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January 29, 2021

CONFIDENTIAL

Mr. Doug Anderson
Executive Director
Public Employees Retirement Association
of Minnesota
60 Empire Drive, Suite 200
St. Paul, MN 55103

Re: Projection of Contributions and Funding Status – General Plan

Dear Doug:

Attached are 30-year projections of estimated funded status, required contributions, and statutory contributions under three asset return scenarios for the General Employees Retirement Plan. 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, assets, and plan provisions as outlined in the General Employees Retirement Plan actuarial funding valuation 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 market value of assets with no smoothing of investment gains or losses. Payroll is assumed to increase approximately 3.00% 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 153,741 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 36.9
- Average salary at hire is $33,700
- Approximately 68% female, 32% males

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.

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Additional employer contributions of 1.0% of payroll expire when the plan reaches 100% funding (on an Actuarial Value basis). The additional employer contributions are projected to be eliminated in fiscal years ending 2031 and 2041 in the 9.0% and 7.5% investment return scenarios, respectively.

Actual benefit increases will equal one-half the Social Security Cost-of-Living Adjustment, not less than 1.00% and not more than 1.50%. The projections assume a constant post-retirement benefit increase of 1.25%. If actual benefit increases are greater than assumed, liabilities and required contributions will be greater than the amounts shown in the enclosed projections. More information about this assumption can be found in the valuation report as of July 1, 2020.

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 General Employees Retirement Plan actuarial funding valuation as of July 1, 2020. Please see that report for comments regarding the 7.5% statutory investment return assumption, and sensitivity test results based on alternate assumptions.

- Note that plan changes 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. 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.

- A 2019 analysis of long-term rate of investment return and inflation assumptions concluded that the probability of exceeding the current 7.5% assumption over 20 years is less than 50%. 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 an accurate (middle of the road) representation of the expected future results. Based on our modeling, the 7.5% scenario is optimistic and not representative of the expected (median) result. We caution against adjusting contribution rates without full consideration of the median results.

- Note that as funding ratios decline, as they are expected to in one of the investment return scenarios shown in this letter, it will be increasingly difficult for the plan to attain the assumed scenario investment return. Each year, a larger proportion of assets is paid out in benefits, and less capital is available to invest.

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.

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 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, except as noted. PERA is solely responsible for communicating to GRS any changes required thereto.

In a 2019 analysis of long-term rate of investment return and inflation assumptions, GRS determined that an investment return assumption of 7.5% was reasonable. Please see our experience study report dated June 27, 2019 for additional information. This report also concluded that the probability of exceeding the current 7.50% assumption over 10 years is 44%. If capital market assumptions decline from present levels, the 7.50% return assumption might not comply with the actuarial standards for the July 1, 2021 valuation. For informational purposes, results based on a 6.5% discount rate are shown on page 5 of the July 1, 2020 valuation report.

The contribution rates shown in this report have been determined using the actuarial assumptions and methods disclosed in the Actuarial Basis section of the July 1, 2020 valuation report. The valuation report includes risk metrics on page 9, 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 assume 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.

The valuation was based upon information furnished by the Public Employees Retirement Association of Minnesota (PERA), concerning 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 PERA.

This report was prepared using our proprietary valuation model and related software which, in our professional judgement, 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.

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.

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 General Employees Retirement Plan 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 Brian B. Murphy 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

Brian B. Murphy

Brian B. Murphy, FSA, EA, FCA, MAAA, PhD

BJW/BBM:ah
Enclosure

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% on the market value of assets), 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 market 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 actuarial value of assets were used instead of the market value of assets.

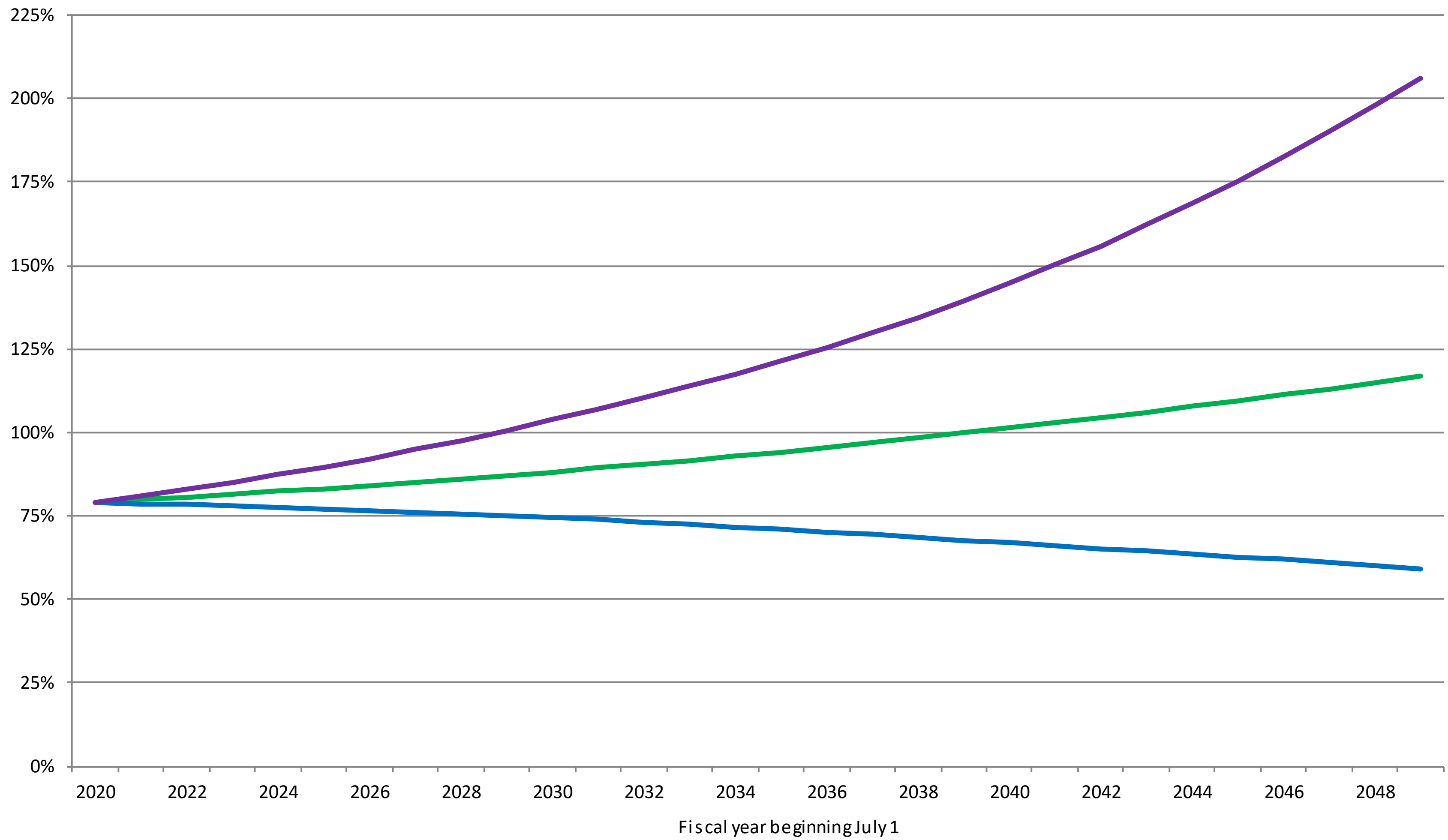
Limitations of Project Scope

Actuarial standards do 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 to PERA.

PERA General Employees Retirement Plan
Estimated Funded Ratio

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



Reflects data, assumptions, methods and plan provisions as of July 1, 2020.

7.5% investment return
6.0% investment return
9.0% investment return

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

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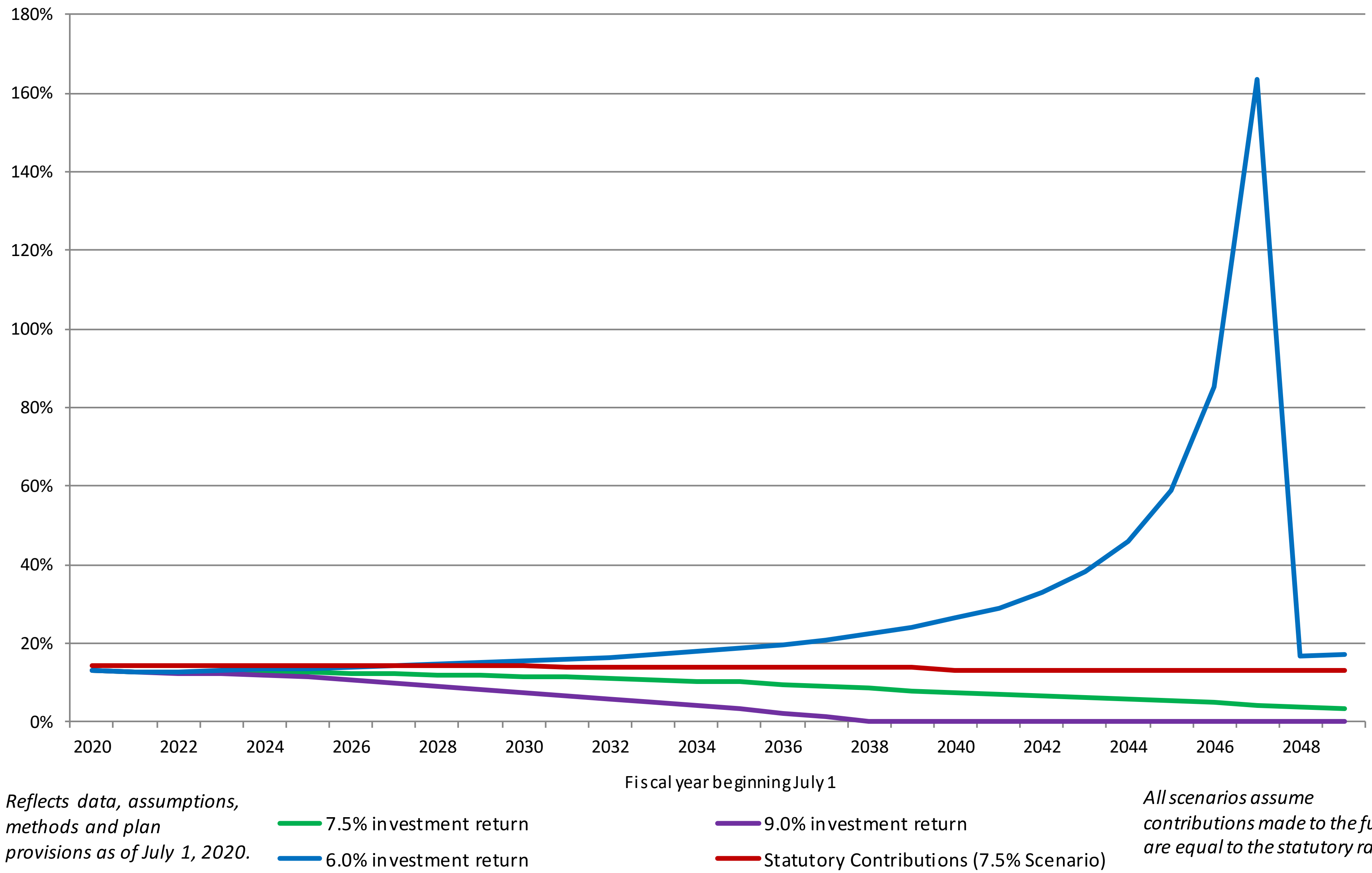
PERA General Employees Retirement Plan
Estimated Required Contribution Rates (% of Pay)

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



Reflects data, assumptions, methods and plan provisions as of July 1, 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 to PERA.

General Employees Retirement Plan

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 353	14.53%	14.52%	14.50%	14.49%	14.48%	14.46%	14.45%	14.44%	14.42%	14.41%
Required - Chapter 356 (MVA)	13.27%	13.16%	13.01%	12.88%	12.74%	12.59%	12.44%	12.27%	12.08%	11.87%
Sufficiency / (Deficiency)	1.26%	1.36%	1.49%	1.61%	1.74%	1.87%	2.01%	2.17%	2.34%	2.54%
Contributions										
Statutory - Chapter 353	1,004,148	1,030,656	1,065,557	1,096,224	1,126,913	1,159,275	1,191,360	1,224,368	1,258,452	1,293,495
Required - Chapter 356 (MVA)	916,743	934,378	955,743	974,395	992,020	1,009,523	1,025,512	1,040,389	1,053,920	1,065,636
Sufficiency / (Deficiency)	87,405	96,277	109,815	121,829	134,893	149,752	165,848	183,978	204,532	227,859
Funding Ratios										
Current Assets (MVA)	22,631,459	23,576,200	24,535,932	25,516,292	26,518,480	27,542,173	28,596,634	29,685,418	30,812,539	31,986,311
Actuarial Accrued Liability (AAL)	28,626,916	29,526,607	30,425,527	31,320,893	32,216,004	33,109,038	34,006,420	34,910,156	35,821,751	36,746,702
Unfunded AAL	5,995,457	5,950,407	5,889,595	5,804,601	5,697,525	5,566,864	5,409,786	5,224,739	5,009,212	4,760,390
Funding Ratio	79.1%	79.9%	80.6%	81.5%	82.3%	83.2%	84.1%	85.0%	86.0%	87.1%
Benefit Payments	1,717,129	1,797,140	1,881,089	1,961,193	2,043,205	2,119,498	2,194,315	2,268,653	2,338,813	2,406,943
Ratio of Assets to Benefit Payments	13.18	13.12	13.04	13.01	12.98	12.99	13.03	13.09	13.17	13.29

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 to PERA.

General Employees Retirement Plan

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 353	14.40%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
Required - Chapter 356 (MVA)	11.64%	11.39%	11.14%	10.85%	10.52%	10.14%	9.69%	9.16%	8.53%	7.74%
Sufficiency / (Deficiency)	2.76%	2.61%	2.86%	3.15%	3.48%	3.86%	4.31%	4.84%	5.47%	6.26%
Contributions										
Statutory - Chapter 353	1,329,570	1,329,603	1,367,552	1,406,500	1,446,572	1,487,626	1,529,845	1,573,318	1,617,941	1,663,716
Required - Chapter 356 (MVA)	1,075,102	1,081,661	1,087,880	1,090,044	1,087,091	1,077,448	1,059,247	1,029,822	985,299	920,185
Sufficiency / (Deficiency)	254,468	247,942	279,671	316,457	359,481	410,178	470,598	543,497	632,642	743,531
Funding Ratios										
Current Assets (MVA)	33,213,322	34,501,302	35,818,335	37,206,796	38,673,410	40,225,178	41,868,626	43,612,232	45,465,831	47,441,760
Actuarial Accrued Liability (AAL)	37,688,693	38,652,274	39,640,565	40,656,809	41,704,007	42,785,070	43,902,256	45,059,321	46,260,949	47,514,064
Unfunded AAL	4,475,370	4,150,972	3,822,231	3,450,014	3,030,597	2,559,892	2,033,630	1,447,089	795,119	72,304
Funding Ratio	88.1%	89.3%	90.4%	91.5%	92.7%	94.0%	95.4%	96.8%	98.3%	99.9%
Benefit Payments	2,472,488	2,537,149	2,600,970	2,664,461	2,727,961	2,792,297	2,856,239	2,919,180	2,979,315	3,039,271
Ratio of Assets to Benefit Payments	13.43	13.60	13.77	13.96	14.18	14.41	14.66	14.94	15.26	15.61

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 to PERA.

General Employees Retirement Plan
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 353	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%
Required - Chapter 356 (MVA)	7.30%	6.94%	6.57%	6.18%	5.77%	5.35%	4.91%	4.44%	3.96%	3.46%
Sufficiency / (Deficiency)	5.70%	6.06%	6.43%	6.82%	7.23%	7.65%	8.09%	8.56%	9.04%	9.54%
Contributions										
Statutory - Chapter 353	1,588,479	1,633,275	1,679,342	1,726,744	1,775,488	1,825,631	1,877,265	1,930,516	1,985,425	2,042,125
Required - Chapter 356 (MVA)	891,682	872,030	848,526	820,830	788,532	751,240	708,548	660,014	605,108	543,311
Sufficiency / (Deficiency)	696,798	761,245	830,816	905,914	986,956	1,074,391	1,168,717	1,270,502	1,380,317	1,498,814
Funding Ratios										
Current Assets (MVA)	49,550,561	51,675,742	53,942,069	56,360,286	58,941,292	61,696,341	64,636,291	67,771,983	71,115,332	74,678,743
Actuarial Accrued Liability (AAL)	48,823,362	50,192,845	51,626,773	53,129,605	54,705,462	56,358,316	58,091,175	59,906,405	61,806,728	63,794,664
Unfunded AAL	(727,199)	(1,482,897)	(2,315,296)	(3,230,681)	(4,235,830)	(5,338,025)	(6,545,116)	(7,865,577)	(9,308,604)	(10,884,079)
Funding Ratio	101.5%	103.0%	104.5%	106.1%	107.7%	109.5%	111.3%	113.1%	115.1%	117.1%
Benefit Payments	3,100,086	3,161,845	3,224,704	3,289,356	3,356,252	3,426,643	3,501,422	3,580,460	3,664,189	3,751,740
Ratio of Assets to Benefit Payments	15.98	16.34	16.73	17.13	17.56	18.00	18.46	18.93	19.41	19.91

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 to PERA.

General Employees Retirement Plan

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 353	14.53%	14.52%	14.50%	14.49%	14.48%	14.46%	14.45%	14.44%	14.42%	14.41%
Required - Chapter 356 (MVA)	13.27%	13.46%	13.63%	13.85%	14.09%	14.36%	14.65%	14.98%	15.34%	15.74%
Sufficiency / (Deficiency)	1.26%	1.06%	0.87%	0.64%	0.39%	0.10%	(0.20)%	(0.54)%	(0.92)%	(1.33)%
Contributions										
Statutory - Chapter 353	1,004,148	1,030,656	1,065,557	1,096,224	1,126,913	1,159,275	1,191,360	1,224,368	1,258,452	1,293,495
Required - Chapter 356 (MVA)	916,743	955,603	1,001,256	1,047,671	1,097,018	1,150,768	1,208,210	1,270,557	1,338,559	1,412,943
Sufficiency / (Deficiency)	87,405	75,052	64,301	48,553	29,895	8,506	(16,850)	(46,190)	(80,107)	(119,448)
Funding Ratios										
Current Assets (MVA)	22,631,459	23,242,169	23,834,061	24,410,485	24,970,169	25,510,164	26,036,882	26,550,764	27,052,472	27,546,672
Actuarial Accrued Liability (AAL)	28,626,916	29,526,607	30,425,527	31,320,893	32,216,004	33,109,038	34,006,420	34,910,156	35,821,751	36,746,702
Unfunded AAL	5,995,457	6,284,438	6,591,466	6,910,408	7,245,835	7,598,874	7,969,539	8,359,393	8,769,280	9,200,030
Funding Ratio	79.1%	78.7%	78.3%	77.9%	77.5%	77.1%	76.6%	76.1%	75.5%	75.0%
Benefit Payments	1,717,129	1,797,140	1,881,089	1,961,193	2,043,205	2,119,498	2,194,315	2,268,653	2,338,813	2,406,943
Ratio of Assets to Benefit Payments	13.18	12.93	12.67	12.45	12.22	12.04	11.87	11.70	11.57	11.44

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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General Employees Retirement Plan

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 353	14.40%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
Required - Chapter 356 (MVA)	16.19%	16.69%	17.29%	17.97%	18.75%	19.64%	20.69%	21.93%	23.41%	25.22%
Sufficiency / (Deficiency)	(1.79)%	(2.69)%	(3.29)%	(3.97)%	(4.75)%	(5.64)%	(6.69)%	(7.93)%	(9.41)%	(11.22)%
Contributions										
Statutory - Chapter 353	1,329,570	1,329,603	1,367,552	1,406,500	1,446,572	1,487,626	1,529,845	1,573,318	1,617,941	1,663,716
Required - Chapter 356 (MVA)	1,494,744	1,585,134	1,688,949	1,805,354	1,937,029	2,087,304	2,260,856	2,463,959	2,705,274	2,997,430
Sufficiency / (Deficiency)	(165,174)	(255,531)	(321,397)	(398,853)	(490,457)	(599,678)	(731,010)	(890,641)	(1,087,333)	(1,333,714)
Funding Ratios										
Current Assets (MVA)	28,035,982	28,523,818	28,973,867	29,423,767	29,874,868	30,328,373	30,784,563	31,245,192	31,712,830	32,191,958
Actuarial Accrued Liability (AAL)	37,688,693	38,652,274	39,640,565	40,656,809	41,704,007	42,785,070	43,902,256	45,059,321	46,260,949	47,514,064
Unfunded AAL	9,652,710	10,128,456	10,666,698	11,233,042	11,829,139	12,456,697	13,117,693	13,814,130	14,548,119	15,322,106
Funding Ratio	74.4%	73.8%	73.1%	72.4%	71.6%	70.9%	70.1%	69.3%	68.6%	67.8%
Benefit Payments	2,472,488	2,537,149	2,600,970	2,664,461	2,727,961	2,792,297	2,856,239	2,919,180	2,979,315	3,039,271
Ratio of Assets to Benefit Payments	11.34	11.24	11.14	11.04	10.95	10.86	10.78	10.70	10.64	10.59

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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General Employees Retirement Plan

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 353	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
Required - Chapter 356 (MVA)	27.49%	30.41%	34.31%	39.76%	47.95%	61.60%	88.91%	170.84%	17.33%	17.75%
Sufficiency / (Deficiency)	(13.49)%	(16.41)%	(20.31)%	(25.76)%	(33.95)%	(47.60)%	(74.91)%	(156.84)%	(3.33)%	(3.75)%
Contributions										
Statutory - Chapter 353	1,710,670	1,758,911	1,808,522	1,859,570	1,912,064	1,966,064	2,021,670	2,079,017	2,138,150	2,199,211
Required - Chapter 356 (MVA)	3,359,400	3,821,041	4,432,048	5,281,831	6,549,145	8,651,158	12,839,317	25,370,586	2,646,294	2,787,580
Sufficiency / (Deficiency)	(1,648,730)	(2,062,130)	(2,623,526)	(3,422,261)	(4,637,081)	(6,685,094)	(10,817,647)	(23,291,569)	(508,143)	(588,368)
Funding Ratios										
Current Assets (MVA)	32,684,622	33,191,946	33,715,149	34,255,440	34,813,461	35,389,434	35,982,368	36,590,393	37,211,799	37,844,372
Actuarial Accrued Liability (AAL)	48,823,362	50,192,845	51,626,773	53,129,605	54,705,462	56,358,316	58,091,175	59,906,405	61,806,728	63,794,664
Unfunded AAL	16,138,740	17,000,899	17,911,624	18,874,165	19,892,001	20,968,882	22,108,807	23,316,012	24,594,929	25,950,293
Funding Ratio	66.9%	66.1%	65.3%	64.5%	63.6%	62.8%	61.9%	61.1%	60.2%	59.3%
Benefit Payments	3,100,086	3,161,845	3,224,704	3,289,356	3,356,252	3,426,643	3,501,422	3,580,460	3,664,189	3,751,740
Ratio of Assets to Benefit Payments	10.54	10.50	10.46	10.41	10.37	10.33	10.28	10.22	10.16	10.09

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 to PERA.

General Employees Retirement Plan

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 353	14.53%	14.52%	14.50%	14.49%	14.48%	14.46%	14.45%	14.44%	14.42%	14.41%
Required - Chapter 356 (MVA)	13.27%	12.87%	12.38%	11.88%	11.33%	10.73%	10.06%	9.31%	8.46%	7.52%
Sufficiency / (Deficiency)	1.26%	1.65%	2.12%	2.61%	3.15%	3.73%	4.39%	5.13%	5.96%	6.89%
Contributions										
Statutory - Chapter 353	1,004,148	1,030,656	1,065,557	1,096,224	1,126,913	1,159,275	1,191,360	1,224,368	1,258,452	1,293,495
Required - Chapter 356 (MVA)	916,743	913,153	909,579	898,999	882,409	859,894	829,081	789,182	738,520	674,855
Sufficiency / (Deficiency)	87,405	117,502	155,978	197,225	244,504	299,380	362,279	435,185	519,932	618,640
Funding Ratios										
Current Assets (MVA)	22,631,459	23,910,231	25,247,825	26,654,079	28,134,822	29,694,786	31,348,805	33,106,600	34,978,962	36,981,680
Actuarial Accrued Liability (AAL)	28,626,916	29,526,607	30,425,527	31,320,893	32,216,004	33,109,038	34,006,420	34,910,156	35,821,751	36,746,702
Unfunded AAL	5,995,457	5,616,376	5,177,702	4,666,814	4,081,183	3,414,252	2,657,616	1,803,557	842,789	(234,978)
Funding Ratio	79.1%	81.0%	83.0%	85.1%	87.3%	89.7%	92.2%	94.8%	97.7%	100.6%
Benefit Payments	1,717,129	1,797,140	1,881,089	1,961,193	2,043,205	2,119,498	2,194,315	2,268,653	2,338,813	2,406,943
Ratio of Assets to Benefit Payments	13.18	13.30	13.42	13.59	13.77	14.01	14.29	14.59	14.96	15.36

Numbers may not add due to rounding.

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General Employees Retirement Plan

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 353	13.40%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%
Required - Chapter 356 (MVA)	6.78%	6.00%	5.21%	4.37%	3.48%	2.54%	1.54%	0.49%	0.00%	0.00%
Sufficiency / (Deficiency)	6.62%	7.00%	7.79%	8.63%	9.52%	10.46%	11.46%	12.51%	13.00%	13.00%
Contributions										
Statutory - Chapter 353	1,237,244	1,234,631	1,269,869	1,306,036	1,343,246	1,381,367	1,420,570	1,460,939	1,502,373	1,544,879
Required - Chapter 356 (MVA)	625,606	570,031	508,724	438,799	359,445	269,612	168,360	54,589	-	-
Sufficiency / (Deficiency)	611,638	664,601	761,145	867,237	983,800	1,111,755	1,252,210	1,406,350	1,502,373	1,544,879
Funding Ratios										
Current Assets (MVA)	39,129,597	41,343,063	43,684,944	46,207,214	48,927,412	51,864,416	55,037,804	58,470,378	62,187,710	66,219,462
Actuarial Accrued Liability (AAL)	37,688,693	38,652,274	39,640,565	40,656,809	41,704,007	42,785,070	43,902,256	45,059,321	46,260,949	47,514,064
Unfunded AAL	(1,440,904)	(2,690,789)	(4,044,378)	(5,550,405)	(7,223,406)	(9,079,346)	(11,135,548)	(13,411,057)	(15,926,761)	(18,705,398)
Funding Ratio	103.8%	107.0%	110.2%	113.7%	117.3%	121.2%	125.4%	129.8%	134.4%	139.4%
Benefit Payments	2,472,488	2,537,149	2,600,970	2,664,461	2,727,961	2,792,297	2,856,239	2,919,180	2,979,315	3,039,271
Ratio of Assets to Benefit Payments	15.83	16.30	16.80	17.34	17.94	18.57	19.27	20.03	20.87	21.79

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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General Employees Retirement Plan

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 353	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%
Required - Chapter 356 (MVA)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sufficiency / (Deficiency)	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%
Contributions										
Statutory - Chapter 353	1,588,479	1,633,275	1,679,342	1,726,744	1,775,488	1,825,631	1,877,265	1,930,516	1,985,425	2,042,125
Required - Chapter 356 (MVA)	-	-	-	-	-	-	-	-	-	-
Sufficiency / (Deficiency)	1,588,479	1,633,275	1,679,342	1,726,744	1,775,488	1,825,631	1,877,265	1,930,516	1,985,425	2,042,125
Funding Ratios										
Current Assets (MVA)	70,595,221	75,346,178	80,506,346	86,112,715	92,204,945	98,825,802	106,020,652	113,838,104	122,331,408	131,558,200
Actuarial Accrued Liability (AAL)	48,823,362	50,192,845	51,626,773	53,129,605	54,705,462	56,358,316	58,091,175	59,906,405	61,806,728	63,794,664
Unfunded AAL	(21,771,859)	(25,153,333)	(28,879,573)	(32,983,110)	(37,499,483)	(42,467,486)	(47,929,476)	(53,931,698)	(60,524,681)	(67,763,536)
Funding Ratio	144.6%	150.1%	155.9%	162.1%	168.6%	175.4%	182.5%	190.0%	197.9%	206.2%
Benefit Payments	3,100,086	3,161,845	3,224,704	3,289,356	3,356,252	3,426,643	3,501,422	3,580,460	3,664,189	3,751,740
Ratio of Assets to Benefit Payments	22.77	23.83	24.97	26.18	27.47	28.84	30.28	31.79	33.39	35.07

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.