

January 31, 2013

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 – Correctional Fund

Dear Dave:

Attached are 30-year projections of estimated funded status, required contributions, and statutory contributions under three asset return scenarios for the Correctional Employees Retirement Fund (CERF). The estimates are based on participant data, assumptions, methods, and plan provisions as of July 1, 2012 as detailed in the Correctional Employees Retirement Fund Actuarial Valuation Report as of July 1, 2012.

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 5-year select and ultimate approach with rates of 8.0% for the period July 1, 2012 to 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 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.

The estimates are based on the market value of assets with no smoothing of investment gains or losses. Payroll is assumed to increase 3.75% a year, consistent with the valuation assumption for total payroll growth. In all scenarios, the valuation interest rate used to discount liabilities was the single effective interest rate used in the July 1, 2012 valuation of 8.36%, 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.

Normal cost is assumed to trend downward as a percent of payroll to a level ultimate rate that reflects the expiration of the 5-year select period on June 30, 2017 and the post-2010 plan provisions for new members.

Benefit payments are based on the assumptions and methods described in this letter, with adjustments applied to estimate the impact of future members hired after June 30, 2012 retiring during the 30-year projection period. To estimate this impact, we assumed total benefit payments would increase a minimum of 3.5% per year.

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
6.5%/7.0%	27.7%
8.0%/8.5%	27.2%
9.5%/10.0%	22.7%

Some of these rates are significantly higher than the current rate of 20.7% and may not be sustainable. Lower contributions would result in markedly different projections.

In years of a contribution increase or decrease, employer and employee contribution rates were assumed to increase equally at 0.25% of pay each.

Postretirement 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 90% (on a market value of assets basis) in the future, postretirement increases will revert to the 2.5% level.

Under the 7.0% ultimate rate of return scenario, the funded status of the plan is expected to deteriorate. Under the 8.5% ultimate rate of return scenario (without contribution stabilizer), the funded status of the plan is expected to slowly improve. We assumed a 2.0% postretirement benefit increase for all years for these two scenarios. If the postretirement benefit increase was assumed to be 2.5% instead of 2.0%, the liabilities would be significantly greater than the liabilities shown in this report.

Under the 8.5% (with contribution stabilizer), 10.0% (without and with contribution stabilizer) ultimate rate of return scenario, assuming all future postretirement benefit increases equal 2.0%, the funded status of the plan is expected to exceed 90% in approximately the year 2035, 2025 and 2024, respectively. However, if at that time future postretirement increases are assumed to be 2.5%, the funded ratio would be less than 90%. If the plan continued to pay postretirement increases of 2.0% per year, our projections indicate that the plan would reach a funding status of 90% (assuming future postretirement increases of 2.5%) around the year 2037, 2026 and 2025, respectively. Without further guidance, we cannot determine the date the postretirement increase would change to 2.5% and have not shown values for these scenarios beyond these years. Different results would be obtained if our projected liabilities for years prior to 2035/2025/2024 anticipated a switch to the 2.5% COLA in the year 2037/2026/2025.

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.

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.

Mr. Dave Bergstrom
January 31, 2013
Page 4

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.

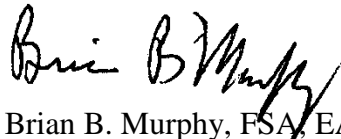
The undersigned actuaries are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. In addition, Mr. Murphy meets the requirements of "approved actuary" under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

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:sc
Enclosures

Exhibit A

Correctional Employees Retirement Fund Contribution Stabilizer

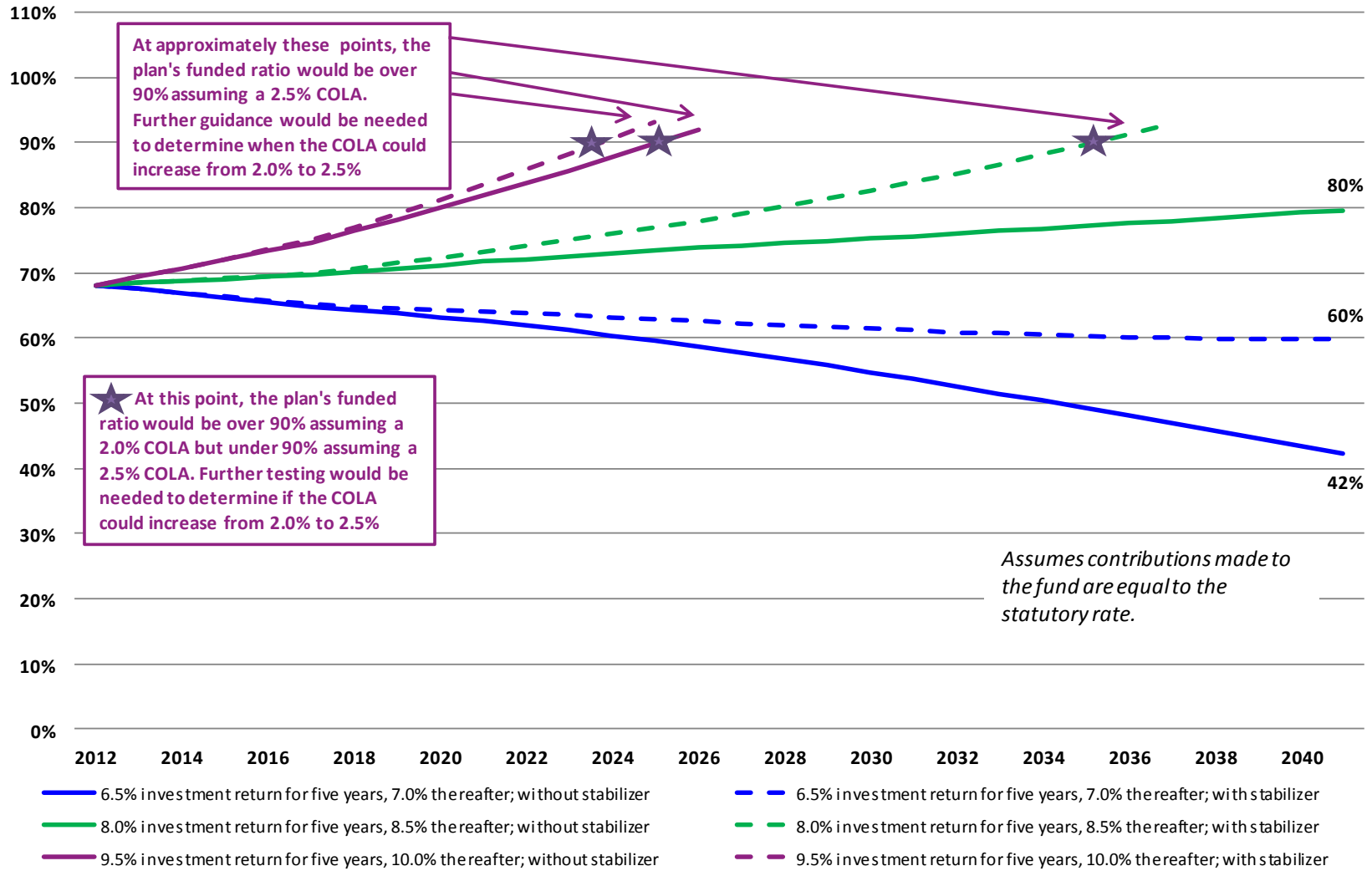
The following is a summary of Minnesota Statute 352.045:

- If a contribution sufficiency of at least 0.5% has existed for two consecutive years (after July 1, 2011), the member and employer contribution rates are decreased by at most 0.25% each to a level that is necessary to maintain a 0.25% sufficiency.
- If a contribution deficiency of at least 0.5% has existed for two consecutive years (after July 1, 2011), the member and employer contribution rates are increased by at most 0.25% each.
- A contribution rate adjustment under this section must not be made until at least two years have passed since fully implementing a previous adjustment.

This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS.

Correctional Employees Retirement Fund Projection of Funded Status

Assumes postretirement increases of 2.0% for all years

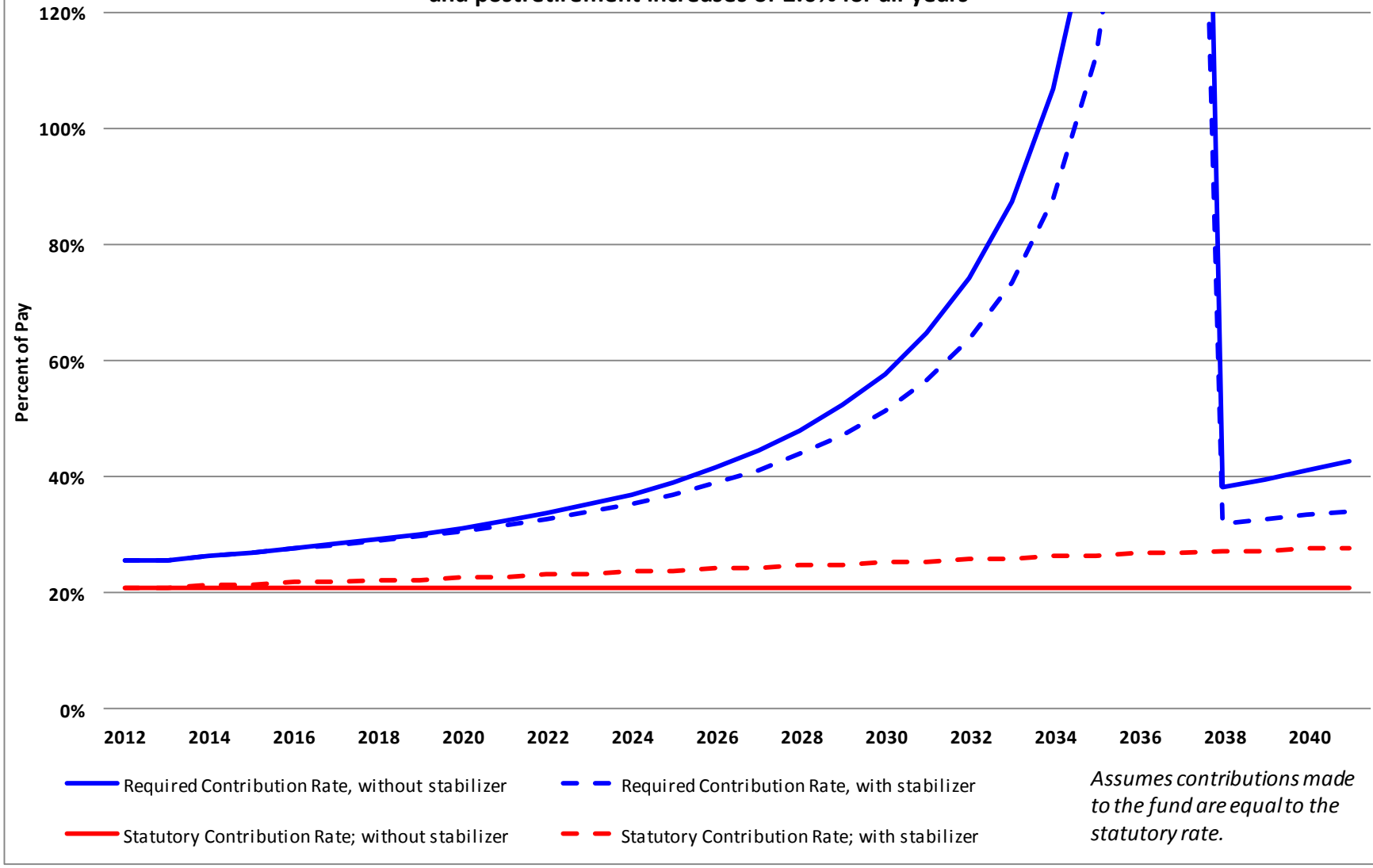


This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS.

Correctional Employees Retirement Fund Estimated Contribution Rates

Assumes 6.5% investment return for five years, 7.0% thereafter and postretirement increases of 2.0% for all years

Rates briefly exceed 120% of payroll at the end of the projection period. For details, refer to attached exhibits.

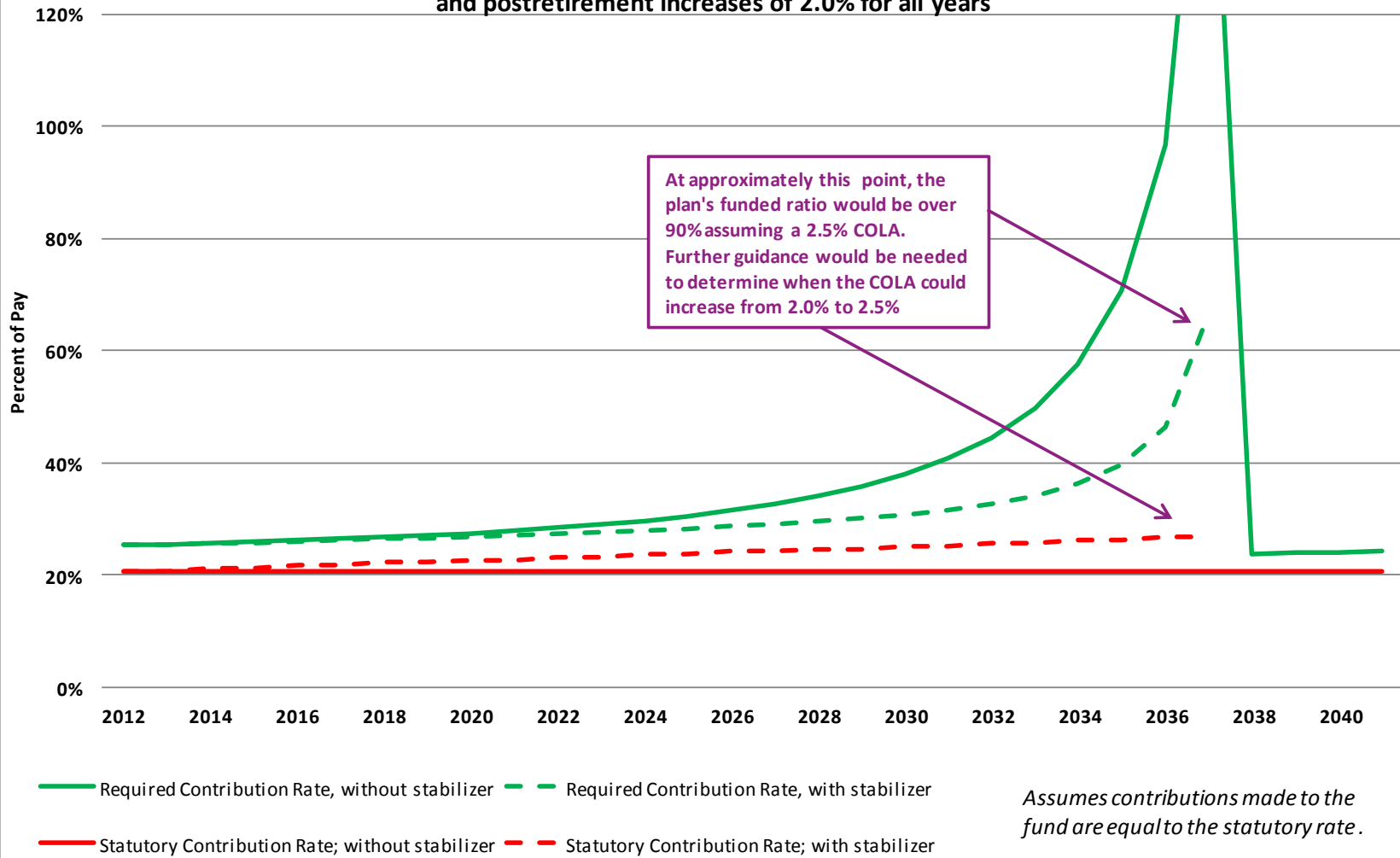


This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS.

Correctional Employees Retirement Fund Estimated Contribution Rates

Assumes 8.0% for five years, 8.5% investment return thereafter and postretirement increases of 2.0% for all years

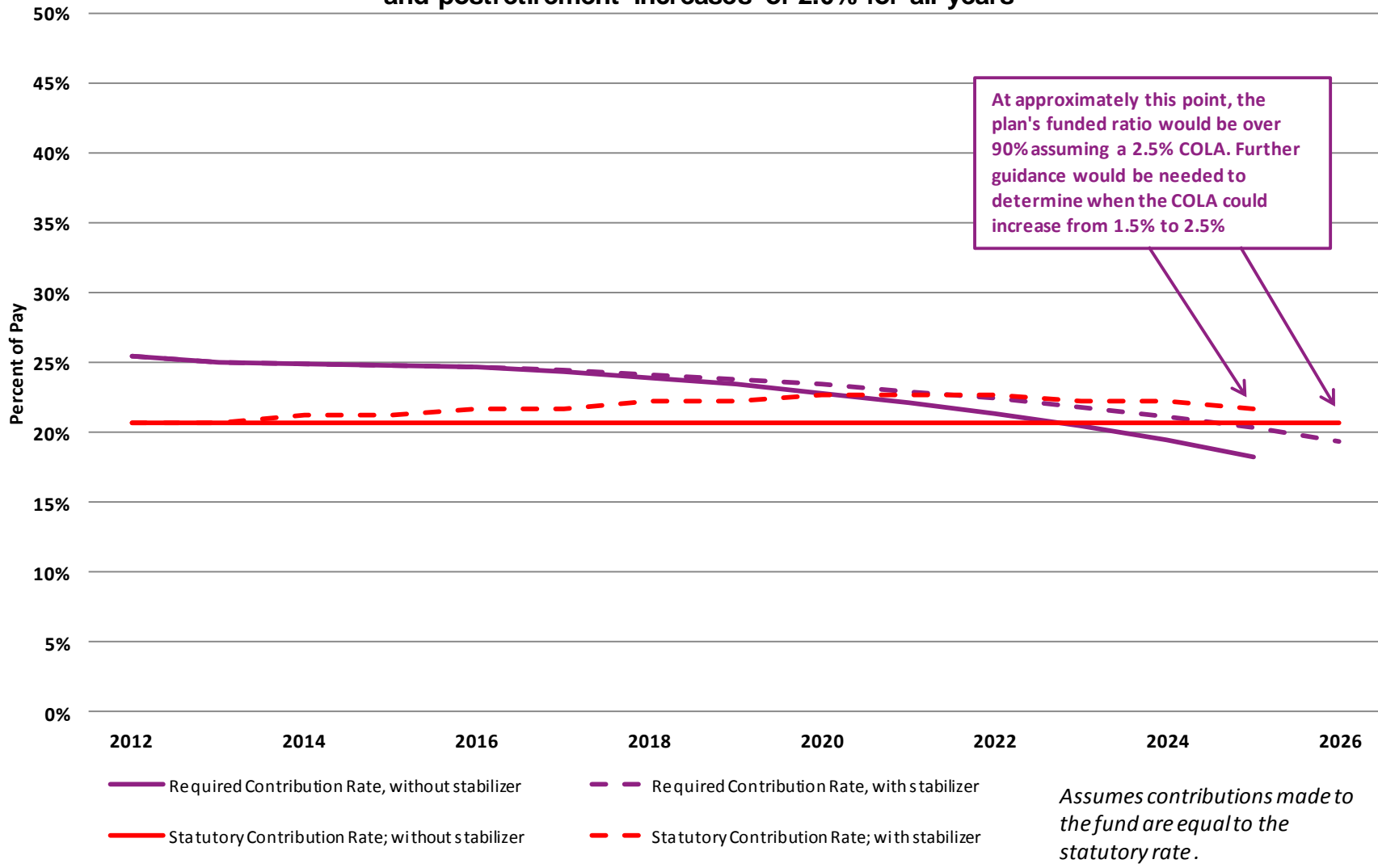
Rates briefly exceed 120% of payroll at the end of the projection period. For details, refer to attached exhibits.



This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS.

Correctional Employees Retirement Fund Estimated Contribution Rates

Assumes 9.5% investment return for five years, 10.0% thereafter
and postretirement increases of 2.0% for all years



This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 6.5% for Five Years, 7.0% thereafter; without contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%
Required - Chapter 356	25.4%	25.6%	26.2%	26.8%	27.6%	28.3%	29.1%	30.0%	31.0%	32.2%
Sufficiency / (Deficiency)	(4.7)%	(4.9)%	(5.5)%	(6.1)%	(6.9)%	(7.6)%	(8.4)%	(9.3)%	(10.3)%	(11.5)%
Contributions										
Statutory - Chapter 352.92	43,896	45,542	47,249	49,021	50,860	52,767	54,746	56,799	58,929	61,138
Required - Chapter 356	53,876	56,374	59,778	63,580	67,799	72,249	77,028	82,374	88,389	95,167
Sufficiency / (Deficiency)	(9,980)	(10,832)	(12,529)	(14,559)	(16,939)	(19,482)	(22,282)	(25,575)	(29,460)	(34,029)
Funding Ratios										
Current Assets (MVA)	659,523	697,765	736,945	776,427	816,160	856,290	900,870	946,049	991,560	1,036,959
Actuarial Accrued Liability (AAL)	968,166	1,033,891	1,102,010	1,172,645	1,245,944	1,322,229	1,401,165	1,483,209	1,568,309	1,656,263
Unfunded AAL	308,643	336,126	365,065	396,217	429,783	465,939	500,295	537,160	576,750	619,304
Funding Ratio	68%	67%	67%	66%	66%	65%	64%	64%	63%	63%
Benefit Payments										
	47,804	50,928	54,788	58,779	62,711	66,919	71,309	76,070	81,358	86,982

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed
in conjunction with GRS' January
31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 6.5% for Five Years, 7.0% thereafter; without contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%
Required - Chapter 356	33.6%	35.1%	36.9%	39.0%	41.5%	44.4%	48.0%	52.3%	57.8%	64.8%
Sufficiency / (Deficiency)	(12.9)%	(14.4)%	(16.2)%	(18.3)%	(20.8)%	(23.7)%	(27.3)%	(31.6)%	(37.1)%	(44.1)%
Contributions										
Statutory - Chapter 352.92	63,431	65,810	68,278	70,838	73,494	76,250	79,110	82,076	85,154	88,348
Required - Chapter 356	102,866	111,670	121,796	133,542	147,317	163,664	183,336	207,433	237,604	276,446
Sufficiency / (Deficiency)	(39,435)	(45,860)	(53,518)	(62,704)	(73,823)	(87,414)	(104,226)	(125,357)	(152,450)	(188,098)
Funding Ratios										
Current Assets (MVA)	1,081,972	1,126,515	1,170,563	1,214,495	1,258,200	1,301,450	1,344,403	1,387,550	1,430,963	1,474,749
Actuarial Accrued Liability (AAL)	1,747,028	1,840,788	1,937,812	2,038,788	2,143,934	2,253,390	2,367,707	2,487,796	2,614,183	2,747,467
Unfunded AAL	665,056	714,273	767,249	824,293	885,734	951,940	1,023,304	1,100,246	1,183,220	1,272,718
Funding Ratio	62%	61%	60%	60%	59%	58%	57%	56%	55%	54%
Benefit Payments										
	92,744	98,583	104,109	109,827	115,843	121,776	127,315	132,905	138,519	144,193

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed
in conjunction with GRS' January 31,
2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 6.5% for Five Years, 7.0% thereafter; without contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%
Required - Chapter 356	74.1%	87.3%	107.0%	139.8%	205.6%	402.9%	38.2%	39.5%	41.0%	42.6%
Sufficiency / (Deficiency)	(53.4)%	(66.6)%	(86.3)%	(119.1)%	(184.9)%	(382.2)%	(17.5)%	(18.8)%	(20.3)%	(21.9)%
Contributions										
Statutory - Chapter 352.92	91,661	95,098	98,664	102,364	106,203	110,185	114,317	118,604	123,052	127,666
Required - Chapter 356	328,284	400,897	509,862	691,510	1,054,821	2,144,729	210,737	226,419	243,595	262,444
Sufficiency / (Deficiency)	(236,623)	(305,799)	(411,198)	(589,146)	(948,618)	(2,034,544)	(96,420)	(107,815)	(120,543)	(134,778)
Funding Ratios										
Current Assets (MVA)	1,518,988	1,563,942	1,609,943	1,657,009	1,705,059	1,754,067	1,804,315	1,855,823	1,908,610	1,962,696
Actuarial Accrued Liability (AAL)	2,888,264	3,037,415	3,195,880	3,364,363	3,543,529	3,734,147	3,937,361	4,154,116	4,385,428	4,632,381
Unfunded AAL	1,369,276	1,473,473	1,585,937	1,707,354	1,838,470	1,980,080	2,133,046	2,298,293	2,476,818	2,669,685
Funding Ratio	53%	51%	50%	49%	48%	47%	46%	45%	44%	42%
Benefit Payments	149,765	155,186	160,788	166,671	172,785	178,832	185,091	191,569	198,274	205,214

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 6.5% for Five Years, 7.0% thereafter; with contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	21.2%	21.2%	21.7%	21.7%	22.2%	22.2%	22.7%	22.7%
Required - Chapter 356	25.4%	25.6%	26.2%	26.8%	27.5%	28.2%	28.9%	29.6%	30.5%	31.5%
Sufficiency / (Deficiency)	(4.7)%	(4.9)%	(5.0)%	(5.6)%	(5.8)%	(6.5)%	(6.7)%	(7.4)%	(7.8)%	(8.8)%
Contributions										
Statutory - Chapter 352.92	43,896	45,542	48,391	50,205	53,317	55,316	58,713	60,914	64,622	67,045
Required - Chapter 356	53,876	56,374	59,778	63,497	67,619	71,861	76,396	81,347	86,899	93,006
Sufficiency / (Deficiency)	(9,980)	(10,832)	(11,387)	(13,292)	(14,302)	(16,545)	(17,683)	(20,433)	(22,277)	(25,961)
Funding Ratios										
Current Assets (MVA)	659,523	697,765	736,945	777,606	818,638	861,465	909,046	958,904	1,009,574	1,062,127
Actuarial Accrued Liability (AAL)	968,166	1,033,891	1,102,010	1,172,645	1,245,944	1,322,229	1,401,165	1,483,209	1,568,309	1,656,263
Unfunded AAL	308,643	336,126	365,065	395,039	427,306	460,764	492,119	524,305	558,736	594,136
Funding Ratio	68%	67%	67%	66%	66%	65%	65%	65%	64%	64%
Benefit Payments										
	47,804	50,928	54,788	58,779	62,711	66,919	71,309	76,070	81,358	86,982

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed
in conjunction with GRS' January
31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 6.5% for Five Years, 7.0% thereafter; with contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Contributions (% of Payroll)										
Statutory - Chapter 352.92	23.2%	23.2%	23.7%	23.7%	24.2%	24.2%	24.7%	24.7%	25.2%	25.2%
Required - Chapter 356	32.6%	33.9%	35.3%	36.9%	38.9%	41.1%	43.9%	47.2%	51.3%	56.6%
Sufficiency / (Deficiency)	(9.4)%	(10.7)%	(11.6)%	(13.2)%	(14.7)%	(16.9)%	(19.2)%	(22.5)%	(26.1)%	(31.4)%
Contributions										
Statutory - Chapter 352.92	71,092	73,758	78,173	81,104	85,921	89,143	94,397	97,937	103,666	107,554
Required - Chapter 356	99,910	107,621	116,438	126,429	138,068	151,574	167,705	187,050	211,082	241,433
Sufficiency / (Deficiency)	(28,818)	(33,863)	(38,265)	(45,325)	(52,147)	(62,431)	(73,308)	(89,113)	(107,416)	(133,879)
Funding Ratios										
Current Assets (MVA)	1,115,016	1,169,801	1,225,104	1,283,096	1,342,228	1,404,223	1,467,713	1,535,314	1,605,486	1,680,648
Actuarial Accrued Liability (AAL)	1,747,028	1,840,788	1,937,812	2,038,788	2,143,934	2,253,390	2,367,707	2,487,796	2,614,183	2,747,467
Unfunded AAL	632,012	670,987	712,707	755,692	801,705	849,168	899,994	952,482	1,008,697	1,066,819
Funding Ratio	64%	64%	63%	63%	63%	62%	62%	62%	61%	61%
Benefit Payments	92,744	98,583	104,109	109,827	115,843	121,776	127,315	132,905	138,519	144,193

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed
in conjunction with GRS' January 31,
2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 6.5% for Five Years, 7.0% thereafter; with contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Contributions (% of Payroll)										
Statutory - Chapter 352.92	25.7%	25.7%	26.2%	26.2%	26.7%	26.7%	27.2%	27.2%	27.7%	27.7%
Required - Chapter 356	63.6%	73.4%	88.0%	112.4%	161.1%	306.9%	31.9%	32.6%	33.3%	34.0%
Sufficiency / (Deficiency)	(37.9)%	(47.7)%	(61.8)%	(86.2)%	(134.4)%	(280.2)%	(4.7)%	(5.4)%	(5.6)%	(6.3)%
Contributions										
Statutory - Chapter 352.92	113,801	118,068	124,879	129,562	136,986	142,123	150,214	155,847	164,663	170,838
Required - Chapter 356	281,637	337,047	419,656	555,714	826,567	1,633,667	176,293	186,620	197,797	209,718
Sufficiency / (Deficiency)	(167,836)	(218,979)	(294,777)	(426,152)	(689,581)	(1,491,544)	(26,079)	(30,773)	(33,134)	(38,880)
Funding Ratios										
Current Assets (MVA)	1,759,179	1,843,861	1,933,230	2,030,059	2,132,373	2,243,154	2,360,694	2,488,301	2,623,908	2,771,133
Actuarial Accrued Liability (AAL)	2,888,264	3,037,415	3,195,880	3,364,363	3,543,529	3,734,147	3,937,361	4,154,116	4,385,428	4,632,381
Unfunded AAL	1,129,085	1,193,555	1,262,649	1,334,304	1,411,156	1,490,993	1,576,667	1,665,815	1,761,520	1,861,248
Funding Ratio	61%	61%	60%	60%	60%	60%	60%	60%	60%	60%
Benefit Payments										
	149,765	155,186	160,788	166,671	172,785	178,832	185,091	191,569	198,274	205,214

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed
in conjunction with GRS' January
31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 8.0% for Five Years, 8.5% thereafter; without contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%
Required - Chapter 356	25.4%	25.3%	25.6%	25.8%	26.2%	26.5%	26.7%	27.0%	27.4%	27.8%
Sufficiency / (Deficiency)	(4.7)%	(4.6)%	(4.9)%	(5.1)%	(5.5)%	(5.8)%	(6.0)%	(6.3)%	(6.7)%	(7.1)%
Contributions										
Statutory - Chapter 352.92	43,896	45,542	47,249	49,021	50,860	52,767	54,746	56,799	58,929	61,138
Required - Chapter 356	53,876	55,716	58,334	61,203	64,315	67,444	70,673	74,184	78,028	82,232
Sufficiency / (Deficiency)	(9,980)	(10,174)	(11,085)	(12,182)	(13,455)	(14,677)	(15,927)	(17,385)	(19,099)	(21,094)
Funding Ratios										
Current Assets (MVA)	659,523	707,624	758,015	810,176	864,177	920,296	983,050	1,048,598	1,116,865	1,187,615
Actuarial Accrued Liability (AAL)	968,166	1,033,891	1,102,010	1,172,645	1,245,944	1,322,229	1,401,165	1,483,209	1,568,309	1,656,263
Unfunded AAL	308,643	326,267	343,995	362,469	381,767	401,933	418,115	434,611	451,444	468,647
Funding Ratio	68%	68%	69%	69%	69%	70%	70%	71%	71%	72%
Benefit Payments	47,804	50,928	54,788	58,779	62,711	66,919	71,309	76,070	81,358	86,982

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 8.0% for Five Years, 8.5% thereafter; without contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%
Required - Chapter 356	28.3%	28.9%	29.6%	30.5%	31.4%	32.6%	34.0%	35.7%	37.9%	40.7%
Sufficiency / (Deficiency)	(7.6)%	(8.2)%	(8.9)%	(9.8)%	(10.7)%	(11.9)%	(13.3)%	(15.0)%	(17.2)%	(20.0)%
Contributions										
Statutory - Chapter 352.92	63,431	65,810	68,278	70,838	73,494	76,250	79,110	82,076	85,154	88,348
Required - Chapter 356	86,871	92,025	97,775	104,242	111,597	120,060	129,927	141,640	155,858	173,620
Sufficiency / (Deficiency)	(23,440)	(26,215)	(29,497)	(33,404)	(38,103)	(43,810)	(50,817)	(59,564)	(70,704)	(85,272)
Funding Ratios										
Current Assets (MVA)	1,260,789	1,336,535	1,415,080	1,497,079	1,582,721	1,672,104	1,765,736	1,864,493	1,968,870	2,079,433
Actuarial Accrued Liability (AAL)	1,747,028	1,840,788	1,937,812	2,038,788	2,143,934	2,253,390	2,367,707	2,487,796	2,614,183	2,747,467
Unfunded AAL	486,239	504,253	522,732	541,709	561,213	581,286	601,972	623,303	645,313	668,034
Funding Ratio	72%	73%	73%	73%	74%	74%	75%	75%	75%	76%
Benefit Payments	92,744	98,583	104,109	109,827	115,843	121,776	127,315	132,905	138,519	144,193

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 8.0% for Five Years, 8.5% thereafter; without contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%
Required - Chapter 356	44.4%	49.6%	57.5%	70.6%	96.8%	175.4%	23.8%	23.9%	24.1%	24.3%
Sufficiency / (Deficiency)	(23.7)%	(28.9)%	(36.8)%	(49.9)%	(76.1)%	(154.7)%	(3.1)%	(3.2)%	(3.4)%	(3.6)%
Contributions										
Statutory - Chapter 352.92	91,661	95,098	98,664	102,364	106,203	110,185	114,317	118,604	123,052	127,666
Required - Chapter 356	196,653	228,057	274,046	349,102	496,646	933,811	131,301	137,145	143,291	149,756
Sufficiency / (Deficiency)	(104,992)	(132,959)	(175,382)	(246,738)	(390,443)	(823,626)	(16,984)	(18,541)	(20,239)	(22,090)
Funding Ratios										
Current Assets (MVA)	2,196,765	2,321,670	2,455,076	2,597,652	2,750,020	2,912,916	3,087,452	3,274,549	3,475,206	3,690,506
Actuarial Accrued Liability (AAL)	2,888,264	3,037,415	3,195,880	3,364,363	3,543,529	3,734,147	3,937,361	4,154,116	4,385,428	4,632,381
Unfunded AAL	691,499	715,746	740,803	766,710	793,509	821,231	849,909	879,567	910,222	941,875
Funding Ratio	76%	76%	77%	77%	78%	78%	78%	79%	79%	80%
Benefit Payments										
	149,765	155,186	160,788	166,671	172,785	178,832	185,091	191,569	198,274	205,214

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

This exhibit should only be viewed
in conjunction with GRS' January
31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 8.0% for Five Years, 8.5% thereafter; with contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	21.2%	21.2%	21.7%	21.7%	22.2%	22.2%	22.7%	22.7%
Required - Chapter 356	25.4%	25.3%	25.6%	25.8%	26.1%	26.3%	26.5%	26.7%	26.9%	27.1%
Sufficiency / (Deficiency)	(4.7)%	(4.6)%	(4.4)%	(4.6)%	(4.4)%	(4.6)%	(4.3)%	(4.5)%	(4.2)%	(4.4)%
Contributions										
Statutory - Chapter 352.92	43,896	45,542	48,391	50,205	53,317	55,316	58,713	60,914	64,622	67,045
Required - Chapter 356	53,876	55,716	58,334	61,119	64,133	67,049	70,025	73,128	76,487	79,987
Sufficiency / (Deficiency)	(9,980)	(10,174)	(9,943)	(10,914)	(10,816)	(11,733)	(11,312)	(12,214)	(11,865)	(12,942)
Funding Ratios										
Current Assets (MVA)	659,523	707,624	758,015	811,363	866,690	925,566	991,425	1,061,821	1,135,503	1,213,772
Actuarial Accrued Liability (AAL)	968,166	1,033,891	1,102,010	1,172,645	1,245,944	1,322,229	1,401,165	1,483,209	1,568,309	1,656,263
Unfunded AAL	308,643	326,267	343,995	361,282	379,253	396,663	409,740	421,388	432,806	442,490
Funding Ratio	68%	68%	69%	69%	70%	70%	71%	72%	72%	73%
Benefit Payments	47,804	50,928	54,788	58,779	62,711	66,919	71,309	76,070	81,358	86,982

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

In approximately the year 2035, the plan's funded ratio would be over 90% assuming a 2.0% COLA but under 90% assuming a 2.5% COLA. In approximately the year 2037, the plan's funded ratio would be over 90% assuming a 2.5% COLA. Further guidance would be needed to determine when the COLA could increase from 2.0% to 2.5%.

This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 8.0% for Five Years, 8.5% thereafter; with contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Contributions (% of Payroll)										
Statutory - Chapter 352.92	23.2%	23.2%	23.7%	23.7%	24.2%	24.2%	24.7%	24.7%	25.2%	25.2%
Required - Chapter 356	27.3%	27.6%	27.9%	28.3%	28.7%	29.1%	29.6%	30.1%	30.8%	31.7%
Sufficiency / (Deficiency)	(4.1)%	(4.4)%	(4.2)%	(4.6)%	(4.5)%	(4.9)%	(4.9)%	(5.4)%	(5.6)%	(6.5)%
Contributions										
Statutory - Chapter 352.92	71,092	73,758	78,173	81,104	85,921	89,143	94,397	97,937	103,666	107,554
Required - Chapter 356	83,781	87,772	92,116	96,691	101,722	107,084	113,053	119,518	126,903	135,185
Sufficiency / (Deficiency)	(12,689)	(14,014)	(13,943)	(15,587)	(15,801)	(17,941)	(18,656)	(21,581)	(23,237)	(27,631)
Funding Ratios										
Current Assets (MVA)	1,295,328	1,381,996	1,472,690	1,569,902	1,672,437	1,782,401	1,898,848	2,024,857	2,159,399	2,305,455
Actuarial Accrued Liability (AAL)	1,747,028	1,840,788	1,937,812	2,038,788	2,143,934	2,253,390	2,367,707	2,487,796	2,614,183	2,747,467
Unfunded AAL	451,701	458,792	465,121	468,886	471,497	470,989	468,860	462,940	454,785	442,011
Funding Ratio	74%	75%	76%	77%	78%	79%	80%	81%	83%	84%
Benefit Payments	92,744	98,583	104,109	109,827	115,843	121,776	127,315	132,905	138,519	144,193

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

In approximately the year 2035, the plan's funded ratio would be over 90% assuming a 2.0% COLA but under 90% assuming a 2.5% COLA. In approximately the year 2037, the plan's funded ratio would be over 90% assuming a 2.5% COLA. Further guidance would be needed to determine when the COLA could increase from 2.0% to 2.5%.

This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 8.0% for Five Years, 8.5% thereafter; with contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2032	2033	2034	2035	2036	2037
Contributions (% of Payroll)						
Statutory - Chapter 352.92	25.7%	25.7%	26.2%	26.2%	26.7%	26.7%
Required - Chapter 356	32.8%	34.2%	36.3%	39.7%	46.5%	66.2%
Sufficiency / (Deficiency)	(7.1)%	(8.5)%	(10.1)%	(13.5)%	(19.8)%	(39.5)%
Contributions						
Statutory - Chapter 352.92	113,801	118,068	124,879	129,562	136,986	142,123
Required - Chapter 356	145,137	157,143	173,246	196,474	238,494	352,350
Sufficiency / (Deficiency)	(31,336)	(39,075)	(48,367)	(66,912)	(101,508)	(210,227)
Funding Ratios						
Current Assets (MVA)	2,462,021	2,632,554	2,816,333	3,016,945	3,233,307	3,469,374
Actuarial Accrued Liability (AAL)	2,888,264	3,037,415	3,195,880	3,364,363	3,543,529	3,734,147
Unfunded AAL	426,243	404,861	379,547	347,418	310,222	264,773
Funding Ratio	85%	87%	88%	90%	91%	93%
Benefit Payments						
	149,765	155,186	160,788	166,671	172,785	178,832

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

In approximately the year 2035, the plan's funded ratio would be over 90% assuming a 2.0% COLA but under 90% assuming a 2.5% COLA. In approximately the year 2037, the plan's funded ratio would be over 90% assuming a 2.5% COLA. Further guidance would be needed to determine when the COLA could increase from 2.0% to 2.5%.

This exhibit should only be viewed
in conjunction with GRS' January 31,
2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 9.5% for Five Years, 10.0% thereafter; without contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%	20.7%
Required - Chapter 356	25.4%	25.0%	24.9%	24.8%	24.7%	24.5%	24.1%	23.8%	23.4%	22.9%
Sufficiency / (Deficiency)	(4.7)%	(4.3)%	(4.2)%	(4.1)%	(4.0)%	(3.8)%	(3.4)%	(3.1)%	(2.7)%	(2.2)%
Contributions										
Statutory - Chapter 352.92	43,896	45,542	47,249	49,021	50,860	52,767	54,746	56,799	58,929	61,138
Required - Chapter 356	53,876	55,058	56,871	58,759	60,682	62,362	63,854	65,272	66,590	67,744
Sufficiency / (Deficiency)	(9,980)	(9,516)	(9,622)	(9,738)	(9,822)	(9,595)	(9,108)	(8,473)	(7,661)	(6,606)
Funding Ratios										
Current Assets (MVA)	659,523	717,483	779,380	844,880	914,252	987,998	1,071,215	1,160,196	1,255,202	1,356,364
Actuarial Accrued Liability (AAL)	968,166	1,033,891	1,102,010	1,172,645	1,245,944	1,322,229	1,401,165	1,483,209	1,568,309	1,656,263
Unfunded AAL	308,643	316,407	322,630	327,765	331,691	334,231	329,950	323,013	313,107	299,898
Funding Ratio	68%	69%	71%	72%	73%	75%	76%	78%	80%	82%
Benefit Payments	47,804	50,928	54,788	58,779	62,711	66,919	71,309	76,070	81,358	86,982

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

In approximately the year 2025, the plan's funded ratio would be over 90% assuming a 2.0% COLA but under 90% assuming a 2.5% COLA. In approximately the year 2026, the plan's funded ratio would be over 90% assuming a 2.5% COLA. Further guidance would be needed to determine when the COLA could increase from 2.0% to 2.5%.

This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 9.5% for Five Years, 10.0% thereafter; without contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2022	2023	2024	2025	2026
Contributions (% of Payroll)					
Statutory - Chapter 352.92	20.7%	20.7%	20.7%	20.7%	20.7%
Required - Chapter 356	22.4%	21.8%	21.1%	20.3%	19.3%
Sufficiency / (Deficiency)	(1.7)%	(1.1)%	(0.4)%	0.4%	1.4%
Contributions					
Statutory - Chapter 352.92	63,431	65,810	68,278	70,838	73,494
Required - Chapter 356	68,691	69,365	69,653	69,420	68,496
Sufficiency / (Deficiency)	(5,260)	(3,555)	(1,375)	1,418	4,998
Funding Ratios					
Current Assets (MVA)	1,464,027	1,578,783	1,701,348	1,832,925	1,974,309
Actuarial Accrued Liability (AAL)	1,747,028	1,840,788	1,937,812	2,038,788	2,143,934
Unfunded AAL	283,001	262,005	236,464	205,863	169,625
Funding Ratio	84%	86%	88%	90%	92%
Benefit Payments	92,744	98,583	104,109	109,827	115,843

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

In approximately the year 2025, the plan's funded ratio would be over 90% assuming a 2.0% COLA but under 90% assuming a 2.5% COLA. In approximately the year 2026, the plan's funded ratio would be over 90% assuming a 2.5% COLA. Further guidance would be needed to determine when the COLA could increase from 2.0% to 2.5%.

This exhibit should only be viewed
in conjunction with GRS' January 31,
2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 9.5% for Five Years, 10.0% thereafter; with contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Contributions (% of Payroll)										
Statutory - Chapter 352.92	20.7%	20.7%	21.2%	21.2%	21.7%	21.7%	22.2%	22.2%	22.7%	22.7%
Required - Chapter 356	25.4%	25.0%	24.9%	24.8%	24.6%	24.3%	23.9%	23.4%	22.8%	22.1%
Sufficiency / (Deficiency)	(4.7)%	(4.3)%	(3.7)%	(3.6)%	(2.9)%	(2.6)%	(1.7)%	(1.2)%	(0.1)%	0.6%
Contributions										
Statutory - Chapter 352.92	43,896	45,542	48,391	50,205	53,317	55,316	58,713	60,914	64,622	67,045
Required - Chapter 356	53,876	55,058	56,871	58,675	60,497	61,959	63,191	64,186	64,995	65,410
Sufficiency / (Deficiency)	(9,980)	(9,516)	(8,480)	(8,470)	(7,180)	(6,643)	(4,478)	(3,272)	(373)	1,635
Funding Ratios										
Current Assets (MVA)	659,523	717,483	779,380	846,075	916,802	993,363	1,079,793	1,173,797	1,274,485	1,383,554
Actuarial Accrued Liability (AAL)	968,166	1,033,891	1,102,010	1,172,645	1,245,944	1,322,229	1,401,165	1,483,209	1,568,309	1,656,263
Unfunded AAL	308,643	316,407	322,630	326,570	329,142	328,866	321,371	309,412	293,824	272,708
Funding Ratio	68%	69%	71%	72%	74%	75%	77%	79%	81%	84%
Benefit Payments	47,804	50,928	54,788	58,779	62,711	66,919	71,309	76,070	81,358	86,982

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

In approximately the year 2024, the plan's funded ratio would be over 90% assuming a 2.0% COLA but under 90% assuming a 2.5% COLA. In approximately the year 2025, the plan's funded ratio would be over 90% assuming a 2.5% COLA. Further guidance would be needed to determine when the COLA could increase from 2.0% to 2.5%.

This exhibit should only be viewed in conjunction with GRS' January 31, 2013 letter to MSRS

Correctional Employees Retirement Fund
Scenario: 9.5% for Five Years, 10.0% thereafter; with contribution stabilizer
Fiscal year beginning July 1

\$ in Thousands	2022	2023	2024	2025
Contributions (% of Payroll)				
Statutory - Chapter 352.92	22.7%	22.2%	22.2%	21.7%
Required - Chapter 356	21.4%	20.5%	19.5%	18.3%
Sufficiency / (Deficiency)	1.3%	1.7%	2.7%	3.4%
Contributions				
Statutory - Chapter 352.92	69,560	70,579	73,225	74,260
Required - Chapter 356	65,461	65,047	64,173	62,519
Sufficiency / (Deficiency)	4,099	5,532	9,052	11,741
Funding Ratios				
Current Assets (MVA)	1,500,139	1,624,940	1,757,129	1,899,479
Actuarial Accrued Liability (AAL)	1,747,028	1,840,788	1,937,812	2,038,788
Unfunded AAL	246,889	215,847	180,683	139,309
Funding Ratio	86%	88%	91%	93%
Benefit Payments	92,744	98,583	104,109	109,827

Assumes annual postretirement increases of 2.0% for all years

Numbers may not add due to rounding

In approximately the year 2024, the plan's funded ratio would be over 90% assuming a 2.0% COLA but under 90% assuming a 2.5% COLA. In approximately the year 2025, the plan's funded ratio would be over 90% assuming a 2.5% COLA. Further guidance would be needed to determine when the COLA could increase from 2.0% to 2.5%.