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January 29, 2021

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

Re: Projection of Contributions and Funding Status

Dear Ms. Schurtz:

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, 2020.

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 3,445 members. The profile of these new members is the same as new members hired between July 1, 2014 and June 30, 2019:

- Average age at hire is 34.3
- Average salary at hire is $55,500
- 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 2036, 2044, 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:

- Statutory contributions are defined in statutes as a fixed percentage of payroll plus any supplemental contributions and represent the amount that is actually contributed to the plan. Required contributions are defined in statutes and the LCPR Standard for Actuarial Work and represent the amount needed to fully fund the plan by June 30, 2048 (normal cost, expenses and a payment to amortize the unfunded liability).

- 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, 2020. Please see that report for 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 1.4%. 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 makeup for the assumption not being met.

- Note that plan changes may result in behavior changes that are not anticipated in the current assumptions.

- 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 exceeded. 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 adjusting contribution rates without full consideration of the median results.

- In the 7.5% and 9.0% investment return scenarios, surplus assets reduce the projected required contributions to amounts less than normal cost. We typically recommend the contribution be at least equal to the normal cost of the plan and suggest that plans with considerable surplus assets investigate the pros and cons of reducing the risk of the plan's investment allocation to preserve surplus assets.

Disclosures

The purpose of this report is to estimate the Fund's funding progress and required contribution rates over a 30-year period according to prescribed assumptions and the Minnesota Standards for Actuarial Work. 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, 2020 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, 2020 valuation report. That valuation report includes risk metrics on page 10 but does not include a robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

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

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 was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

This report does not fully reflect the recent and still developing impact of COVID-19, which is likely to influence demographic and investment experience, at least in the short term. We will continue to monitor these developments and their impact on the plan.

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, James D. Anderson and Sheryl L. Christensen are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

Sincerely,

Bonita J. Wurst

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

James D. Anderson

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

Sheryl Christensen

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

BJW/JDA/SLC:ah

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 28 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.

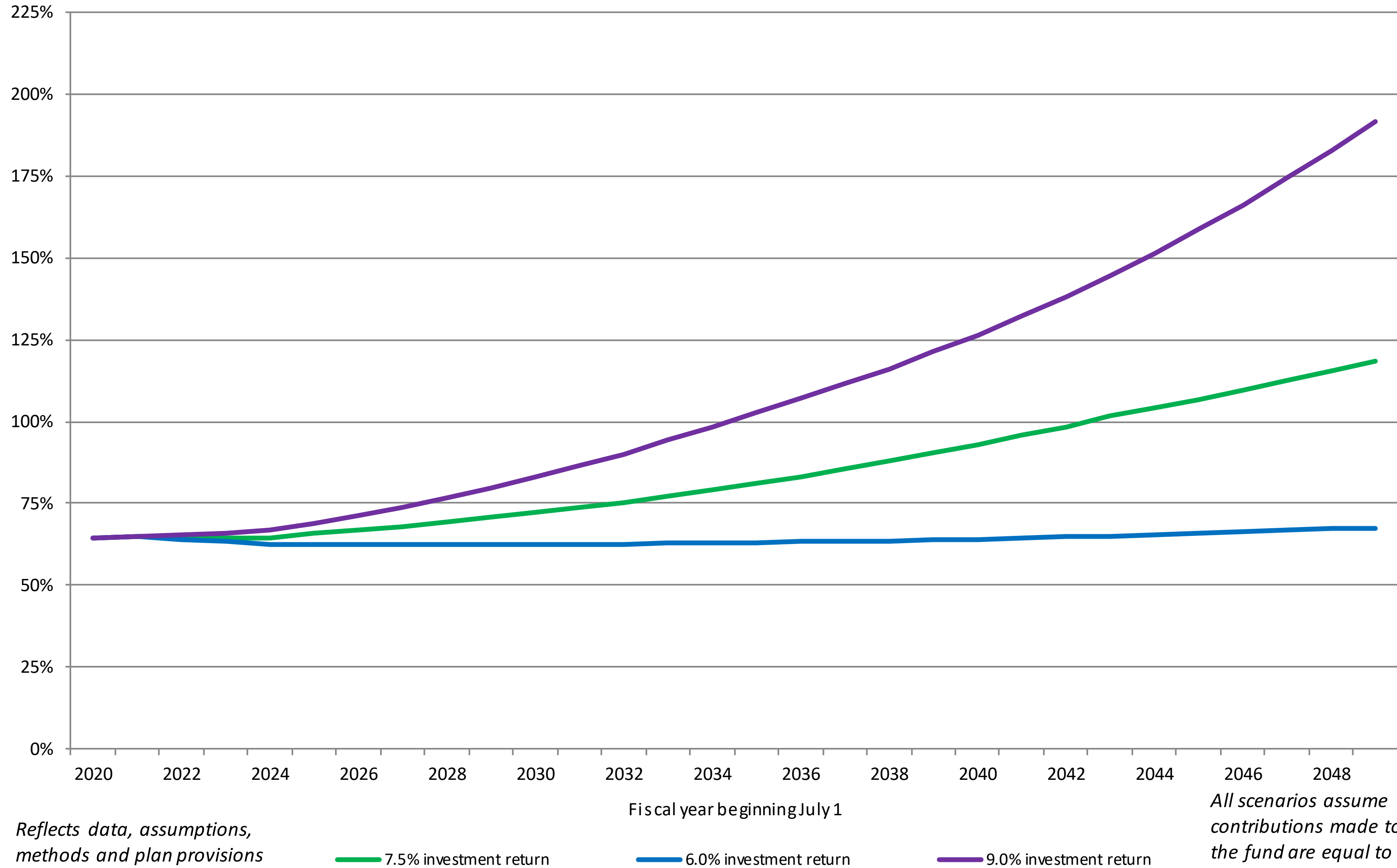
Limitations of Project Scope

Actuarial standards to not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

This exhibit should only be viewed in conjunction with GRS' January 29, 2021 letter.

St. Paul Teachers' Retirement Fund Association
Estimated Funded Ratio

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



Reflects data, assumptions, methods and plan provisions as of July1, 2020.

All scenarios assume contributions made to the fund are equal to the statutory rate.

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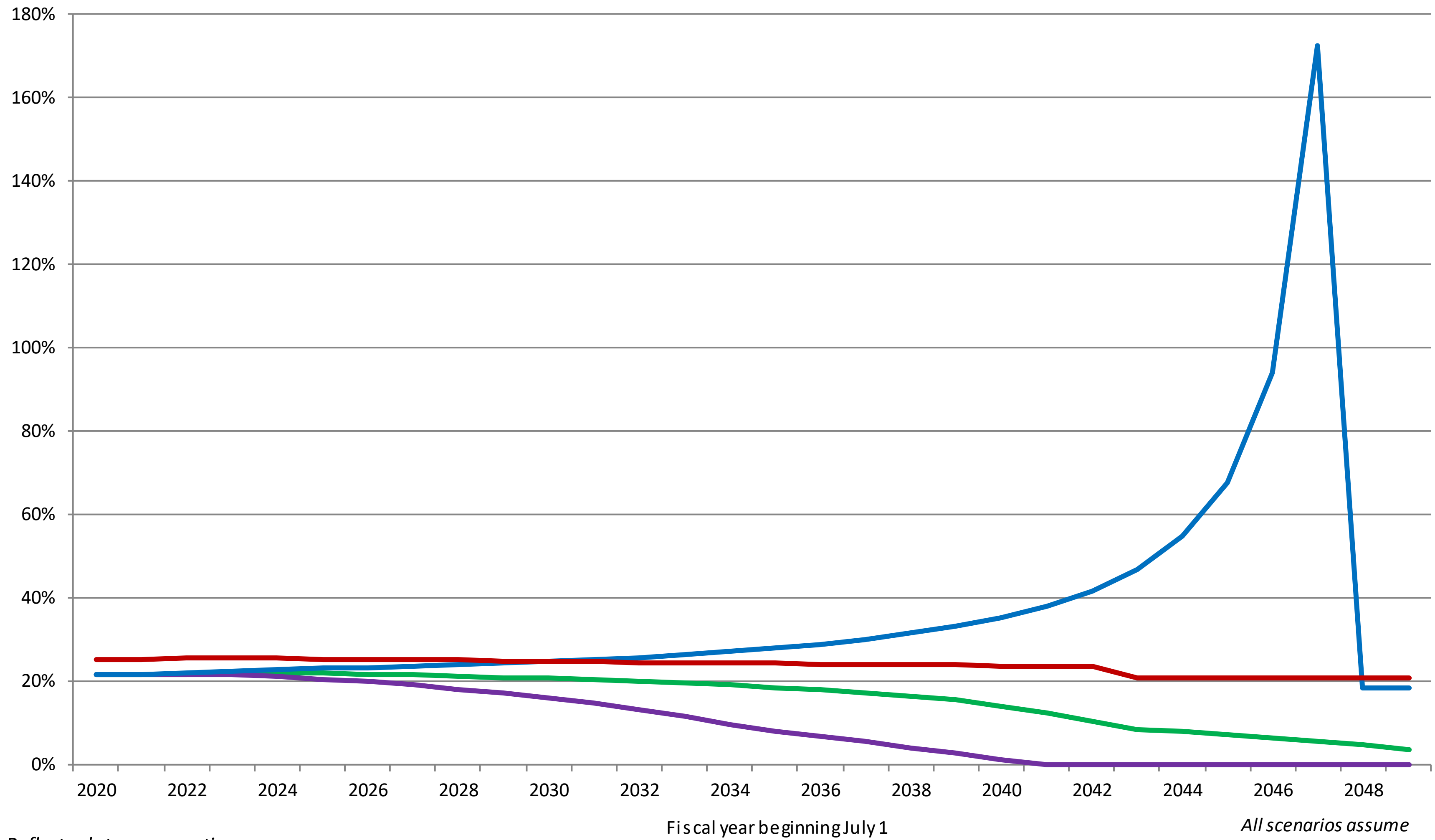
St. Paul Teachers' Retirement Fund Association
Estimated Required Contribution Rates (% of Pay)

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



Reflects data, assumptions, methods and plan provisions as of July1, 2020.

All scenarios assume contributions made to the fund are equal to the statutory rate.

This exhibit should only be viewed in conjunction with GRS' January 29, 2021 letter.

St. Paul Teachers' Retirement Fund Association

Scenario: 7.5% investment return for all years

Fiscal year beginning July 1

$ in Thousands	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Contributions (% of Payroll)										
Statutory - Chapter 354A	25.16%	25.22%	25.54%	25.60%	25.47%	25.33%	25.21%	25.08%	24.96%	24.84%
Required - Chapter 356 (AVA)	21.58%	21.52%	21.70%	21.91%	22.02%	21.81%	21.59%	21.35%	21.10%	20.83%
Sufficiency / (Deficiency)	3.58%	3.70%	3.84%	3.69%	3.45%	3.52%	3.62%	3.73%	3.86%	4.01%
Contributions										
Statutory - Chapter 354A	72,361	74,686	77,715	80,048	81,824	83,649	85,535	87,481	89,488	91,543
Required - Chapter 356 (AVA)	62,043	63,716	66,033	68,516	70,760	72,018	73,263	74,484	75,661	76,772
Sufficiency / (Deficiency)	10,318	10,970	11,682	11,533	11,064	11,631	12,272	12,998	13,827	14,771
Funding Ratios										
Current Assets (AVA)	1,090,243	1,115,393	1,129,852	1,143,674	1,163,761	1,200,767	1,240,482	1,283,396	1,330,090	1,380,721
Actuarial Accrued Liability (AAL)	1,691,236	1,719,650	1,746,491	1,773,226	1,800,543	1,828,495	1,857,426	1,887,671	1,919,650	1,953,338
Unfunded AAL	600,993	604,256	616,639	629,552	636,782	627,728	616,944	604,275	589,560	572,617
Funding Ratio	64.5%	64.9%	64.7%	64.5%	64.6%	65.7%	66.8%	68.0%	69.3%	70.7%
Benefit Payments	118,103	122,397	125,154	127,258	129,382	131,248	132,896	134,274	135,835	137,471
Ratio of Assets to Benefit Payments	9.23	9.11	9.03	8.99	8.99	9.15	9.33	9.56	9.79	10.04

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 29, 2021 letter.

St. Paul Teachers' Retirement Fund Association

Scenario: 7.5% investment return for all years

Fiscal year beginning July 1

$ in Thousands	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.73%	24.62%	24.51%	24.40%	24.30%	24.20%	24.10%	24.01%	23.91%	23.82%
Required - Chapter 356 (AVA)	20.54%	20.23%	19.88%	19.49%	19.04%	18.53%	17.94%	17.24%	16.41%	15.39%
Sufficiency / (Deficiency)	4.19%	4.39%	4.63%	4.91%	5.26%	5.67%	6.16%	6.77%	7.50%	8.43%
Contributions										
Statutory - Chapter 354A	93,644	95,790	97,996	100,256	102,590	104,993	107,483	110,062	112,737	115,520
Required - Chapter 356 (AVA)	77,801	78,712	79,481	80,058	80,392	80,408	80,009	79,057	77,356	74,626
Sufficiency / (Deficiency)	15,844	17,078	18,515	20,198	22,198	24,586	27,474	31,005	35,380	40,894
Funding Ratios										
Current Assets (AVA)	1,435,554	1,494,649	1,558,216	1,626,305	1,699,292	1,777,676	1,861,767	1,952,011	2,048,858	2,152,970
Actuarial Accrued Liability (AAL)	1,988,814	2,025,946	2,064,728	2,104,970	2,146,790	2,190,398	2,235,792	2,283,075	2,332,319	2,383,778
Unfunded AAL	553,260	531,297	506,512	478,665	447,499	412,722	374,025	331,064	283,461	230,807
Funding Ratio	72.2%	73.8%	75.5%	77.3%	79.2%	81.2%	83.3%	85.5%	87.9%	90.3%
Benefit Payments	139,400	141,478	143,891	146,321	148,697	151,234	153,837	156,541	159,178	161,648
Ratio of Assets to Benefit Payments	10.30	10.56	10.83	11.11	11.43	11.75	12.10	12.47	12.87	13.32

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	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Contributions (% of Payroll)										
Statutory - Chapter 354A	23.73%	23.64%	23.55%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%
Required - Chapter 356 (AVA)	14.12%	12.49%	10.32%	8.51%	7.79%	7.04%	6.25%	5.43%	4.57%	3.67%
Sufficiency / (Deficiency)	9.61%	11.15%	13.23%	12.08%	12.80%	13.55%	14.34%	15.16%	16.02%	16.92%
Contributions										
Statutory - Chapter 354A	118,403	121,384	124,468	111,987	115,281	118,688	122,219	125,867	129,646	133,561
Required - Chapter 356 (AVA)	70,441	64,124	54,556	46,310	43,634	40,577	37,105	33,180	28,764	23,812
Sufficiency / (Deficiency)	47,962	57,260	69,912	65,677	71,647	78,111	85,114	92,687	100,883	109,749
Funding Ratios										
Current Assets (AVA)	2,265,176	2,386,058	2,516,468	2,657,023	2,791,989	2,937,330	3,093,854	3,262,355	3,443,572	3,638,267
Actuarial Accrued Liability (AAL)	2,437,829	2,494,583	2,554,379	2,617,282	2,683,217	2,752,474	2,825,258	2,901,707	2,981,863	3,065,729
Unfunded AAL	172,653	108,525	37,911	(39,741)	(108,772)	(184,856)	(268,596)	(360,648)	(461,709)	(572,538)
Funding Ratio	92.9%	95.7%	98.5%	101.5%	104.1%	106.7%	109.5%	112.4%	115.5%	118.7%
Benefit Payments	164,241	166,737	169,426	172,451	175,456	178,544	181,798	185,321	189,158	192,968
Ratio of Assets to Benefit Payments	13.79	14.31	14.85	15.41	15.91	16.45	17.02	17.60	18.20	18.85

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 29, 2021 letter.

St. Paul Teachers' Retirement Fund Association

Scenario: 6.0% investment return for all years

Fiscal year beginning July 1

$ in Thousands	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Contributions (% of Payroll)										
Statutory - Chapter 354A	25.16%	25.22%	25.54%	25.60%	25.47%	25.33%	25.21%	25.08%	24.96%	24.84%
Required - Chapter 356 (AVA)	21.58%	21.58%	21.92%	22.38%	22.83%	23.05%	23.30%	23.59%	23.91%	24.27%
Sufficiency / (Deficiency)	3.58%	3.64%	3.62%	3.22%	2.64%	2.28%	1.91%	1.49%	1.05%	0.57%
Contributions										
Statutory - Chapter 354A	72,361	74,686	77,715	80,048	81,824	83,649	85,535	87,481	89,488	91,543
Required - Chapter 356 (AVA)	62,043	63,909	66,702	69,970	73,343	76,113	79,083	82,277	85,718	89,433
Sufficiency / (Deficiency)	10,318	10,777	11,013	10,079	8,481	7,536	6,452	5,205	3,771	2,110
Funding Ratios										
Current Assets (AVA)	1,090,243	1,112,350	1,119,542	1,121,732	1,125,673	1,141,855	1,158,937	1,177,261	1,197,246	1,218,871
Actuarial Accrued Liability (AAL)	1,691,236	1,719,650	1,746,491	1,773,226	1,800,543	1,828,495	1,857,426	1,887,671	1,919,650	1,953,338
Unfunded AAL	600,993	607,299	626,949	651,494	674,871	686,640	698,490	710,410	722,404	734,467
Funding Ratio	64.5%	64.7%	64.1%	63.3%	62.5%	62.5%	62.4%	62.4%	62.4%	62.4%
Benefit Payments	118,103	122,397	125,154	127,258	129,382	131,248	132,896	134,274	135,835	137,471
Ratio of Assets to Benefit Payments	9.23	9.09	8.95	8.81	8.70	8.70	8.72	8.77	8.81	8.87

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 29, 2021 letter.

St. Paul Teachers' Retirement Fund Association

Scenario: 6.0% investment return for all years

Fiscal year beginning July 1

$ in Thousands	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.73%	24.62%	24.51%	24.40%	24.30%	24.20%	24.10%	24.01%	23.91%	23.82%
Required - Chapter 356 (AVA)	24.68%	25.15%	25.69%	26.31%	27.02%	27.85%	28.83%	29.98%	31.37%	33.08%
Sufficiency / (Deficiency)	0.05%	(0.53)%	(1.18)%	(1.91)%	(2.72)%	(3.65)%	(4.73)%	(5.97)%	(7.46)%	(9.26)%
Contributions										
Statutory - Chapter 354A	93,644	95,790	97,996	100,256	102,590	104,993	107,483	110,062	112,737	115,520
Required - Chapter 356 (AVA)	93,472	97,878	102,725	108,088	114,080	120,836	128,544	137,452	147,906	160,410
Sufficiency / (Deficiency)	172	(2,088)	(4,729)	(7,832)	(11,490)	(15,842)	(21,061)	(27,390)	(35,169)	(44,890)
Funding Ratios										
Current Assets (AVA)	1,242,207	1,267,103	1,293,539	1,321,320	1,350,558	1,381,471	1,414,063	1,448,454	1,484,740	1,523,201
Actuarial Accrued Liability (AAL)	1,988,814	2,025,946	2,064,728	2,104,970	2,146,790	2,190,398	2,235,792	2,283,075	2,332,319	2,383,778
Unfunded AAL	746,607	758,843	771,189	783,650	796,232	808,927	821,729	834,621	847,579	860,577
Funding Ratio	62.5%	62.5%	62.7%	62.8%	62.9%	63.1%	63.3%	63.4%	63.7%	63.9%
Benefit Payments	139,400	141,478	143,891	146,321	148,697	151,234	153,837	156,541	159,178	161,648
Ratio of Assets to Benefit Payments	8.91	8.96	8.99	9.03	9.08	9.13	9.19	9.25	9.33	9.42

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: 6.0% investment return for all years

Fiscal year beginning July 1

$ in Thousands	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Contributions (% of Payroll)										
Statutory - Chapter 354A	23.73%	23.64%	23.55%	23.47%	23.39%	23.31%	23.23%	23.15%	20.59%	20.59%
Required - Chapter 356 (AVA)	35.22%	37.98%	41.68%	46.87%	54.69%	67.76%	93.95%	172.64%	18.30%	18.45%
Sufficiency / (Deficiency)	(11.49)%	(14.34)%	(18.13)%	(23.40)%	(31.30)%	(44.45)%	(70.72)%	(149.49)%	2.29%	2.14%
Contributions										
Statutory - Chapter 354A	118,403	121,384	124,468	127,652	130,946	134,353	137,884	141,532	129,646	133,561
Required - Chapter 356 (AVA)	175,716	194,997	220,222	254,935	306,221	390,609	557,682	1,055,341	115,230	119,665
Sufficiency / (Deficiency)	(57,313)	(73,613)	(95,754)	(127,283)	(175,276)	(256,257)	(419,799)	(913,809)	14,417	13,896
Funding Ratios										
Current Assets (AVA)	1,564,252	1,608,029	1,654,897	1,704,950	1,758,135	1,814,771	1,875,092	1,939,276	2,007,395	2,063,263
Actuarial Accrued Liability (AAL)	2,437,829	2,494,583	2,554,379	2,617,282	2,683,217	2,752,474	2,825,258	2,901,707	2,981,863	3,065,729
Unfunded AAL	873,577	886,555	899,482	912,332	925,082	937,703	950,166	962,431	974,468	1,002,466
Funding Ratio	64.2%	64.5%	64.8%	65.1%	65.5%	65.9%	66.4%	66.8%	67.3%	67.3%
Benefit Payments	164,241	166,737	169,426	172,451	175,456	178,544	181,798	185,321	189,158	192,968
Ratio of Assets to Benefit Payments	9.52	9.64	9.77	9.89	10.02	10.16	10.31	10.46	10.61	10.69

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	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Contributions (% of Payroll)										
Statutory - Chapter 354A	25.16%	25.22%	25.54%	25.60%	25.47%	25.33%	25.21%	25.08%	24.96%	24.84%
Required - Chapter 356 (AVA)	21.58%	21.45%	21.48%	21.44%	21.19%	20.52%	19.78%	18.97%	18.07%	17.06%
Sufficiency / (Deficiency)	3.58%	3.77%	4.06%	4.16%	4.28%	4.81%	5.43%	6.11%	6.89%	7.78%
Contributions										
Statutory - Chapter 354A	72,361	74,686	77,715	80,048	81,824	83,649	85,535	87,481	89,488	91,543
Required - Chapter 356 (AVA)	62,043	63,523	65,359	67,035	68,102	67,760	67,134	66,165	64,773	62,862
Sufficiency / (Deficiency)	10,318	11,163	12,356	13,014	13,721	15,889	18,401	21,317	24,715	28,681
Funding Ratios										
Current Assets (AVA)	1,090,243	1,118,436	1,140,254	1,166,024	1,202,953	1,262,026	1,326,353	1,396,691	1,473,922	1,558,533
Actuarial Accrued Liability (AAL)	1,691,236	1,719,650	1,746,491	1,773,226	1,800,543	1,828,495	1,857,426	1,887,671	1,919,650	1,953,338
Unfunded AAL	600,993	601,213	606,237	607,201	597,590	566,469	531,074	490,980	445,728	394,805
Funding Ratio	64.5%	65.0%	65.3%	65.8%	66.8%	69.0%	71.4%	74.0%	76.8%	79.8%
Benefit Payments	118,103	122,397	125,154	127,258	129,382	131,248	132,896	134,274	135,835	137,471
Ratio of Assets to Benefit Payments	9.23	9.14	9.11	9.16	9.30	9.62	9.98	10.40	10.85	11.34

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 29, 2021 letter.

St. Paul Teachers' Retirement Fund Association

Scenario: 9.0% investment return for all years

Fiscal year beginning July 1

$ in Thousands	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Contributions (% of Payroll)										
Statutory - Chapter 354A	24.73%	24.62%	24.51%	24.40%	24.30%	20.59%	20.59%	20.59%	20.59%	20.59%
Required - Chapter 356 (AVA)	15.93%	14.65%	13.19%	11.52%	9.58%	7.93%	6.72%	5.44%	4.08%	2.64%
Sufficiency / (Deficiency)	8.80%	9.97%	11.32%	12.88%	14.72%	12.66%	13.87%	15.15%	16.51%	17.95%
Contributions										
Statutory - Chapter 354A	93,644	95,790	97,996	100,256	102,590	89,328	91,818	94,397	97,072	99,855
Required - Chapter 356 (AVA)	60,326	57,015	52,761	47,332	40,441	34,403	29,965	24,926	19,226	12,803
Sufficiency / (Deficiency)	33,319	38,775	45,235	52,924	62,149	54,925	61,852	69,471	77,846	87,052
Funding Ratios										
Current Assets (AVA)	1,651,156	1,752,254	1,862,483	1,982,383	2,112,866	2,255,020	2,393,522	2,544,504	2,709,029	2,888,438
Actuarial Accrued Liability (AAL)	1,988,814	2,025,946	2,064,728	2,104,970	2,146,790	2,190,398	2,235,792	2,283,075	2,332,319	2,383,778
Unfunded AAL	337,659	273,693	202,245	122,587	33,924	(64,621)	(157,730)	(261,429)	(376,710)	(504,660)
Funding Ratio	83.0%	86.5%	90.2%	94.2%	98.4%	103.0%	107.1%	111.5%	116.2%	121.2%
Benefit Payments	139,400	141,478	143,891	146,321	148,697	151,234	153,837	156,541	159,178	161,648
Ratio of Assets to Benefit Payments	11.84	12.39	12.94	13.55	14.21	14.91	15.56	16.25	17.02	17.87

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 29, 2021 letter.

St. Paul Teachers' Retirement Fund Association

Scenario: 9.0% investment return for all years

Fiscal year beginning July 1

$ in Thousands	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Contributions (% of Payroll)										
Statutory - Chapter 354A	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%
Required - Chapter 356 (AVA)	1.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sufficiency / (Deficiency)	19.47%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%	20.59%
Contributions										
Statutory - Chapter 354A	102,738	105,719	108,803	111,987	115,281	118,688	122,219	125,867	129,646	133,561
Required - Chapter 356 (AVA)	5,588	-	-	-	-	-	-	-	-	-
Sufficiency / (Deficiency)	97,150	105,719	108,803	111,987	115,281	118,688	122,219	125,867	129,646	133,561
Funding Ratios										
Current Assets (AVA)	3,084,304	3,298,057	3,531,506	3,786,323	4,064,187	4,367,305	4,697,981	5,058,650	5,451,852	5,880,325
Actuarial Accrued Liability (AAL)	2,437,829	2,494,583	2,554,379	2,617,282	2,683,217	2,752,474	2,825,258	2,901,707	2,981,863	3,065,729
Unfunded AAL	(646,475)	(803,474)	(977,127)	(1,169,041)	(1,380,970)	(1,614,831)	(1,872,723)	(2,156,943)	(2,469,989)	(2,814,595)
Funding Ratio	126.5%	132.2%	138.3%	144.7%	151.5%	158.7%	166.3%	174.3%	182.8%	191.8%
Benefit Payments	164,241	166,737	169,426	172,451	175,456	178,544	181,798	185,321	189,158	192,968
Ratio of Assets to Benefit Payments	18.78	19.78	20.84	21.96	23.16	24.46	25.84	27.30	28.82	30.47

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.