

January 30, 2015

CONFIDENTIAL

Mr. Dave Bergstrom
Executive Director
Minnesota State Retirement System
60 Empire Drive, Suite 300
St. Paul, MN 55103

Re: Projection of Contributions and Funding Status – State Patrol Retirement Fund

Dear Dave:

Attached are 30-year projections of estimated funded status, required contributions, and statutory contributions under three asset return scenarios for the State Patrol Retirement Fund (SPRF). Unless noted otherwise, the estimates are based on participant data, assumptions, methods, and plan provisions as detailed in the State Patrol Retirement Fund Actuarial Valuation Report for funding purposes as of July 1, 2014.

As required by the State of Minnesota Standards for Actuarial Work, the projections reflect three asset return scenarios. The statutory investment return assumption is a select and ultimate approach with rates of 8.0% for the 5-year period ending June 30, 2017 and 8.5% thereafter. The scenarios assume future investment returns of 1.5% more than the assumed rate, the assumed rate, and 1.5% less than the assumed rate. Note that we believe the 10% rate of return assumption is outside of the range of reasonable expected returns for this plan.

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

The estimates are based on the market value of assets with no smoothing of investment gains or losses. In all scenarios, the valuation interest rate used to discount liabilities was the single effective interest rate used in the July 1, 2014 valuation of 8.40%, which produces a similar liability stream as trending to a liability that reflects the expiration of the 5-year select period on June 30, 2017.

Payroll is assumed to increase approximately 3.75% a 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 858 members. The profile of these new members is the same as new members hired between July 1, 2010 and July 1, 2013:

- Average age at hire is 30.6
- Average salary at hire is \$61,200; and
- Approximately 10% female, 90% male

If actuarial accrued liability exceeds assets, the unfunded actuarial accrued liability is amortized through June 30, 2038 per Minnesota Statute 356.215, Subdivision 11. As directed by MSRS, the statutory amortization date is assumed to be changed to June 30, 2068 once the current period expires in 2038. 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.

Based on MSRS' direction, we have shown projection results with and without the contribution stabilizer defined in Minnesota Statute 352.045, summarized in the attached Exhibit A.

Based on the operations of the stabilizer, the projected highest annual statutory contribution rate is:

Assumed Investment Return	Maximum Statutory Contribution (percent of pay)
6.5%/7.0%	58.49%
8.0%/8.5%	38.54%
9.5%/10.0%	37.39%

In the least optimistic scenario, the maximum contribution rate attained in the 30-year projection period is significantly higher than the current rate of 34.98%.

The State of Minnesota provides a \$1,000,000 contribution to the State Patrol Fund each October 1 until both the State Patrol Fund and the PERA Police and Fire plan become 90% funded (on a Market Value basis). For purposes of this projection, the \$1,000,000 contribution is assumed to continue until the State Patrol Fund reaches the threshold required to pay a 2.5% benefit increase.

Post-retirement Benefit Increases

A very significant assumption affecting the projected estimates is the expectation of annual increases in the benefits being paid to retirees and beneficiaries. If the plan reaches a funding ratio of 85% (based on a 1.5% post-retirement benefit increase assumption) on a market value of assets basis for two consecutive years in the future, post-retirement increases will increase from 1.0% to 1.5%. Similarly, if the plan reaches a funding ratio of 90% (based on a 2.5% post-retirement benefit increase assumption) on a market value of assets basis for two consecutive years in the future, post-retirement increases will increase from 1.5% to 2.5%.

For the actuarial valuation as of July 1, 2014, an actuarial projection was performed to estimate when this plan is expected to attain the threshold required to pay a 1.5% or 2.5% post-retirement benefit increase. The projection indicated that if all assumptions were met, the threshold is expected to be attained in approximately 4 years and the funding ratio threshold to pay the 2.5% benefit increase is expected to be attained in approximately 19 years. This assumption is reflected in our valuation calculations and in the 8.5% ultimate rate of return projection scenarios (with and without contribution stabilizer).

Under the 10% ultimate rate of return scenario, the funded status of the plan is expected to improve. As the plan experiences greater than expected investment return each year, the assumed 1.5% benefit increase date of January 1, 2018 and the assumed 2.5% benefit increase date of January 1, 2033 are accelerated. We performed a projection to estimate when the plan is expected to attain these thresholds if future investment returns are 9.5% through June 30, 2017 and 10.0% thereafter. This projection indicated the plan would begin paying a 1.5% benefit increase on January 1, 2017 and would begin paying a 2.5% benefit increase on January 1, 2024 under this investment return scenario. To approximate the acceleration of the assumed benefit increase dates from 2018/2033 to 2017/2024, we assumed the accrued liability and normal cost would increase a proportionate amount between 2014 and 2024. The same benefit increase assumptions were made for the 10% ultimate rate of return with contribution stabilizer scenario.

Under the 7% ultimate rate of return scenario, the funded status of the plan is expected to deteriorate. As the plan experiences lower than expected investment returns each year, the assumed 1.5% and 2.5% benefit increase dates become later each year until they are no longer projected to be attained. We assumed for purposes of this projection that this transition from the current assumption that the benefit increase will change from 1.0% to 1.5% on January 1, 2018 and from 1.5% to 2.5% on January 1, 2033 to an assumption that the benefit increase will remain at 1.0% for all years would occur by July 1, 2044. The same benefit increase assumptions were made for the 7% ultimate rate of return contribution stabilizer scenario.

Comments

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 Minnesota State Retirement System (MSRS), concerning benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries.

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 Directors. 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. MSRS is solely responsible for communicating to GRS any changes required thereto.

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. A revision of ASOP No. 27, applicable to valuation dates on or after September 30, 2014, will guide assumption setting for future valuations. A recent review of inflation and investment return assumptions for accounting and financial reporting purposes developed a recommended range of 6.99% to 7.92% for the assumed investment return. Additional review and discussion will be required before the next valuation.

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

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

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. In addition, Mr. Murphy meets the requirements of "approved actuary" under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

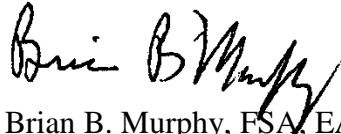
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This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the Correctional Employees Retirement Fund 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.

Sincerely,



Bonita J. Wurst, ASA, EA, MAAA



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

BJW/BBM:mrb
Enclosures

Exhibit A

State Patrol Retirement Fund

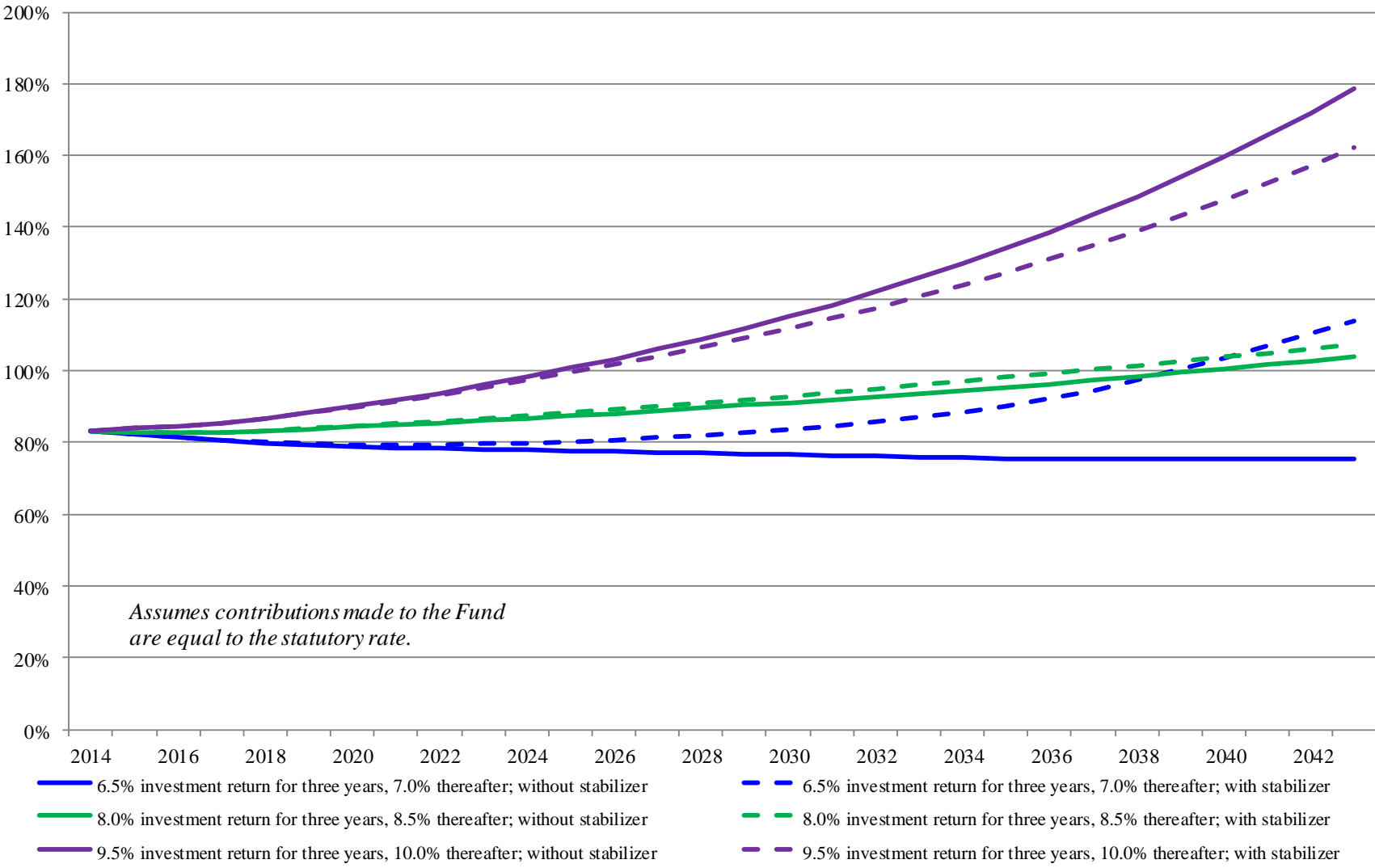
Contribution Stabilizer

The following is a summary of Minnesota Statute 352.045:

- If a contribution sufficiency of at least 1.0% has existed for two consecutive years, member contributions are decreased by at most 0.25% and employer contributions are decreased by at most 0.375% to a level that is necessary to maintain a 2.0% sufficiency. A contribution rate decrease under this section must not be made until at least two years have passed since fully implementing a previous decrease.
- If a contribution deficiency of at least 0.5% has existed for two consecutive years, the member and employer contribution rates are increased as follows:
 - If the contribution deficiency is less than 2.0%, member contributions are increased 0.25% and employer contributions are increased by 0.375%.
 - If the contribution deficiency is greater than 1.99% and less than 4.01%, member contributions are increased 0.50% and employer contributions are increased by 0.75%.
 - If the contribution deficiency is greater than 4.0%, member contributions are increased by 0.75% and employer contributions are increased by 1.125%.

This exhibit should only be viewed in conjunction with GRS' January 30, 2015 letter to MSRS.

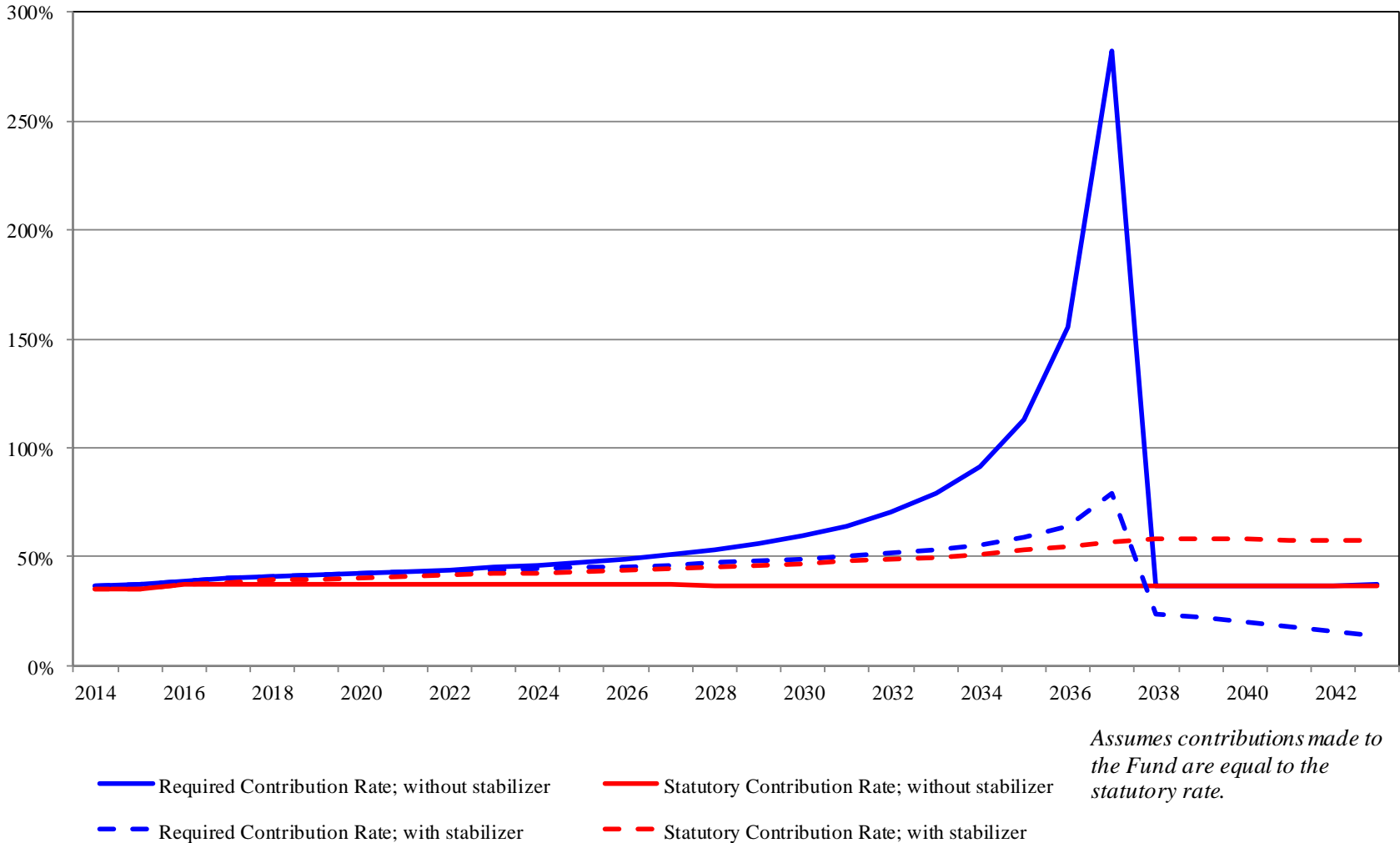
State Patrol Retirement Fund Estimated Funded Ratio



This exhibit should only be viewed in conjunction with GRS' January 30, 2015 letter to MSRS.

State Patrol Retirement Fund Estimated Contribution Rates

Investment Return of 6.5% for three years; 7.0% thereafter

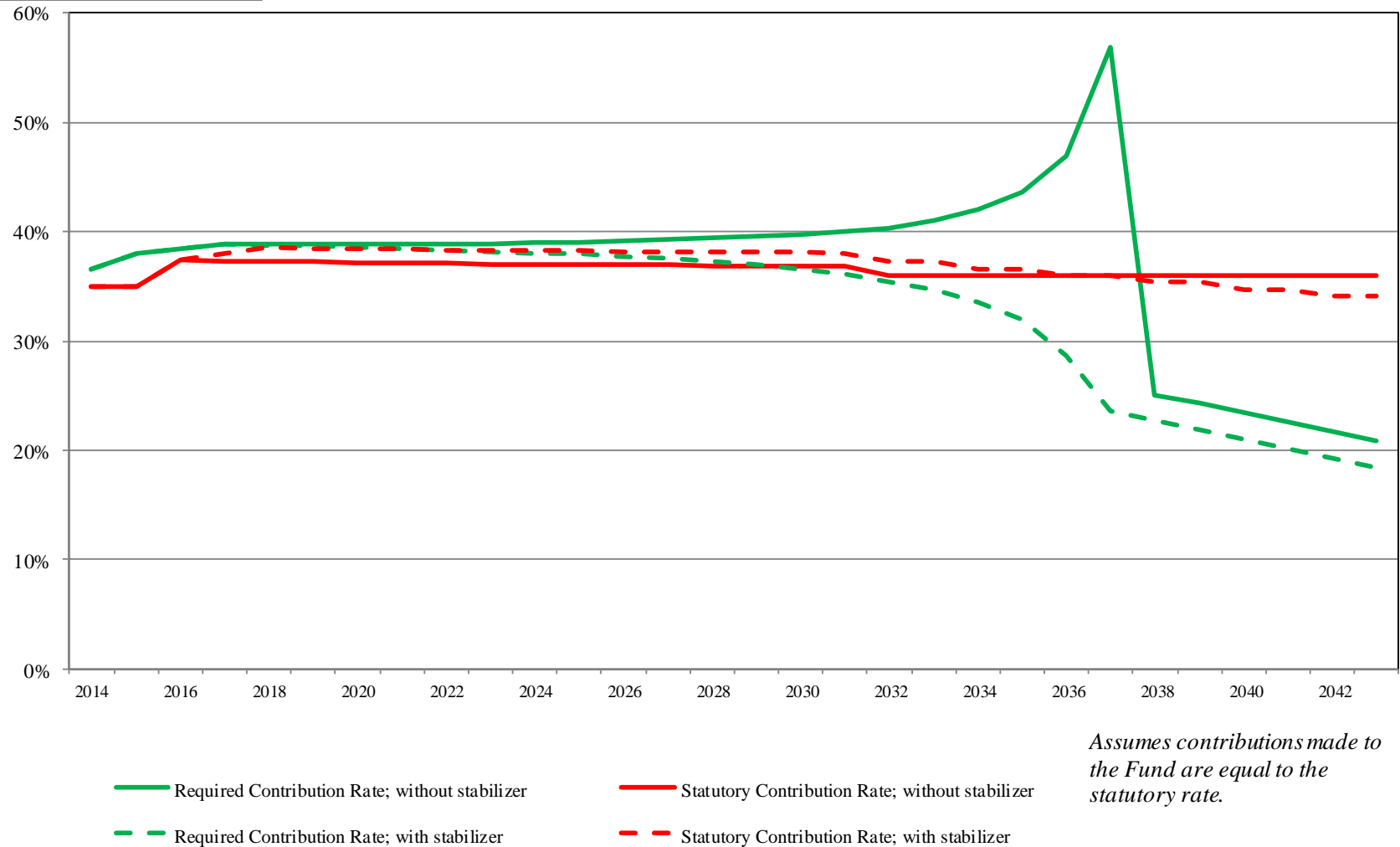


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State Patrol Retirement Fund

Estimated Contribution Rates

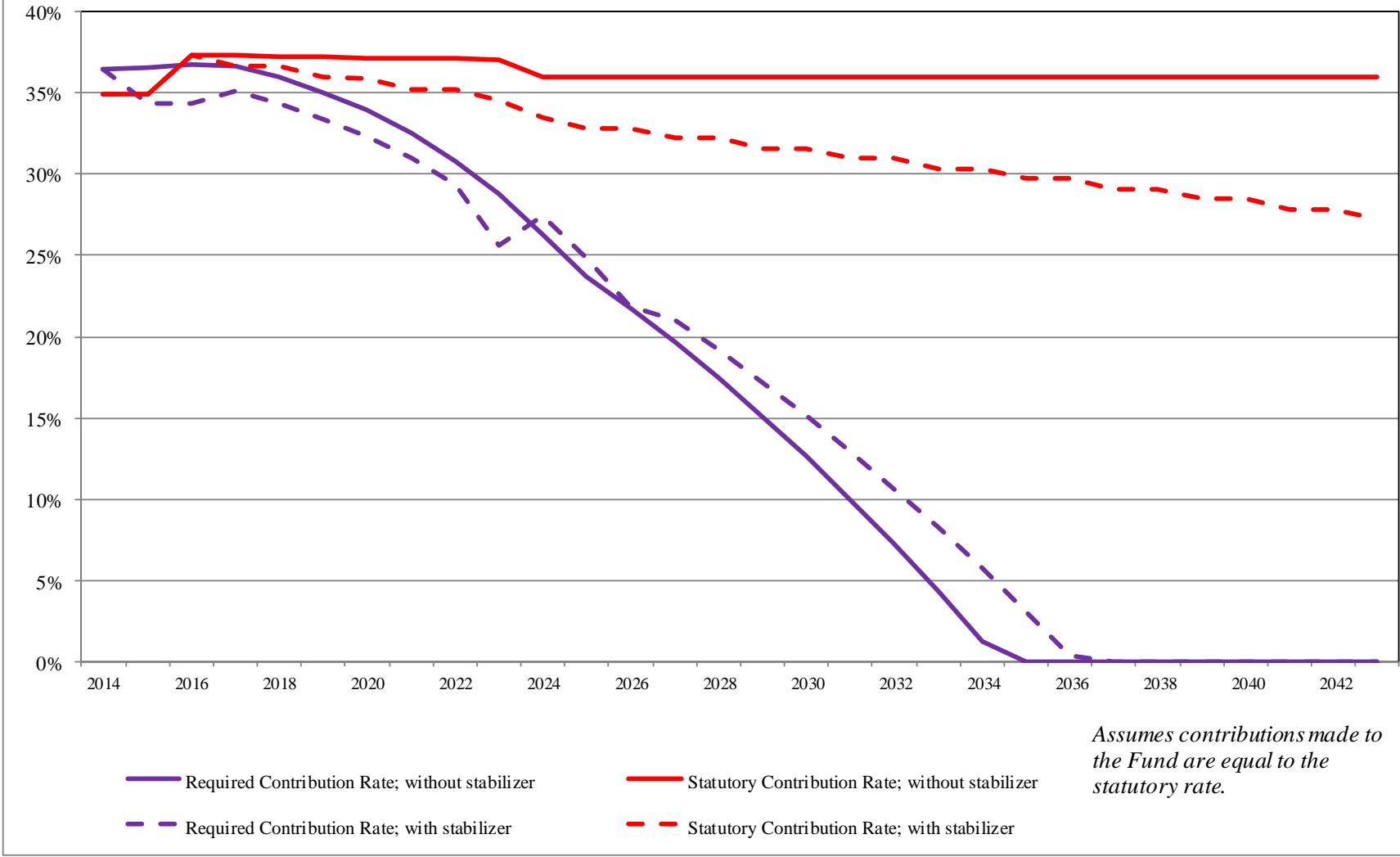
Investment Return of 8.0% for three years; 8.5% thereafter



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State Patrol Retirement Fund Estimated Contribution Rates

Investment Return of 9.5% for three years; 10.0% thereafter



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State Patrol Retirement Fund
Scenario: 6.5% for Three Years, 7.0% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 352B	35.0%	34.9%	37.4%	37.3%	37.3%	37.2%	37.2%	37.2%	37.1%	37.1%
Required - Chapter 356 (MVA)	36.5%	37.6%	38.8%	40.0%	40.8%	41.6%	42.4%	43.2%	44.0%	45.0%
Sufficiency / (Deficiency)	(1.5)%	(2.6)%	(1.5)%	(2.7)%	(3.5)%	(4.3)%	(5.2)%	(6.1)%	(6.9)%	(7.9)%
Contributions										
Statutory - Chapter 352B	23,575	24,400	26,983	27,921	28,905	29,974	31,071	32,269	33,542	34,803
Required - Chapter 356 (MVA)	24,579	26,229	28,036	29,927	31,627	33,449	35,418	37,540	39,812	42,256
Sufficiency / (Deficiency)	(1,004)	(1,829)	(1,053)	(2,006)	(2,722)	(3,475)	(4,347)	(5,271)	(6,270)	(7,453)
Funding Ratios										
Current Assets (MVA)	667,340	679,056	690,439	703,309	719,883	737,105	754,915	773,514	793,258	814,240
Actuarial Accrued Liability (AAL)	800,421	824,331	848,955	874,314	900,432	927,329	955,030	983,558	1,012,938	1,043,196
Unfunded AAL	133,081	145,275	158,516	171,005	180,549	190,224	200,115	210,044	219,680	228,956
Funding Ratio	83%	82%	81%	80%	80%	79%	79%	79%	78%	78%
Benefit Payments										
	54,084	55,963	57,818	59,302	60,774	62,434	63,965	65,308	66,712	68,387

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 6.5% for Three Years, 7.0% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 352B	37.0%	37.0%	37.0%	36.9%	36.9%	36.9%	36.8%	36.8%	36.8%	36.8%
Required - Chapter 356 (MVA)	46.1%	47.5%	49.1%	51.0%	53.3%	56.1%	59.7%	64.2%	70.3%	78.9%
Sufficiency / (Deficiency)	(9.1)%	(10.5)%	(12.1)%	(14.1)%	(16.4)%	(19.3)%	(22.8)%	(27.4)%	(33.5)%	(42.1)%
Contributions										
Statutory - Chapter 352B	36,081	37,326	38,610	39,937	41,291	42,727	44,242	45,833	47,454	49,160
Required - Chapter 356 (MVA)	44,931	47,905	51,268	55,132	59,658	65,057	71,648	79,918	90,723	105,540
Sufficiency / (Deficiency)	(8,850)	(10,579)	(12,658)	(15,195)	(18,367)	(22,330)	(27,406)	(34,085)	(43,269)	(56,380)
Funding Ratios										
Current Assets (MVA)	836,254	859,147	882,773	907,059	931,884	957,267	983,220	1,009,816	1,036,918	1,064,651
Actuarial Accrued Liability (AAL)	1,074,358	1,106,451	1,139,502	1,173,541	1,208,596	1,244,699	1,281,880	1,320,172	1,359,607	1,400,221
Unfunded AAL	238,104	247,304	256,729	266,482	276,712	287,432	298,660	310,356	322,689	335,570
Funding Ratio	78%	78%	77%	77%	77%	77%	77%	76%	76%	76%
Benefit Payments										
	70,296	72,374	74,610	77,049	79,535	82,127	84,768	87,658	90,492	93,120

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 6.5% for Three Years, 7.0% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Contributions (% of Payroll)										
Statutory - Chapter 352B	36.7%	36.7%	36.7%	36.6%	36.6%	36.6%	36.6%	36.6%	36.5%	36.5%
Required - Chapter 356 (MVA)	91.7%	112.9%	155.3%	282.3%	36.6%	36.6%	36.6%	36.7%	36.8%	36.9%
Sufficiency / (Deficiency)	(54.9)%	(76.2)%	(118.6)%	(245.7)%	0.1%	0.0%	(0.1)%	(0.1)%	(0.3)%	(0.4)%
Contributions										
Statutory - Chapter 352B	50,991	52,874	54,872	56,938	59,117	61,362	63,686	66,062	68,460	70,998
Required - Chapter 356 (MVA)	127,264	162,702	232,356	438,652	59,023	61,356	63,770	66,289	68,954	71,788
Sufficiency / (Deficiency)	(76,273)	(109,828)	(177,484)	(381,714)	94	6	(84)	(227)	(494)	(790)
Funding Ratios										
Current Assets (MVA)	1,093,359	1,123,255	1,154,433	1,187,056	1,221,361	1,257,507	1,295,374	1,334,752	1,375,215	1,416,664
Actuarial Accrued Liability (AAL)	1,442,048	1,485,124	1,529,487	1,575,175	1,622,228	1,670,686	1,720,592	1,771,989	1,824,921	1,879,434
Unfunded AAL	348,689	361,869	375,054	388,119	400,867	413,179	425,218	437,237	449,706	462,770
Funding Ratio	76%	76%	75%	75%	75%	75%	75%	75%	75%	75%
Benefit Payments										
	95,734	98,388	101,085	103,720	106,425	109,439	112,849	116,825	120,991	125,148

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 6.5% for Three Years, 7.0% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 352B	35.0%	34.9%	37.4%	38.0%	39.2%	39.7%	40.3%	40.9%	41.5%	42.1%
Required - Chapter 356 (MVA)	36.5%	37.6%	38.9%	40.1%	40.9%	41.6%	42.2%	42.8%	43.3%	43.8%
Sufficiency / (Deficiency)	(1.5)%	(2.7)%	(1.5)%	(2.2)%	(1.7)%	(1.8)%	(1.9)%	(1.9)%	(1.8)%	(1.7)%
Contributions										
Statutory - Chapter 352B	23,575	24,400	26,983	28,388	30,358	31,986	33,681	35,526	37,497	39,498
Required - Chapter 356 (MVA)	24,579	26,256	28,092	30,014	31,710	33,443	35,259	37,150	39,091	41,079
Sufficiency / (Deficiency)	(1,004)	(1,856)	(1,109)	(1,626)	(1,352)	(1,457)	(1,578)	(1,624)	(1,594)	(1,581)
Funding Ratios										
Current Assets (MVA)	667,340	679,056	690,439	703,309	720,367	739,127	759,161	780,759	804,381	830,235
Actuarial Accrued Liability (AAL)	800,421	824,331	848,955	874,314	900,432	927,329	955,030	983,558	1,012,938	1,043,196
Unfunded AAL	133,081	145,275	158,516	171,005	180,065	188,202	195,869	202,799	208,557	212,961
Funding Ratio	83%	82%	81%	80%	80%	80%	79%	79%	79%	80%
Benefit Payments										
	54,084	55,963	57,818	59,302	60,774	62,434	63,965	65,308	66,712	68,387

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 6.5% for Three Years, 7.0% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 352B	42.7%	43.2%	43.8%	44.4%	45.0%	46.2%	46.8%	48.1%	48.7%	49.9%
Required - Chapter 356 (MVA)	44.3%	44.9%	45.6%	46.3%	47.1%	48.0%	48.9%	50.0%	51.4%	53.1%
Sufficiency / (Deficiency)	(1.6)%	(1.7)%	(1.7)%	(1.8)%	(2.1)%	(1.7)%	(2.1)%	(2.0)%	(2.7)%	(3.3)%
Contributions										
Statutory - Chapter 352B	41,563	43,632	45,793	48,048	50,384	53,593	56,254	59,843	62,778	66,719
Required - Chapter 356 (MVA)	43,139	45,296	47,583	50,033	52,694	55,617	58,761	62,304	66,282	71,065
Sufficiency / (Deficiency)	(1,576)	(1,664)	(1,790)	(1,985)	(2,310)	(2,024)	(2,507)	(2,461)	(3,504)	(4,346)
Funding Ratios										
Current Assets (MVA)	858,228	888,332	920,528	954,891	991,460	1,030,425	1,072,746	1,118,041	1,167,219	1,219,932
Actuarial Accrued Liability (AAL)	1,074,358	1,106,451	1,139,502	1,173,541	1,208,596	1,244,699	1,281,880	1,320,172	1,359,607	1,400,221
Unfunded AAL	216,130	218,119	218,974	218,650	217,136	214,274	209,134	202,131	192,388	180,289
Funding Ratio	80%	80%	81%	81%	82%	83%	84%	85%	86%	87%
Benefit Payments										
	70,296	72,374	74,610	77,049	79,535	82,127	84,768	87,658	90,492	93,120

Numbers may not add due to rounding.

This exhibit should only be viewed in conjunction with GRS' January 30, 2015 letter to MSRS.

State Patrol Retirement Fund
Scenario: 6.5% for Three Years, 7.0% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Contributions (% of Payroll)										
Statutory - Chapter 352B	51.1%	52.9%	54.8%	56.6%	58.5%	58.5%	57.8%	57.8%	57.2%	57.1%
Required - Chapter 356 (MVA)	55.4%	58.7%	64.2%	79.1%	23.8%	21.8%	19.8%	17.7%	15.7%	13.6%
Sufficiency / (Deficiency)	(4.3)%	(5.7)%	(9.4)%	(22.4)%	34.7%	36.7%	38.0%	40.1%	41.5%	43.6%
Contributions										
Statutory - Chapter 352B	70,953	76,290	81,994	88,015	94,430	98,040	100,689	104,467	107,108	111,101
Required - Chapter 356 (MVA)	76,861	84,506	96,088	122,863	38,344	36,556	34,442	32,060	29,350	26,370
Sufficiency / (Deficiency)	(5,908)	(8,216)	(14,094)	(34,848)	56,086	61,484	66,247	72,407	77,758	84,731
Funding Ratios										
Current Assets (MVA)	1,277,683	1,341,142	1,411,807	1,490,519	1,578,231	1,675,908	1,781,024	1,892,696	2,011,963	2,137,986
Actuarial Accrued Liability (AAL)	1,442,048	1,485,124	1,529,487	1,575,175	1,622,228	1,670,686	1,720,592	1,771,989	1,824,921	1,879,434
Unfunded AAL	164,365	143,982	117,680	84,656	43,997	(5,222)	(60,432)	(120,707)	(187,042)	(258,552)
Funding Ratio	89%	90%	92%	95%	97%	100%	104%	107%	110%	114%
Benefit Payments										
	95,734	98,388	101,085	103,720	106,425	109,439	112,849	116,825	120,991	125,148

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 8.0% for Three Years, 8.5% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 352B	35.0%	34.9%	37.4%	37.3%	37.3%	37.2%	37.2%	37.1%	37.1%	37.1%
Required - Chapter 356 (MVA)	36.5%	38.0%	38.5%	38.9%	38.8%	38.9%	38.9%	38.9%	38.9%	38.9%
Sufficiency / (Deficiency)	(1.5)%	(3.0)%	(1.1)%	(1.5)%	(1.5)%	(1.6)%	(1.7)%	(1.7)%	(1.8)%	(1.9)%
Contributions										
Statutory - Chapter 352B	23,575	24,274	26,971	27,929	29,010	30,053	31,235	32,506	33,670	34,908
Required - Chapter 356 (MVA)	24,579	26,370	27,746	29,066	30,191	31,360	32,647	33,997	35,299	36,665
Sufficiency / (Deficiency)	(1,004)	(2,096)	(775)	(1,137)	(1,181)	(1,307)	(1,412)	(1,491)	(1,629)	(1,757)
Funding Ratios										
Current Assets (MVA)	667,340	688,836	710,820	735,433	765,059	796,199	829,001	863,878	901,290	941,275
Actuarial Accrued Liability (AAL)	800,421	831,489	859,383	888,286	918,525	950,161	983,160	1,017,831	1,054,550	1,093,408
Unfunded AAL	133,081	142,653	148,563	152,853	153,466	153,962	154,159	153,953	153,260	152,133
Funding Ratio	83%	83%	83%	83%	83%	84%	84%	85%	85%	86%
Benefit Payments										
	54,084	55,963	57,818	59,302	61,340	63,321	65,180	66,854	68,593	70,604

Numbers may not add due to rounding.

This exhibit should only be viewed in conjunction with GRS' January 30, 2015 letter to MSRS.

State Patrol Retirement Fund
Scenario: 8.0% for Three Years, 8.5% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 352B	37.0%	37.0%	37.0%	36.9%	36.9%	36.9%	36.8%	36.8%	36.0%	36.0%
Required - Chapter 356 (MVA)	39.0%	39.1%	39.2%	39.3%	39.4%	39.5%	39.7%	40.0%	40.4%	41.0%
Sufficiency / (Deficiency)	(2.0)%	(2.1)%	(2.2)%	(2.3)%	(2.5)%	(2.7)%	(2.9)%	(3.2)%	(4.4)%	(5.0)%
Contributions										
Statutory - Chapter 352B	36,101	37,301	38,621	39,913	41,314	42,782	44,324	45,883	46,585	48,364
Required - Chapter 356 (MVA)	38,007	39,398	40,910	42,442	44,102	45,874	47,799	49,875	52,217	55,083
Sufficiency / (Deficiency)	(1,906)	(2,097)	(2,289)	(2,529)	(2,788)	(3,092)	(3,475)	(3,992)	(5,632)	(6,719)
Funding Ratios										
Current Assets (MVA)	983,844	1,028,935	1,076,608	1,127,035	1,180,190	1,236,356	1,295,748	1,358,672	1,425,198	1,494,320
Actuarial Accrued Liability (AAL)	1,134,307	1,177,144	1,221,937	1,268,737	1,317,481	1,368,324	1,421,381	1,476,866	1,534,784	1,594,986
Unfunded AAL	150,463	148,209	145,329	141,702	137,291	131,968	125,633	118,194	109,586	100,666
Funding Ratio	87%	87%	88%	89%	90%	90%	91%	92%	93%	94%
Benefit Payments										
	72,842	75,234	77,790	80,570	83,406	86,350	89,337	92,561	96,186	100,072

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 8.0% for Three Years, 8.5% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Contributions (% of Payroll)										
Statutory - Chapter 352B	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%
Required - Chapter 356 (MVA)	42.0%	43.6%	47.0%	56.9%	25.1%	24.3%	23.5%	22.7%	21.8%	20.9%
Sufficiency / (Deficiency)	(6.0)%	(7.6)%	(11.0)%	(20.9)%	10.9%	11.7%	12.5%	13.4%	14.2%	15.1%
Contributions										
Statutory - Chapter 352B	50,171	52,094	54,095	56,216	58,349	60,570	62,832	65,109	67,568	70,140
Required - Chapter 356 (MVA)	58,519	63,145	70,563	88,920	40,686	40,905	40,998	40,959	40,863	40,644
Sufficiency / (Deficiency)	(8,348)	(11,051)	(16,468)	(32,704)	17,663	19,665	21,834	24,150	26,705	29,496
Funding Ratios										
Current Assets (MVA)	1,567,109	1,643,883	1,725,045	1,811,028	1,902,437	1,999,625	2,102,760	2,211,946	2,327,140	2,448,818
Actuarial Accrued Liability (AAL)	1,657,437	1,722,333	1,789,896	1,860,399	1,934,233	2,011,574	2,092,356	2,176,481	2,263,701	2,354,151
Unfunded AAL	90,328	78,450	64,851	49,371	31,796	11,949	(10,404)	(35,465)	(63,439)	(94,667)
Funding Ratio	95%	95%	96%	97%	98%	99%	100%	102%	103%	104%
Benefit Payments										
	103,980	107,942	111,923	115,836	119,865	124,290	129,144	134,546	140,161	145,753

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 8.0% for Three Years, 8.5% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 352B	35.0%	34.9%	37.4%	38.0%	38.5%	38.5%	38.4%	38.4%	38.4%	38.3%
Required - Chapter 356 (MVA)	36.5%	38.0%	38.5%	38.9%	38.8%	38.7%	38.6%	38.5%	38.4%	38.2%
Sufficiency / (Deficiency)	(1.5)%	(3.0)%	(1.1)%	(0.9)%	(0.2)%	(0.2)%	(0.2)%	(0.1)%	0.0%	0.1%
Contributions										
Statutory - Chapter 352B	23,575	24,274	26,971	28,397	29,983	31,062	32,285	33,600	34,804	36,085
Required - Chapter 356 (MVA)	24,579	26,370	27,746	29,066	30,153	31,237	32,421	33,649	34,804	35,992
Sufficiency / (Deficiency)	(1,004)	(2,096)	(775)	(669)	(170)	(175)	(136)	(49)	-	93
Funding Ratios										
Current Assets (MVA)	667,340	688,836	710,820	735,433	765,546	797,742	831,727	867,930	906,826	948,464
Actuarial Accrued Liability (AAL)	800,421	831,489	859,383	888,286	918,525	950,161	983,160	1,017,831	1,054,550	1,093,408
Unfunded AAL	133,081	142,653	148,563	152,853	152,979	152,419	151,433	149,901	147,724	144,944
Funding Ratio	83%	83%	83%	83%	83%	84%	85%	85%	86%	87%
Benefit Payments										
	54,084	55,963	57,818	59,302	61,340	63,321	65,180	66,854	68,593	70,604

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 8.0% for Three Years, 8.5% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 352B	38.3%	38.2%	38.2%	38.2%	38.1%	38.1%	38.1%	38.1%	37.3%	37.3%
Required - Chapter 356 (MVA)	38.1%	37.9%	37.7%	37.5%	37.3%	37.0%	36.6%	36.1%	35.4%	34.7%
Sufficiency / (Deficiency)	0.2%	0.3%	0.5%	0.6%	0.9%	1.2%	1.5%	2.0%	1.8%	2.6%
Contributions										
Statutory - Chapter 352B	37,320	38,562	39,927	41,264	42,713	44,232	45,828	47,441	48,203	50,043
Required - Chapter 356 (MVA)	37,120	38,251	39,443	40,581	41,748	42,893	44,007	45,004	45,866	46,605
Sufficiency / (Deficiency)	200	311	484	683	965	1,339	1,821	2,437	2,337	3,438
Funding Ratios										
Current Assets (MVA)	992,872	1,040,001	1,089,929	1,142,850	1,198,758	1,257,961	1,320,702	1,387,315	1,457,900	1,531,489
Actuarial Accrued Liability (AAL)	1,134,307	1,177,144	1,221,937	1,268,737	1,317,481	1,368,324	1,421,381	1,476,866	1,534,784	1,594,986
Unfunded AAL	141,435	137,143	132,008	125,887	118,723	110,363	100,679	89,551	76,884	63,497
Funding Ratio	88%	88%	89%	90%	91%	92%	93%	94%	95%	96%
Benefit Payments										
	72,842	75,234	77,790	80,570	83,406	86,350	89,337	92,561	96,186	100,072

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 8.0% for Three Years, 8.5% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Contributions (% of Payroll)										
Statutory - Chapter 352B	36.6%	36.6%	36.0%	36.0%	35.4%	35.4%	34.8%	34.8%	34.1%	34.1%
Required - Chapter 356 (MVA)	33.6%	31.9%	28.7%	23.7%	22.8%	21.9%	21.0%	20.2%	19.3%	18.3%
Sufficiency / (Deficiency)	3.1%	4.7%	7.3%	12.4%	12.6%	13.5%	13.7%	14.6%	14.9%	15.8%
Contributions										
Statutory - Chapter 352B	51,042	52,998	54,095	56,216	57,336	59,518	60,650	62,848	64,048	66,487
Required - Chapter 356 (MVA)	46,778	46,196	43,073	36,930	36,936	36,888	36,721	36,460	36,127	35,733
Sufficiency / (Deficiency)	4,264	6,802	11,022	19,286	20,400	22,630	23,929	26,388	27,921	30,754
Funding Ratios										
Current Assets (MVA)	1,609,188	1,690,447	1,776,510	1,866,867	1,963,022	2,064,303	2,171,841	2,284,624	2,403,638	2,528,150
Actuarial Accrued Liability (AAL)	1,657,437	1,722,333	1,789,896	1,860,399	1,934,233	2,011,574	2,092,356	2,176,481	2,263,701	2,354,151
Unfunded AAL	48,249	31,886	13,386	(6,468)	(28,789)	(52,729)	(79,485)	(108,143)	(139,937)	(173,999)
Funding Ratio	97%	98%	99%	100%	101%	103%	104%	105%	106%	107%
Benefit Payments										
	103,980	107,942	111,923	115,836	119,865	124,290	129,144	134,546	140,161	145,753

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 9.5% for Three Years, 10.0% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 352B	35.0%	34.9%	37.4%	37.3%	37.3%	37.2%	37.2%	37.2%	37.1%	37.1%
Required - Chapter 356 (MVA)	36.5%	36.6%	36.8%	36.7%	36.0%	35.1%	34.0%	32.6%	30.8%	28.8%
Sufficiency / (Deficiency)	(1.5)%	(1.7)%	0.6%	0.7%	1.3%	2.2%	3.2%	4.6%	6.3%	8.3%
Contributions										
Statutory - Chapter 352B	23,575	24,400	26,983	27,921	28,905	29,974	31,071	32,269	33,542	34,803
Required - Chapter 356 (MVA)	24,579	25,568	26,558	27,436	27,902	28,227	28,380	28,295	27,877	27,029
Sufficiency / (Deficiency)	(1,004)	(1,168)	425	485	1,003	1,747	2,691	3,974	5,665	7,774
Funding Ratios										
Current Assets (MVA)	667,340	698,616	731,753	768,797	812,386	859,509	910,403	965,599	1,025,830	1,091,615
Actuarial Accrued Liability (AAL)	800,421	832,297	865,443	899,908	935,747	973,012	1,011,761	1,052,054	1,093,951	1,137,517
Unfunded AAL	133,081	133,681	133,690	131,111	123,361	113,503	101,358	86,455	68,121	45,902
Funding Ratio	83%	84%	85%	85%	87%	88%	90%	92%	94%	96%
Benefit Payments										
	54,084	55,963	57,818	59,454	61,217	63,176	65,016	66,668	68,380	70,377

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 9.5% for Three Years, 10.0% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 352B	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%
Required - Chapter 356 (MVA)	26.3%	23.7%	21.7%	19.6%	17.4%	15.1%	12.6%	10.0%	7.3%	4.3%
Sufficiency / (Deficiency)	9.7%	12.3%	14.3%	16.4%	18.6%	20.9%	23.4%	26.0%	28.7%	31.7%
Contributions										
Statutory - Chapter 352B	35,081	36,326	37,610	38,937	40,291	41,727	43,242	44,833	46,454	48,160
Required - Chapter 356 (MVA)	25,655	23,907	22,708	21,227	19,512	17,499	15,168	12,451	9,362	5,788
Sufficiency / (Deficiency)	9,426	12,419	14,902	17,710	20,779	24,228	28,074	32,382	37,092	42,372
Funding Ratios										
Current Assets (MVA)	1,163,198	1,239,469	1,321,351	1,409,246	1,503,532	1,604,801	1,713,696	1,830,965	1,957,172	2,093,283
Actuarial Accrued Liability (AAL)	1,182,818	1,230,331	1,279,388	1,329,984	1,381,936	1,435,339	1,490,246	1,546,742	1,604,611	1,664,081
Unfunded AAL	19,620	(9,138)	(41,963)	(79,262)	(121,596)	(169,462)	(223,450)	(284,223)	(352,561)	(429,202)
Funding Ratio	98%	101%	103%	106%	109%	112%	115%	118%	122%	126%
Benefit Payments										
	72,999	76,155	79,503	83,105	86,781	90,589	94,490	98,727	102,925	106,884

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 9.5% for Three Years, 10.0% thereafter WITHOUT CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Contributions (% of Payroll)										
Statutory - Chapter 352B	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%
Required - Chapter 356 (MVA)	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sufficiency / (Deficiency)	34.8%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%
Contributions										
Statutory - Chapter 352B	49,991	51,874	53,872	55,938	58,117	60,362	62,686	65,062	67,460	69,998
Required - Chapter 356 (MVA)	1,671	-	-	-	-	-	-	-	-	-
Sufficiency / (Deficiency)	48,320	51,874	53,872	55,938	58,117	60,362	62,686	65,062	67,460	69,998
Funding Ratios										
Current Assets (MVA)	2,240,629	2,400,518	2,574,225	2,763,179	2,969,049	3,193,550	3,438,255	3,704,774	3,994,662	4,310,010
Actuarial Accrued Liability (AAL)	1,725,645	1,789,622	1,856,271	1,925,816	1,998,650	2,074,991	2,154,823	2,237,982	2,324,083	2,413,188
Unfunded AAL	(514,984)	(610,896)	(717,954)	(837,363)	(970,399)	(1,118,559)	(1,283,432)	(1,466,792)	(1,670,579)	(1,896,822)
Funding Ratio	130%	134%	139%	143%	149%	154%	160%	166%	172%	179%
Benefit Payments										
	110,790	114,728	118,735	122,674	126,701	131,072	135,911	141,398	147,141	152,909

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 9.5% for Three Years, 10.0% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 352B	35.0%	34.9%	37.4%	36.7%	36.7%	36.0%	36.0%	35.3%	35.2%	34.6%
Required - Chapter 356 (MVA)	36.5%	34.4%	34.4%	35.2%	34.4%	33.4%	32.3%	31.0%	29.4%	25.6%
Sufficiency / (Deficiency)	(1.5)%	0.6%	3.0%	1.6%	2.3%	2.6%	3.6%	4.3%	5.9%	9.0%
Contributions										
Statutory - Chapter 352B	23,575	24,400	26,983	27,453	28,420	28,968	30,027	30,640	31,847	32,456
Required - Chapter 356 (MVA)	24,579	24,005	24,802	26,285	26,650	26,865	27,014	26,954	26,539	24,023
Sufficiency / (Deficiency)	(1,004)	395	2,181	1,168	1,770	2,103	3,013	3,686	5,308	8,433
Funding Ratios										
Current Assets (MVA)	667,340	698,616	731,753	768,797	811,895	858,460	908,193	962,072	1,020,241	1,083,687
Actuarial Accrued Liability (AAL)	800,421	832,297	865,443	899,908	935,747	973,012	1,011,761	1,052,054	1,093,951	1,137,517
Unfunded AAL	133,081	133,681	133,690	131,111	123,852	114,552	103,568	89,982	73,710	53,830
Funding Ratio	83%	84%	85%	85%	87%	88%	90%	91%	93%	95%
Benefit Payments										
	54,084	55,963	57,818	59,454	61,217	63,176	65,016	66,668	68,380	70,377

Numbers may not add due to rounding.

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State Patrol Retirement Fund
Scenario: 9.5% for Three Years, 10.0% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 352B	33.5%	32.9%	32.9%	32.3%	32.3%	31.6%	31.6%	31.0%	31.0%	30.4%
Required - Chapter 356 (MVA)	27.5%	24.8%	21.9%	21.1%	19.2%	17.2%	15.1%	12.9%	10.7%	8.3%
Sufficiency / (Deficiency)	6.1%	8.0%	11.0%	11.2%	13.1%	14.4%	16.5%	18.1%	20.3%	22.1%
Contributions										
Statutory - Chapter 352B	32,645	33,172	34,345	34,881	36,094	36,656	37,987	38,606	40,002	40,635
Required - Chapter 356 (MVA)	26,754	25,066	22,851	22,778	21,481	19,939	18,182	16,107	13,789	11,076
Sufficiency / (Deficiency)	5,891	8,106	11,494	12,103	14,613	16,717	19,805	22,499	26,213	29,559
Funding Ratios										
Current Assets (MVA)	1,152,012	1,224,606	1,301,691	1,384,192	1,471,715	1,565,395	1,665,024	1,771,909	1,885,672	2,007,859
Actuarial Accrued Liability (AAL)	1,182,818	1,230,331	1,279,388	1,329,984	1,381,936	1,435,339	1,490,246	1,546,742	1,604,611	1,664,081
Unfunded AAL	30,806	5,725	(22,303)	(54,208)	(89,779)	(130,056)	(174,778)	(225,167)	(281,061)	(343,778)
Funding Ratio	97%	100%	102%	104%	106%	109%	112%	115%	118%	121%
Benefit Payments										
	72,999	76,155	79,503	83,105	86,781	90,589	94,490	98,727	102,925	106,884

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State Patrol Retirement Fund
Scenario: 9.5% for Three Years, 10.0% thereafter WITH CONTRIBUTION STABILIZER
Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Contributions (% of Payroll)										
Statutory - Chapter 352B	30.4%	29.8%	29.8%	29.1%	29.1%	28.5%	28.5%	27.9%	27.9%	27.3%
Required - Chapter 356 (MVA)	5.7%	3.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sufficiency / (Deficiency)	24.6%	26.7%	29.4%	29.1%	29.1%	28.5%	28.5%	27.9%	27.9%	27.3%
Contributions										
Statutory - Chapter 352B	42,180	42,868	44,519	45,255	47,018	47,786	49,627	50,378	52,234	52,985
Required - Chapter 356 (MVA)	7,978	4,453	472	-	-	-	-	-	-	-
Sufficiency / (Deficiency)	34,202	38,415	44,047	45,255	47,018	47,786	49,627	50,378	52,234	52,985
Funding Ratios										
Current Assets (MVA)	2,138,760	2,280,260	2,432,485	2,597,446	2,775,525	2,969,021	3,178,068	3,404,856	3,649,334	3,914,163
Actuarial Accrued Liability (AAL)	1,725,645	1,789,622	1,856,271	1,925,816	1,998,650	2,074,991	2,154,823	2,237,982	2,324,083	2,413,188
Unfunded AAL	(413,115)	(490,638)	(576,214)	(671,630)	(776,875)	(894,030)	(1,023,245)	(1,166,874)	(1,325,251)	(1,500,975)
Funding Ratio	124%	127%	131%	135%	139%	143%	147%	152%	157%	162%
Benefit Payments										
	110,790	114,728	118,735	122,674	126,701	131,072	135,911	141,398	147,141	152,909