GRS Retirement Consulting

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January 31, 2019

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 – Police & Fire Plan

Dear Doug:

Attached are 30-year projections of estimated funded status, required contributions, and statutory contributions under three asset return scenarios for the Public Employees Police & Fire 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 Public Employees Police & Fire Retirement Plan actuarial funding valuation 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 market value of assets with no smoothing of investment gains or losses. Payroll is assumed to increase approximately 3.25% 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 11,673 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 29.5
- Average salary at hire is $59,300
- Approximately 11% female, 89% 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.

The State of Minnesota provides a $9.0 million contribution to the fund each October 1 until both the MSRS State Patrol Fund and the PERA Police & Fire Plan become 90% funded (on an Actuarial Value basis) or July 1, 2048, if earlier. For purposes of the enclosed projections, we have assumed these contributions stop when the PERA Police & Fire Plan becomes 90% funded, or July 1, 2048 if earlier. These state contributions are projected to be eliminated in fiscal years ending 2022, 2022, and 2049 in the 9.0%, 7.5% and 6.0% investment return scenarios, respectively.

Additional state contributions of $4.5 million in fiscal years 2019 and 2020 and $9.0 million thereafter are expected until the plan reaches 100% funding (on an Actuarial Value basis), or July 1, 2048, if earlier. The additional state contributions are projected to be eliminated in fiscal years ending 2026, 2032, 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 Public Employees Police & Fire Plan 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.
- 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% 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.
- We typically 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.
- 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

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 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.

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 contribution rates shown in this report have been determined using the actuarial assumptions and methods disclosed in the Actuarial Basics section of the July 1, 2018 valuation report. This valuation report includes risk metrics on page 8, 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.

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

In a 2018 analysis of long-term rate of investment return and inflation assumptions, GRS suggested that the current statutory investment return assumption of 7.5% is at the top of the reasonable range. Please see our letter dated October 3, 2018 for additional information. If capital markets decline further from the present levels, the 7.5% return assumption might not comply with actuarial standards for the July 1, 2019 valuation.

The 2018 analysis also 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 the modeling we have done, 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.

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 Public Employees Police & Fire 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: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% 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 30 years, and
(3) The unfunded liability will grow initially as a dollar amount before beginning to decline.

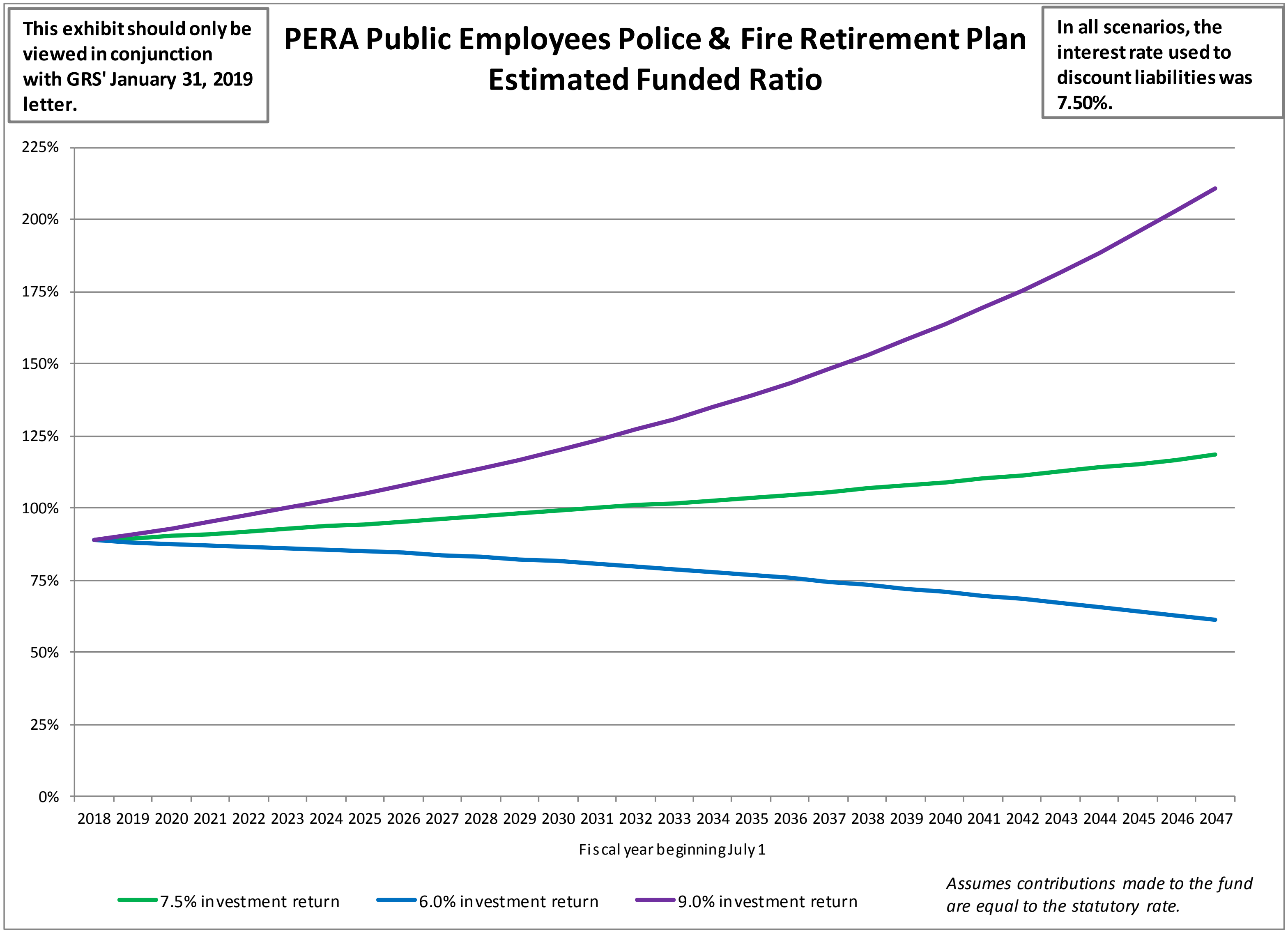
Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the 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

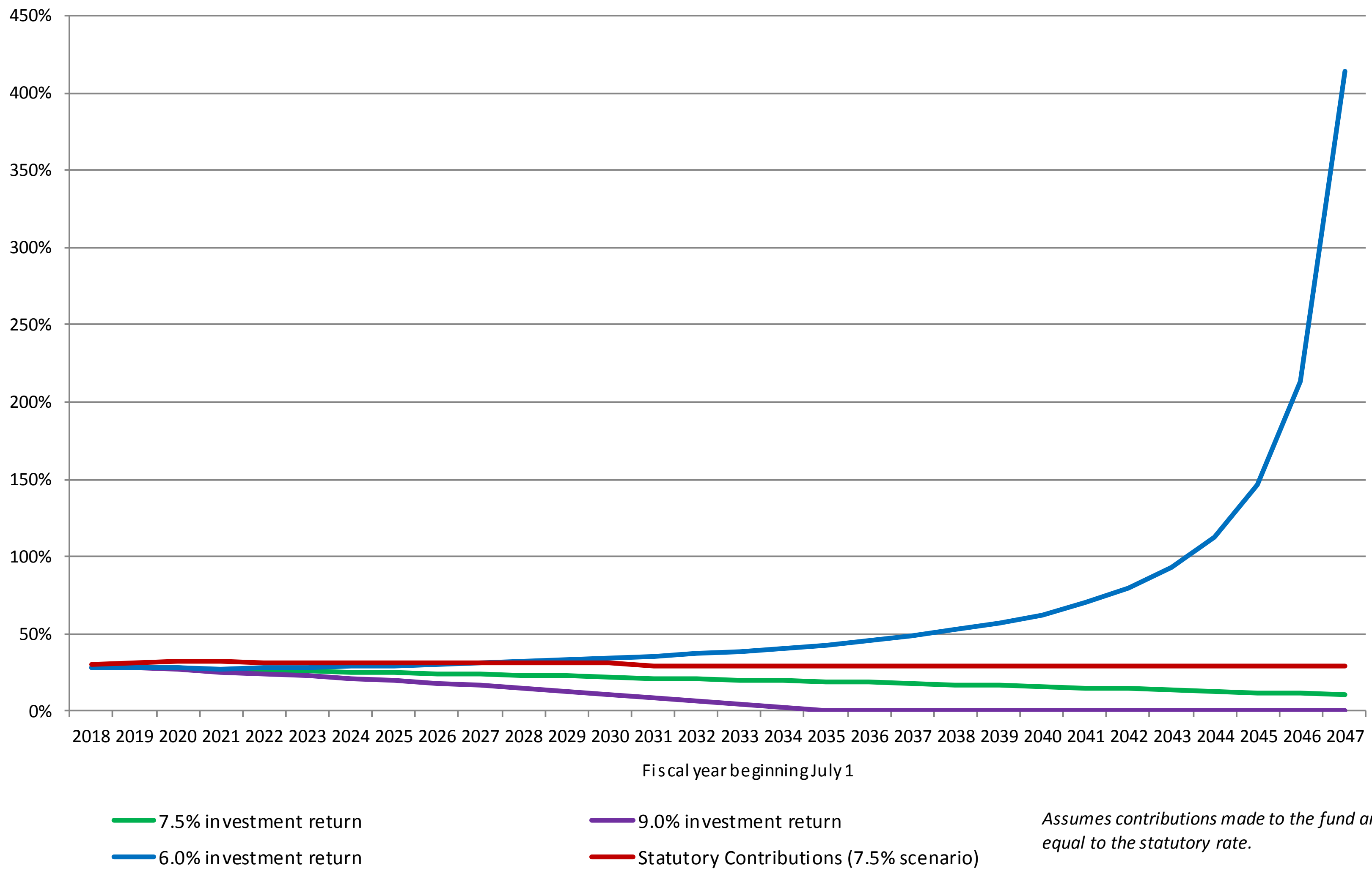
Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the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


This exhibit should only be viewed in conjunction with GRS' January 31, 2019 letter.
PERA Public Employees Police & Fire Retirement Plan
Estimated Funded Ratio
In all scenarios, the interest rate used to discount liabilities was 7.50%.
225%
200%
175%
150%
125%
100%
75%
50%
25%
0%
2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047
Fiscal year beginning July 1
7.5% investment return
6.0% investment return
9.0% investment return
Assumes contributions made to the fund are equal to the statutory rate.

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

PERA Public Employees Police & Fire Retirement Plan
Estimated Required Contribution Rates (% of Pay)

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



Assumes contributions made to the fund are equal to the statutory rate.

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

Public Employees Police & Fire Retirement Plan

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 353	30.5%	31.7%	32.6%	31.7%	31.7%	31.6%	31.6%	31.5%	31.4%	31.4%
Required - Chapter 356 (MVA)	27.2%	27.0%	26.7%	26.3%	26.0%	25.6%	25.2%	24.8%	24.3%	23.8%
Sufficiency / (Deficiency)	3.3%	4.7%	6.0%	5.4%	5.7%	6.0%	6.4%	6.7%	7.2%	7.6%
Contributions										
Statutory - Chapter 353	305,219	326,318	346,063	345,993	355,246	364,938	374,962	385,434	396,366	407,783
Required - Chapter 356 (MVA)	272,412	278,070	282,892	286,834	291,167	295,391	299,343	303,009	306,265	308,985
Sufficiency / (Deficiency)	32,807	48,248	63,171	59,159	64,078	69,546	75,620	82,425	90,102	98,798
Funding Ratios										
Current Assets (MVA)	8,486,907	8,865,230	9,273,504	9,710,968	10,157,415	10,621,845	11,104,077	11,604,547	12,123,548	12,662,008
Actuarial Accrued Liability (AAL)	9,552,804	9,907,748	10,275,234	10,654,739	11,045,507	11,447,328	11,859,414	12,281,643	12,713,608	13,155,465
Unfunded AAL	1,065,897	1,042,518	1,001,730	943,770	888,092	825,484	755,336	677,096	590,060	493,457
Funding Ratio	88.8%	89.5%	90.3%	91.1%	92.0%	92.8%	93.6%	94.5%	95.4%	96.3%
Benefit Payments	553,182	572,734	593,830	616,700	640,864	666,940	694,217	722,972	752,635	782,569
Ratio of Assets to Benefit Payments	15.34	15.48	15.62	15.75	15.85	15.93	16.00	16.05	16.11	16.18

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 to PERA.

Public Employees Police & Fire Retirement Plan

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 353	31.3%	31.3%	31.2%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%
Required - Chapter 356 (MVA)	23.2%	22.6%	21.9%	21.1%	20.6%	20.1%	19.6%	19.0%	18.4%	17.8%
Sufficiency / (Deficiency)	8.1%	8.7%	9.3%	8.4%	8.9%	9.4%	9.9%	10.5%	11.1%	11.7%
Contributions										
Statutory - Chapter 353	419,853	432,336	445,364	434,586	448,576	463,146	478,213	493,853	510,018	526,771
Required - Chapter 356 (MVA)	311,117	312,271	312,303	311,009	313,548	315,688	317,294	318,348	318,732	318,391
Sufficiency / (Deficiency)	108,736	120,066	133,060	123,577	135,028	147,459	160,919	175,505	191,285	208,380
Funding Ratios										
Current Assets (MVA)	13,221,605	13,804,657	14,412,736	15,047,905	15,687,202	16,355,992	17,056,653	17,790,803	18,560,327	19,367,765
Actuarial Accrued Liability (AAL)	13,608,067	14,072,723	14,550,118	15,041,236	15,547,185	16,068,791	16,607,187	17,162,735	17,735,906	18,327,752
Unfunded AAL	386,463	268,066	137,383	(6,669)	(140,017)	(287,201)	(449,466)	(628,068)	(824,421)	(1,040,013)
Funding Ratio	97.2%	98.1%	99.1%	100.0%	100.9%	101.8%	102.7%	103.7%	104.7%	105.7%
Benefit Payments	812,447	842,918	873,752	904,871	936,605	968,759	1,002,150	1,036,719	1,071,918	1,108,295
Ratio of Assets to Benefit Payments	16.27	16.38	16.50	16.63	16.75	16.88	17.02	17.16	17.32	17.48

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 to PERA.

Public Employees Police & Fire Retirement Plan

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 353	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%
Required - Chapter 356 (MVA)	17.2%	16.5%	15.9%	15.1%	14.4%	13.6%	12.8%	12.0%	11.1%	10.2%
Sufficiency / (Deficiency)	12.3%	13.0%	13.6%	14.4%	15.1%	15.9%	16.7%	17.5%	18.4%	19.3%
Contributions										
Statutory - Chapter 353	544,147	562,106	580,728	600,002	620,005	640,699	662,024	684,011	706,710	730,171
Required - Chapter 356 (MVA)	317,245	315,172	312,117	307,945	302,584	295,865	287,608	277,694	265,988	252,340
Sufficiency / (Deficiency)	226,901	246,933	268,611	292,057	317,421	344,834	374,416	406,317	440,722	477,832
Funding Ratios										
Current Assets (MVA)	20,215,349	21,105,888	22,042,275	23,027,834	24,066,071	25,160,972	26,316,542	27,536,065	28,822,803	30,180,368
Actuarial Accrued Liability (AAL)	18,938,849	19,570,222	20,222,885	20,898,083	21,597,116	22,321,552	23,072,830	23,851,524	24,657,966	25,492,603
Unfunded AAL	(1,276,500)	(1,535,666)	(1,819,390)	(2,129,751)	(2,468,955)	(2,839,420)	(3,243,712)	(3,684,541)	(4,164,837)	(4,687,765)
Funding Ratio	106.7%	107.9%	109.0%	110.2%	111.4%	112.7%	114.1%	115.5%	116.9%	118.4%
Benefit Payments	1,145,486	1,183,576	1,222,437	1,262,124	1,302,503	1,343,808	1,386,962	1,432,254	1,479,634	1,529,058
Ratio of Assets to Benefit Payments	17.65	17.83	18.03	18.25	18.48	18.72	18.97	19.23	19.48	19.74

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 to PERA.

Public Employees Police & Fire Retirement Plan
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 353	30.5%	31.7%	32.6%	32.6%	32.5%	32.4%	32.3%	32.2%	32.1%	32.1%
Required - Chapter 356 (MVA)	27.2%	27.7%	28.2%	28.7%	29.2%	29.8%	30.5%	31.2%	32.0%	32.9%
Sufficiency / (Deficiency)	3.3%	4.0%	4.4%	3.9%	3.3%	2.6%	1.9%	1.0%	0.2%	(0.8)%
Contributions										
Statutory - Chapter 353	305,219	326,318	346,063	354,993	364,246	373,938	383,962	394,434	405,366	416,783
Required - Chapter 356 (MVA)	272,412	285,546	298,928	312,674	327,641	344,050	361,962	381,630	403,245	427,054
Sufficiency / (Deficiency)	32,807	40,772	47,135	42,320	36,605	29,888	22,000	12,803	2,122	(10,271)
Funding Ratios										
Current Assets (MVA)	8,486,907	8,739,793	9,009,417	9,293,799	9,580,859	9,869,754	10,159,076	10,447,957	10,735,304	11,020,567
Actuarial Accrued Liability (AAL)	9,552,804	9,907,748	10,275,234	10,654,739	11,045,507	11,447,328	11,859,414	12,281,643	12,713,608	13,155,465
Unfunded AAL	1,065,897	1,167,955	1,265,816	1,360,940	1,464,648	1,577,575	1,700,337	1,833,686	1,978,304	2,134,898
Funding Ratio	88.8%	88.2%	87.7%	87.2%	86.7%	86.2%	85.7%	85.1%	84.4%	83.8%
Benefit Payments	553,182	572,734	593,830	616,700	640,864	666,940	694,217	722,972	752,635	782,569
Ratio of Assets to Benefit Payments	15.34	15.26	15.17	15.07	14.95	14.80	14.63	14.45	14.26	14.08

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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Public Employees Police & Fire Retirement Plan

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 353	32.0%	31.9%	31.8%	30.7%	30.7%	30.7%	30.6%	30.6%	30.5%	30.5%
Required - Chapter 356 (MVA)	33.8%	34.9%	36.1%	37.4%	39.0%	40.8%	42.9%	45.2%	48.0%	51.2%
Sufficiency / (Deficiency)	(1.8)%	(3.0)%	(4.3)%	(6.7)%	(8.3)%	(10.2)%	(12.2)%	(14.6)%	(17.4)%	(20.7)%
Contributions										
Statutory - Chapter 353	428,853	441,336	454,364	452,586	466,576	481,146	496,213	511,853	528,018	544,771
Required - Chapter 356 (MVA)	453,458	482,617	515,063	551,265	593,199	640,655	694,692	756,841	829,029	913,967
Sufficiency / (Deficiency)	(24,605)	(41,281)	(60,700)	(98,679)	(126,623)	(159,509)	(198,479)	(244,988)	(301,011)	(369,196)
Funding Ratios										
Current Assets (MVA)	11,303,836	11,585,722	11,865,954	12,144,618	12,406,076	12,664,901	12,921,099	13,173,747	13,422,007	13,665,508
Actuarial Accrued Liability (AAL)	13,608,067	14,072,723	14,550,118	15,041,236	15,547,185	16,068,791	16,607,187	17,162,735	17,735,906	18,327,752
Unfunded AAL	2,304,231	2,487,001	2,684,165	2,896,618	3,141,109	3,403,890	3,686,088	3,988,989	4,313,898	4,662,244
Funding Ratio	83.1%	82.3%	81.6%	80.7%	79.8%	78.8%	77.8%	76.8%	75.7%	74.6%
Benefit Payments	812,447	842,918	873,752	904,871	936,605	968,759	1,002,150	1,036,719	1,071,918	1,108,295
Ratio of Assets to Benefit Payments	13.91	13.74	13.58	13.42	13.25	13.07	12.89	12.71	12.52	12.33

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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Public Employees Police & Fire Retirement Plan

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 353	30.5%	30.4%	30.4%	30.4%	30.4%	30.3%	30.3%	30.3%	30.3%	30.2%
Required - Chapter 356 (MVA)	55.1%	59.8%	65.7%	73.2%	83.2%	97.3%	118.3%	153.3%	223.4%	433.5%
Sufficiency / (Deficiency)	(24.6)%	(29.3)%	(35.2)%	(42.8)%	(52.9)%	(66.9)%	(88.0)%	(123.1)%	(193.1)%	(403.2)%
Contributions										
Statutory - Chapter 353	562,147	580,106	598,728	618,002	638,005	658,699	680,024	702,011	724,710	748,171
Required - Chapter 356 (MVA)	1,015,423	1,138,796	1,292,277	1,488,629	1,749,219	2,112,367	2,654,763	3,555,478	5,351,647	10,728,796
Sufficiency / (Deficiency)	(453,276)	(558,691)	(693,549)	(870,627)	(1,111,214)	(1,453,668)	(1,974,739)	(2,853,467)	(4,626,937)	(9,980,625)
Funding Ratios										
Current Assets (MVA)	13,903,353	14,135,005	14,359,764	14,577,105	14,786,400	14,987,203	15,178,760	15,359,260	15,526,516	15,678,315
Actuarial Accrued Liability (AAL)	18,938,849	19,570,222	20,222,885	20,898,083	21,597,116	22,321,552	23,072,830	23,851,524	24,657,966	25,492,603
Unfunded AAL	5,035,496	5,435,217	5,863,121	6,320,978	6,810,716	7,334,349	7,894,070	8,492,264	9,131,450	9,814,288
Funding Ratio	73.4%	72.2%	71.0%	69.8%	68.5%	67.1%	65.8%	64.4%	63.0%	61.5%
Benefit Payments	1,145,486	1,183,576	1,222,437	1,262,124	1,302,503	1,343,808	1,386,962	1,432,254	1,479,634	1,529,058
Ratio of Assets to Benefit Payments	12.14	11.94	11.75	11.55	11.35	11.15	10.94	10.72	10.49	10.25

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 to PERA.

Public Employees Police & Fire Retirement Plan

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 353	30.5%	31.7%	32.6%	31.7%	31.7%	31.6%	31.6%	30.8%	30.7%	30.7%
Required - Chapter 356 (MVA)	27.2%	26.3%	25.2%	23.9%	22.5%	21.0%	19.4%	18.0%	16.4%	14.7%
Sufficiency / (Deficiency)	3.3%	5.4%	7.5%	7.9%	9.2%	10.6%	12.2%	12.8%	14.3%	16.0%
Contributions										
Statutory - Chapter 353	305,219	326,318	346,063	345,993	355,246	364,938	374,962	376,434	387,366	398,783
Required - Chapter 356 (MVA)	272,412	270,594	266,627	260,250	252,486	242,554	229,948	220,176	206,768	191,263
Sufficiency / (Deficiency)	32,807	55,723	79,436	85,744	102,759	122,384	145,014	156,258	180,598	207,520
Funding Ratios										
Current Assets (MVA)	8,486,907	8,990,667	9,541,354	10,140,162	10,768,863	11,438,534	12,151,324	12,910,204	13,708,838	14,559,742
Actuarial Accrued Liability (AAL)	9,552,804	9,907,748	10,275,234	10,654,739	11,045,507	11,447,328	11,859,414	12,281,643	12,713,608	13,155,465
Unfunded AAL	1,065,897	917,081	733,880	514,577	276,644	8,794	(291,910)	(628,561)	(995,230)	(1,404,277)
Funding Ratio	88.8%	90.7%	92.9%	95.2%	97.5%	99.9%	102.5%	105.1%	107.8%	110.7%
Benefit Payments	553,182	572,734	593,830	616,700	640,864	666,940	694,217	722,972	752,635	782,569
Ratio of Assets to Benefit Payments	15.34	15.70	16.07	16.44	16.80	17.15	17.50	17.86	18.21	18.61

Numbers may not add due to rounding.

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Public Employees Police & Fire Retirement Plan

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 353	30.6%	30.6%	30.6%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%
Required - Chapter 356 (MVA)	12.9%	11.1%	9.1%	7.0%	4.9%	2.6%	0.3%	0.0%	0.0%	0.0%
Sufficiency / (Deficiency)	17.7%	19.5%	21.5%	22.5%	24.6%	26.9%	29.3%	29.5%	29.5%	29.5%
Contributions										
Statutory - Chapter 353	410,853	423,336	436,364	434,586	448,576	463,146	478,213	493,853	510,018	526,771
Required - Chapter 356 (MVA)	173,533	153,132	129,878	103,399	74,243	41,281	4,048	0	0	0
Sufficiency / (Deficiency)	237,320	270,204	306,486	331,187	374,333	421,865	474,165	493,853	510,018	526,771
Funding Ratios										
Current Assets (MVA)	15,467,840	16,439,019	17,478,766	18,593,442	19,774,019	21,042,260	22,406,222	23,873,743	25,453,510	27,155,514
Actuarial Accrued Liability (AAL)	13,608,067	14,072,723	14,550,118	15,041,236	15,547,185	16,068,791	16,607,187	17,162,735	17,735,906	18,327,752
Unfunded AAL	(1,859,773)	(2,366,296)	(2,928,648)	(3,552,206)	(4,226,834)	(4,973,469)	(5,799,035)	(6,711,008)	(7,717,605)	(8,827,762)
Funding Ratio	113.7%	116.8%	120.1%	123.6%	127.2%	131.0%	134.9%	139.1%	143.5%	148.2%
Benefit Payments	812,447	842,918	873,752	904,871	936,605	968,759	1,002,150	1,036,719	1,071,918	1,108,295
Ratio of Assets to Benefit Payments	19.04	19.50	20.00	20.55	21.11	21.72	22.36	23.03	23.75	24.50

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.

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Public Employees Police & Fire Retirement Plan

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 353	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%
Required - Chapter 356 (MVA)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sufficiency / (Deficiency)	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%	29.5%
Contributions										
Statutory - Chapter 353	544,147	562,106	580,728	600,002	620,005	640,699	662,024	684,011	706,710	730,171
Required - Chapter 356 (MVA)	0	0	0	0	0	0	0	0	0	0
Sufficiency / (Deficiency)	544,147	562,106	580,728	600,002	620,005	640,699	662,024	684,011	706,710	730,171
Funding Ratios										
Current Assets (MVA)	28,990,139	30,969,117	33,105,108	35,412,130	37,905,392	40,601,690	43,519,052	46,676,096	50,092,850	53,791,248
Actuarial Accrued Liability (AAL)	18,938,849	19,570,222	20,222,885	20,898,083	21,597,116	22,321,552	23,072,830	23,851,524	24,657,966	25,492,603
Unfunded AAL	(10,051,289)	(11,398,895)	(12,882,223)	(14,514,048)	(16,308,276)	(18,280,138)	(20,446,221)	(22,824,572)	(25,434,884)	(28,298,646)
Funding Ratio	153.1%	158.3%	163.7%	169.5%	175.5%	181.9%	188.6%	195.7%	203.2%	211.0%
Benefit Payments	1,145,486	1,183,576	1,222,437	1,262,124	1,302,503	1,343,808	1,386,962	1,432,254	1,479,634	1,529,058
Ratio of Assets to Benefit Payments	25.31	26.17	27.08	28.06	29.10	30.21	31.38	32.59	33.85	35.18

Numbers may not add due to rounding.

The interest rate used to discount liabilities was 7.5%.