										
Statutory - Chapter 354A	68,311	72,623	74,906	77,232	80,408	82,904	84,831	86,833	88,904	91,038
Required - Chapter 356 (AVA)	60,700	62,891	64,108	64,277	65,032	65,871	66,606	67,263	67,816	68,237
Sufficiency / (Deficiency)	7,611	9,732	10,798	12,955	15,376	17,033	18,225	19,570	21,088	22,801
Funding Ratios										
Current Assets (AVA)	1,067,675	1,084,661	1,115,282	1,163,369	1,202,707	1,242,544	1,285,914	1,332,508	1,382,921	1,437,587
Actuarial Accrued Liability (AAL)	1,676,193	1,704,878	1,732,428	1,760,003	1,787,526	1,815,501	1,844,360	1,874,224	1,905,486	1,938,366
Unfunded AAL	608,518	620,217	617,146	596,634	584,819	572,957	558,447	541,716	522,565	500,779
Funding Ratio	63.7%	63.6%	64.4%	66.1%	67.3%	68.4%	69.7%	71.1%	72.6%	74.2%
Benefit Payments										
Ratio of Assets to Benefit Payments	116,343	120,349	123,029	125,785	128,064	130,010	131,938	133,601	135,189	136,784
	9.18	9.01	9.07	9.25	9.39	9.56	9.75	9.97	10.23	10.51

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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2019 letter.

St. Paul Teachers' Retirement Fund Association
Scenario: 7.5% investment return for all years
Fiscal year beginning July 1

\$ in Thousands	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.8%	24.6%	24.5%	24.4%	24.3%	24.2%	24.1%	24.0%	23.9%	23.8%
Required - Chapter 356 (AVA)	18.2%	17.7%	17.1%	16.5%	15.9%	15.1%	14.2%	13.2%	12.1%	10.7%
Sufficiency / (Deficiency)	6.6%	7.0%	7.4%	7.9%	8.5%	9.1%	9.9%	10.8%	11.9%	13.1%
Contributions										
Statutory - Chapter 354A	93,239	95,493	97,793	100,136	102,540	105,001	107,542	110,161	112,872	115,685
Required - Chapter 356 (AVA)	68,495	68,541	68,330	67,796	66,874	65,463	63,450	60,669	56,912	51,879
Sufficiency / (Deficiency)	24,745	26,953	29,463	32,340	35,666	39,538	44,093	49,491	55,961	63,806
Funding Ratios										
Current Assets (AVA)	1,496,881	1,561,213	1,630,956	1,706,179	1,787,230	1,874,216	1,967,628	2,068,053	2,175,944	2,291,823
Actuarial Accrued Liability (AAL)	1,973,016	2,009,603	2,048,240	2,088,735	2,131,140	2,175,239	2,221,173	2,269,139	2,319,171	2,371,329
Unfunded AAL	476,135	448,389	417,284	382,556	343,910	301,023	253,546	201,086	143,227	79,506
Funding Ratio	75.9%	77.7%	79.6%	81.7%	83.9%	86.2%	88.6%	91.1%	93.8%	96.7%
Benefit Payments										
Ratio of Assets to Benefit Payments	138,385	140,045	142,072	144,205	146,713	149,236	151,735	154,382	157,158	160,038
	10.82	11.15	11.48	11.83	12.18	12.56	12.97	13.40	13.85	14.32

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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St. Paul Teachers' Retirement Fund Association
Scenario: 7.5% investment return for all years
Fiscal year beginning July 1

\$ in Thousands	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Contributions (% of Payroll)										
Statutory - Chapter 354A	23.7%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%
Required - Chapter 356 (AVA)	9.0%	8.0%	7.3%	6.5%	5.7%	4.8%	4.0%	3.0%	2.1%	1.1%
Sufficiency / (Deficiency)	14.7%	12.6%	13.3%	14.1%	14.9%	15.8%	16.6%	17.6%	18.5%	19.5%
Contributions										
Statutory - Chapter 354A	118,603	105,976	109,124	112,382	115,748	119,220	122,808	126,523	130,363	134,329
Required - Chapter 356 (AVA)	45,151	41,264	38,561	35,482	31,991	28,052	23,627	18,676	13,149	6,997
Sufficiency / (Deficiency)	73,452	64,712	70,564	76,900	83,757	91,168	99,181	107,846	117,214	127,332
Funding Ratios										
Current Assets (AVA)	2,416,282	2,550,149	2,678,165	2,816,113	2,964,942	3,125,418	3,298,108	3,484,090	3,684,387	3,899,994
Actuarial Accrued Liability (AAL)	2,425,704	2,482,578	2,542,347	2,605,131	2,671,289	2,740,956	2,814,018	2,890,820	2,971,585	3,056,450
Unfunded AAL	9,422	(67,572)	(135,819)	(210,982)	(293,652)	(384,462)	(484,090)	(593,270)	(712,802)	(843,544)
Funding Ratio	99.6%	102.7%	105.3%	108.1%	111.0%	114.0%	117.2%	120.5%	124.0%	127.6%
Benefit Payments										
Ratio of Assets to Benefit Payments	162,846	165,494	168,281	170,979	173,831	177,085	180,295	183,607	187,118	190,906
	14.84	15.41	15.91	16.47	17.06	17.65	18.29	18.98	19.69	20.43

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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2019 letter.

St. Paul Teachers' Retirement Fund Association
Scenario: 6.0% investment return for all years
Fiscal year beginning July 1

\$ in Thousands	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.2%	24.9%	24.9%	25.0%	25.3%	25.4%	25.3%	25.1%	25.0%	24.9%
Required - Chapter 356 (AVA)	21.5%	21.6%	21.6%	21.3%	21.3%	21.4%	21.5%	21.7%	21.8%	22.0%
Sufficiency / (Deficiency)	2.7%	3.3%	3.4%	3.7%	4.0%	4.0%	3.7%	3.5%	3.2%	2.9%
Contributions										
Statutory - Chapter 354A	68,311	72,623	74,906	77,232	80,408	82,904	84,831	86,833	88,904	91,038
Required - Chapter 356 (AVA)	60,700	63,083	64,771	65,716	67,581	69,900	72,316	74,883	77,614	80,524
Sufficiency / (Deficiency)	7,611	9,540	10,135	11,516	12,827	13,003	12,515	11,950	11,290	10,514
Funding Ratios										
Current Assets (AVA)	1,067,675	1,081,522	1,104,648	1,140,732	1,163,402	1,181,735	1,201,717	1,222,879	1,245,641	1,270,246
Actuarial Accrued Liability (AAL)	1,676,193	1,704,878	1,732,428	1,760,003	1,787,526	1,815,501	1,844,360	1,874,224	1,905,486	1,938,366
Unfunded AAL	608,518	623,356	627,781	619,271	624,124	633,766	642,644	651,345	659,846	668,120
Funding Ratio	63.7%	63.4%	63.8%	64.8%	65.1%	65.1%	65.2%	65.3%	65.4%	65.5%
Benefit Payments										
Ratio of Assets to Benefit Payments	9.18	8.99	8.98	9.07	9.08	9.09	9.11	9.15	9.21	9.29

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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2019 letter.

St. Paul Teachers' Retirement Fund Association
Scenario: 6.0% investment return for all years
Fiscal year beginning July 1

\$ in Thousands	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.8%	24.6%	24.5%	24.4%	24.3%	24.2%	24.1%	24.0%	23.9%	23.8%
Required - Chapter 356 (AVA)	22.2%	22.4%	22.7%	23.0%	23.4%	23.8%	24.3%	24.9%	25.5%	26.3%
Sufficiency / (Deficiency)	2.6%	2.2%	1.8%	1.4%	0.9%	0.4%	(0.2)%	(0.9)%	(1.6)%	(2.5)%
Contributions										
Statutory - Chapter 354A	93,239	95,493	97,793	100,136	102,540	105,001	107,542	110,161	112,872	115,685
Required - Chapter 356 (AVA)	83,636	86,966	90,550	94,420	98,635	103,256	108,370	114,081	120,536	127,925
Sufficiency / (Deficiency)	9,603	8,527	7,243	5,716	3,904	1,745	(828)	(3,921)	(7,664)	(12,240)
Funding Ratios										
Current Assets (AVA)	1,296,863	1,325,678	1,356,819	1,390,091	1,425,554	1,463,010	1,502,616	1,544,605	1,589,047	1,636,049
Actuarial Accrued Liability (AAL)	1,973,016	2,009,603	2,048,240	2,088,735	2,131,140	2,175,239	2,221,173	2,269,139	2,319,171	2,371,329
Unfunded AAL	676,153	683,924	691,421	698,645	705,586	712,230	718,558	724,534	730,124	735,280
Funding Ratio	65.7%	66.0%	66.2%	66.6%	66.9%	67.3%	67.7%	68.1%	68.5%	69.0%
Benefit Payments										
Ratio of Assets to Benefit Payments	138,385	140,045	142,072	144,205	146,713	149,236	151,735	154,382	157,158	160,038
	9.37	9.47	9.55	9.64	9.72	9.80	9.90	10.01	10.11	10.22

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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2019 letter.

St. Paul Teachers' Retirement Fund Association
Scenario: 6.0% investment return for all years
Fiscal year beginning July 1

\$ in Thousands	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Contributions (% of Payroll)										
Statutory - Chapter 354A	23.7%	23.6%	23.6%	23.5%	23.4%	23.3%	23.2%	23.1%	23.1%	23.0%
Required - Chapter 356 (AVA)	27.3%	28.5%	30.0%	32.0%	34.6%	38.3%	43.8%	53.2%	71.9%	128.1%
Sufficiency / (Deficiency)	(3.6)%	(4.9)%	(6.5)%	(8.5)%	(11.2)%	(15.0)%	(20.6)%	(30.0)%	(48.8)%	(105.1)%
Contributions										
Statutory - Chapter 354A	118,603	121,641	124,789	128,047	131,413	134,885	138,473	142,188	146,028	149,994
Required - Chapter 356 (AVA)	136,512	146,683	159,012	174,394	194,332	221,529	261,401	326,576	454,919	835,781
Sufficiency / (Deficiency)	(17,908)	(25,042)	(34,222)	(46,347)	(62,918)	(86,644)	(122,928)	(184,388)	(308,891)	(685,787)
Funding Ratios										
Current Assets (AVA)	1,685,760	1,738,526	1,794,817	1,854,819	1,918,962	1,987,447	2,060,230	2,137,728	2,220,249	2,308,016
Actuarial Accrued Liability (AAL)	2,425,704	2,482,578	2,542,347	2,605,131	2,671,289	2,740,956	2,814,018	2,890,820	2,971,585	3,056,450
Unfunded AAL	739,943	744,052	747,530	750,312	752,328	753,509	753,788	753,092	751,336	748,434
Funding Ratio	69.5%	70.0%	70.6%	71.2%	71.8%	72.5%	73.2%	74.0%	74.7%	75.5%
Benefit Payments										
Ratio of Assets to Benefit Payments	162,846	165,494	168,281	170,979	173,831	177,085	180,295	183,607	187,118	190,906
	10.35	10.51	10.67	10.85	11.04	11.22	11.43	11.64	11.87	12.09

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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St. Paul Teachers' Retirement Fund Association
Scenario: 9.0% investment return for all years
Fiscal year beginning July 1

\$ in Thousands	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.2%	24.9%	24.9%	25.0%	25.3%	25.4%	25.3%	25.1%	25.0%	24.9%
Required - Chapter 356 (AVA)	21.5%	21.5%	21.1%	20.3%	19.7%	18.9%	18.0%	17.1%	16.1%	15.0%
Sufficiency / (Deficiency)	2.7%	3.4%	3.8%	4.7%	5.7%	6.5%	7.2%	8.0%	8.9%	9.9%
Contributions										
Statutory - Chapter 354A	68,311	72,623	74,906	77,232	80,408	82,904	84,831	86,833	88,904	91,038
Required - Chapter 356 (AVA)	60,700	62,699	63,439	62,812	62,409	61,681	60,594	59,129	57,208	54,739
Sufficiency / (Deficiency)	7,611	9,924	11,467	14,420	17,999	21,223	24,237	27,704	31,696	36,299
Funding Ratios										
Current Assets (AVA)	1,067,675	1,087,799	1,126,011	1,186,428	1,243,150	1,305,773	1,374,573	1,449,528	1,531,546	1,621,411
Actuarial Accrued Liability (AAL)	1,676,193	1,704,878	1,732,428	1,760,003	1,787,526	1,815,501	1,844,360	1,874,224	1,905,486	1,938,366
Unfunded AAL	608,518	617,079	606,417	573,575	544,375	509,728	469,787	424,696	373,941	316,955
Funding Ratio	63.7%	63.8%	65.0%	67.4%	69.6%	71.9%	74.5%	77.3%	80.4%	83.7%
Benefit Payments										
Ratio of Assets to Benefit Payments	116,343	120,349	123,029	125,785	128,064	130,010	131,938	133,601	135,189	136,784
	9.18	9.04	9.15	9.43	9.71	10.04	10.42	10.85	11.33	11.85

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

This exhibit should only be viewed
in conjunction with GRS' January 31,
2019 letter.

St. Paul Teachers' Retirement Fund Association
Scenario: 9.0% investment return for all years
Fiscal year beginning July 1

\$ in Thousands	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.8%	24.6%	24.5%	24.4%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%
Required - Chapter 356 (AVA)	13.7%	12.3%	10.7%	9.0%	7.5%	6.2%	4.9%	3.6%	2.1%	0.5%
Sufficiency / (Deficiency)	11.1%	12.3%	13.8%	15.5%	13.1%	14.4%	15.7%	17.0%	18.5%	20.1%
Contributions										
Statutory - Chapter 354A	93,239	95,493	97,793	100,136	86,875	89,336	91,877	94,496	97,207	100,020
Required - Chapter 356 (AVA)	51,613	47,686	42,794	36,724	31,565	27,089	22,012	16,273	9,814	2,565
Sufficiency / (Deficiency)	41,626	47,808	54,999	63,413	55,310	62,247	69,865	78,223	87,393	97,455
Funding Ratios										
Current Assets (AVA)	1,719,885	1,827,805	1,946,011	2,075,092	2,215,967	2,353,094	2,502,626	2,665,743	2,843,545	3,037,269
Actuarial Accrued Liability (AAL)	1,973,016	2,009,603	2,048,240	2,088,735	2,131,140	2,175,239	2,221,173	2,269,139	2,319,171	2,371,329
Unfunded AAL	253,131	181,798	102,229	13,643	(84,827)	(177,855)	(281,453)	(396,604)	(524,374)	(665,941)
Funding Ratio	87.2%	91.0%	95.0%	99.4%	104.0%	108.2%	112.7%	117.5%	122.6%	128.1%
Benefit Payments										
Ratio of Assets to Benefit Payments	138,385	140,045	142,072	144,205	146,713	149,236	151,735	154,382	157,158	160,038
	12.43	13.05	13.70	14.39	15.10	15.77	16.49	17.27	18.09	18.98

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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St. Paul Teachers' Retirement Fund Association
Scenario: 9.0% investment return for all years
Fiscal year beginning July 1

\$ in Thousands	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Contributions (% of Payroll)										
Statutory - Chapter 354A	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%
Required - Chapter 356 (AVA)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sufficiency / (Deficiency)	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%
Contributions										
Statutory - Chapter 354A	102,938	105,976	109,124	112,382	115,748	119,220	122,808	126,523	130,363	134,329
Required - Chapter 356 (AVA)	0	0	0	0	0	0	0	0	0	0
Sufficiency / (Deficiency)	102,938	105,976	109,124	112,382	115,748	119,220	122,808	126,523	130,363	134,329
Funding Ratios										
Current Assets (AVA)	3,248,320	3,478,442	3,729,637	4,003,767	4,303,097	4,629,845	4,986,166	5,374,891	5,798,958	6,261,473
Actuarial Accrued Liability (AAL)	2,425,704	2,482,578	2,542,347	2,605,131	2,671,289	2,740,956	2,814,018	2,890,820	2,971,585	3,056,450
Unfunded AAL	(822,617)	(995,864)	(1,187,290)	(1,398,635)	(1,631,808)	(1,888,889)	(2,172,148)	(2,484,070)	(2,827,374)	(3,205,023)
Funding Ratio	133.9%	140.1%	146.7%	153.7%	161.1%	168.9%	177.2%	185.9%	195.2%	204.9%
Benefit Payments										
Ratio of Assets to Benefit Payments	162,846	165,494	168,281	170,979	173,831	177,085	180,295	183,607	187,118	190,906
	19.95	21.02	22.16	23.42	24.75	26.14	27.66	29.27	30.99	32.80

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.