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January 27, 2016

Ms. Laurie Hacking
Executive Director
Teacher Retirement Association of Minnesota
60 Empire Drive, Suite 400
St. Paul, MN   55103

Re: Projection of Future Actuarial Results

Dear Laurie:

Attached to this letter are both graphs and tables that show the estimated funded status, required and statutory contribution rates, contributions and benefit payments, and the unfunded actuarial accrued liability (UAAL) under three investment return scenarios for the Teachers Retirement Association of Minnesota (TRA). These projections are for a thirty year period beginning with the July 1, 2015 actuarial valuation. Based on your discussion with the Legislative Commission on Pensions and Retirement (LCPR) staff, these projections were developed with the assumptions proposed in our experience study, as adopted by the Board (reflecting the MP-2015 projection scale). The current benefit provisions as provided in statute are also reflected. As required by the LCPR Standards for Actuarial Work, projections of key valuation results are shown assuming future investment returns equal to the actuarial assumed rate of return and a return 1.5% higher and lower than the assumed rate of return. The resulting investment return scenarios for these projections are:

   (1) 6.5% for all years,
   (2) 8.0% for all years, and
   (3) 9.5% for all years.

While the actual investment returns earned in future years changed under the different scenarios, the investment return assumption of 8.0% proposed in the experience study was not changed, as specified by the LCPR standards. As a result, the actuarial accrued liability is the same under all three scenarios. It should be noted that these projections are strictly for the purpose of sensitivity analysis, as required by the LCPR. The scenarios that reflect a rate of return of 6.5% or 9.5% do not represent likely outcomes because neither changes to the contribution rates nor changes to the benefit structure are assumed to be implemented despite the valuation results. In reality, if the funding results in either of those scenarios were to actually occur, contributions and/or benefit provisions would most likely be adjusted.

The projections are developed by first creating a demographic profile of recent new entrants. Next, the membership population from the July 1, 2015 valuation is projected forward one year assuming all demographic assumptions are met. Members who are assumed to leave active employment are replaced with an equal number of new members from the new entrant demographic profile mentioned earlier. Then, a valuation is performed as of July 1, 2016 to determine the various actuarial liabilities and cost measurements. The last two steps are repeated in each future year until projections have been performed through the July 1, 2045 valuation. Current law provides for a stabilizer mechanism, as described in Minnesota Statutes Chapter 354.42, to adjust future contribution rates. Our understanding is that the contribution stabilizer may be used at the Board's discretion, but we have no basis for determining how, or if, it may be used in the future. Based on discussions with TRA staff regarding the expected utilization of the stabilizer procedure, we have assumed for purposes of these projections that it will not be used.

Postretirement Benefit Increases

One of the key assumptions that affects the projected valuation results is the expectation of annual increases in the benefit amounts paid to retirees and beneficiaries. Under current law, if the plan reaches a funded ratio of 90% (using the market value of assets) in the future for two consecutive years, postretirement adjustment increases will revert to the 2.5% level (currently 2.0%). Our projections estimate the time until the COLA increase is anticipated based on the dynamic modeling of the market value of assets. This avoids any dramatic dips in the funded ratio once the requirement for the increase in the COLA to 2.5% is met. The valuation results in the projections use an actuarial accrued liability measure based on the dynamically determined number of years until the COLA is assumed to increase to 2.5%. The following table summarizes the modeled results for when the COLA is projected to increase.

Assumed Investment Return	Estimated Date of COLA Increase
6.5%	*
8.0%	*
9.5%	2031

*Not projected to reach 90% funding ratio within the 30 year projection period.

The calculation of the required contribution rate for TRA uses a closed amortization period of 22 years for the July 1, 2015 valuation. Because the amortization period is closed, it eventually reaches one year in the July 1, 2036 valuation and remains at one year for all subsequent years if the actuarial accrued liability is greater than the actuarial value of assets. If the actuarial value of assets is greater than the actuarial accrued liability, the amortization period is reset to an open thirty (30) year period. Under several of the scenarios, the short amortization period leads to required contribution rates that are very large and/or volatile in the last few years of the projection period. If those scenarios occur, there would likely be changes made to prevent such a contribution pattern before the amortization period reached one year, but the requirements of the LCPR Standards for Actuarial Work preclude us from reflecting any change in the amortization period in our projections. This fact should be considered when viewing the results in the later years of the projection study.

In preparing these exhibits, we have followed the LCPR Standards for Actuarial Work, with the following exceptions which are permitted. Because of the expected changes in the active membership demographics over time as members of the pre-July 1, 1989 tier leave covered employment and are replaced by new employees with different retirement eligibility provisions as well as different demographic patterns, we have modeled future populations and valued them directly. We believe that this approach provides a better

reflection of future valuation results than would be produced by using simplified assumptions of a constant normal cost rate and fixed growth in covered payroll.

Disclaimers, Caveats, and Limitations

The projection results are based upon the July 1, 2015 actuarial valuation results, the actuarial assumptions proposed in the 2015 Experience Study and adopted by the Board of Trustees, and the projection model prepared by the Fund's actuary, Cavanaugh Macdonald Consulting. Significant items are noted below:

- The investment returns in all future years, as described earlier in this letter, are assumed to apply to the market value of assets.

- All demographic assumptions regarding mortality, disability, retirement, salary increases, and termination of employment are assumed to be met exactly in each year in the future. Please note that the actuarial assumption assumes that mortality will improve in the future (i.e. people will live longer).

- Changes in other programs may have an effect on future retirement patterns. For example, if changes in Social Security and/or Medicare are implemented to reduce benefits or delay eligibility for those programs, retirements from TRA are likely to also be delayed, thereby lowering the cost of the plan. However, because such changes cannot be reasonably anticipated, they are not reflected in this analysis.

- The number of active members covered by TRA in the future is assumed to remain level (neither growth nor decline in the active membership count). As active members leave employment, they are assumed to be replaced by new employees who have a similar demographic profile as recent new hires. With the departure of current active members who were hired before July 1, 1989, whose benefit structure has different retirement eligibility provisions from those of members hired since then, the demographic composition of the membership may gradually change over time.

- Plan provisions and scheduled contribution rate increases are assumed to remain unchanged from current law. As noted earlier, the contribution stabilizer could be used to adjust the contribution rate, but because it is discretionary, we have not reflected its usage.

- The funding methods, including the entry age normal cost method, the asset smoothing method, and the amortization method and period, are as set out in statute. When the amortization period reaches a duration of one year with the July 1, 2036 valuation, it is assumed to remain at one year for all future valuations.

- The current supplementary contributions made by the state are assumed to continue to be paid at approximately the same dollar amount as currently paid.

- The actuaries relied upon the membership data provided by TRA for the actuarial valuation. The numerical results depend on the integrity of this information. If there are material inaccuracies in this data, the results presented herein may be different and the projections may need to be revised.

Models are designed to identify anticipated trends and to compare various scenarios rather than predicting some future state of events. These projections are based on TRA's estimated financial status on July 1, 2015, and project future events using one set of assumptions out of a range of many possibilities. The projections do not predict the Fund's financial condition or its ability to pay benefits in the future and do not provide any guarantee of future financial soundness of the Fund. Over time, a defined benefit plan's total cost will depend on a number of factors, including the amount of benefits paid, the number of people paid benefits, the duration of the benefit payments, plan expenses, and the amount of earnings on assets invested to pay benefits. These amounts and other variables are uncertain and unknowable at the time the projections were made. Because not all of the assumptions will unfold exactly as expected, actual results

will differ from the projections. To the extent that actual experience deviates significantly from the assumptions, results could be significantly better or significantly worse than indicated in this letter. Decisions about making change to the benefit structure, funding the plan, or investment policy should not be made on the basis of these projections, but only after comprehensive analysis of alternative sets of assumptions.

We, Patrice A. Beckham and Brent A. Banister, are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. We are available to answer any questions on the material in this letter or to provide explanations or further details as appropriate. We also meet the requirements of "approved actuary" under Minnesota Statutes, Section 356.215, Subdivision1, Paragraph (c).

Sincerely,

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

Brent A. Banister, PhD, FSA, EA, FCA, MAAA
Chief Pension Actuary

Teachers Retirement Association of Minnesota

Exhibit A
All Investment Return Scenarios
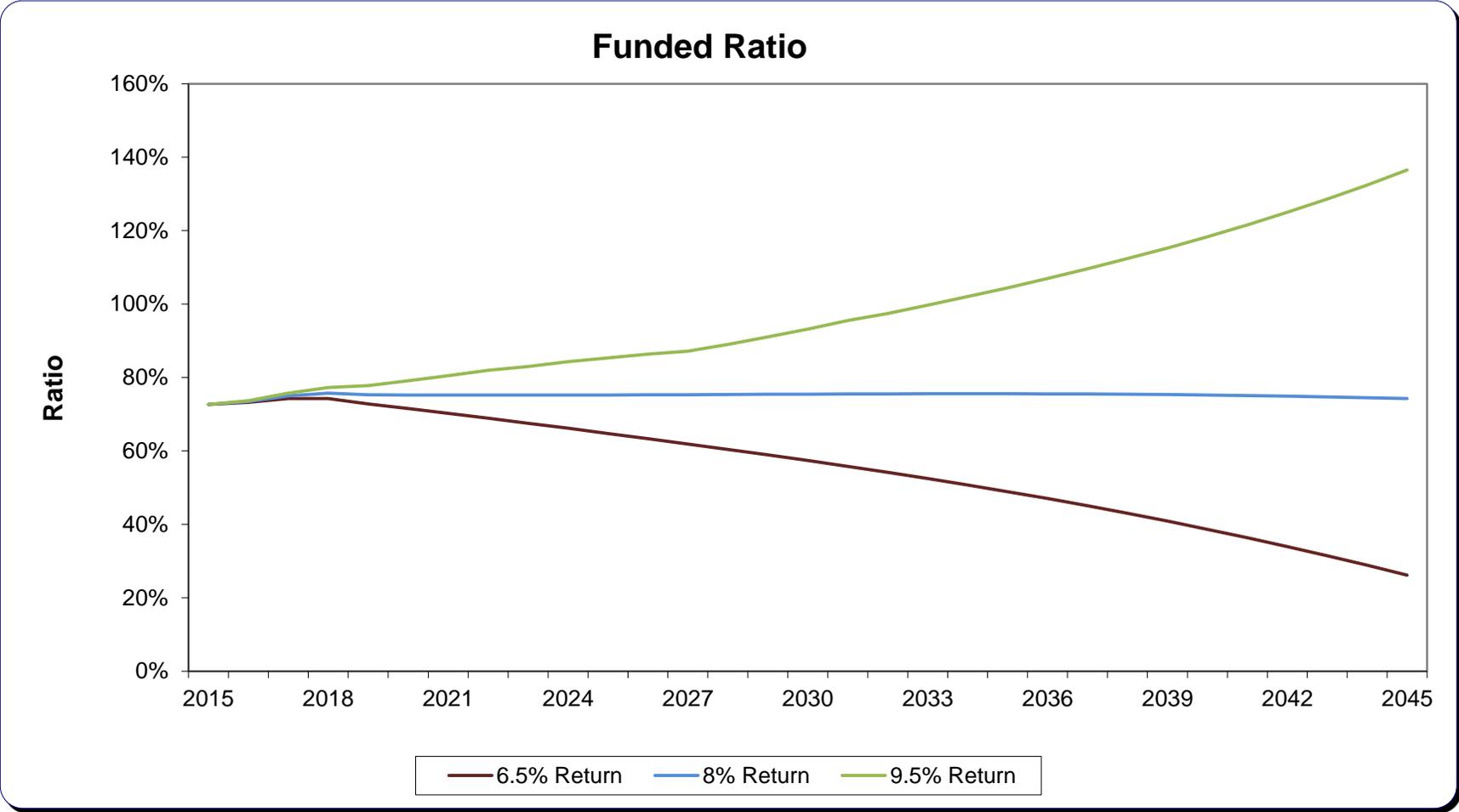
Funded Ratio

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.

Exhibit B-1
8.0% Actual Investment Return in Future Years
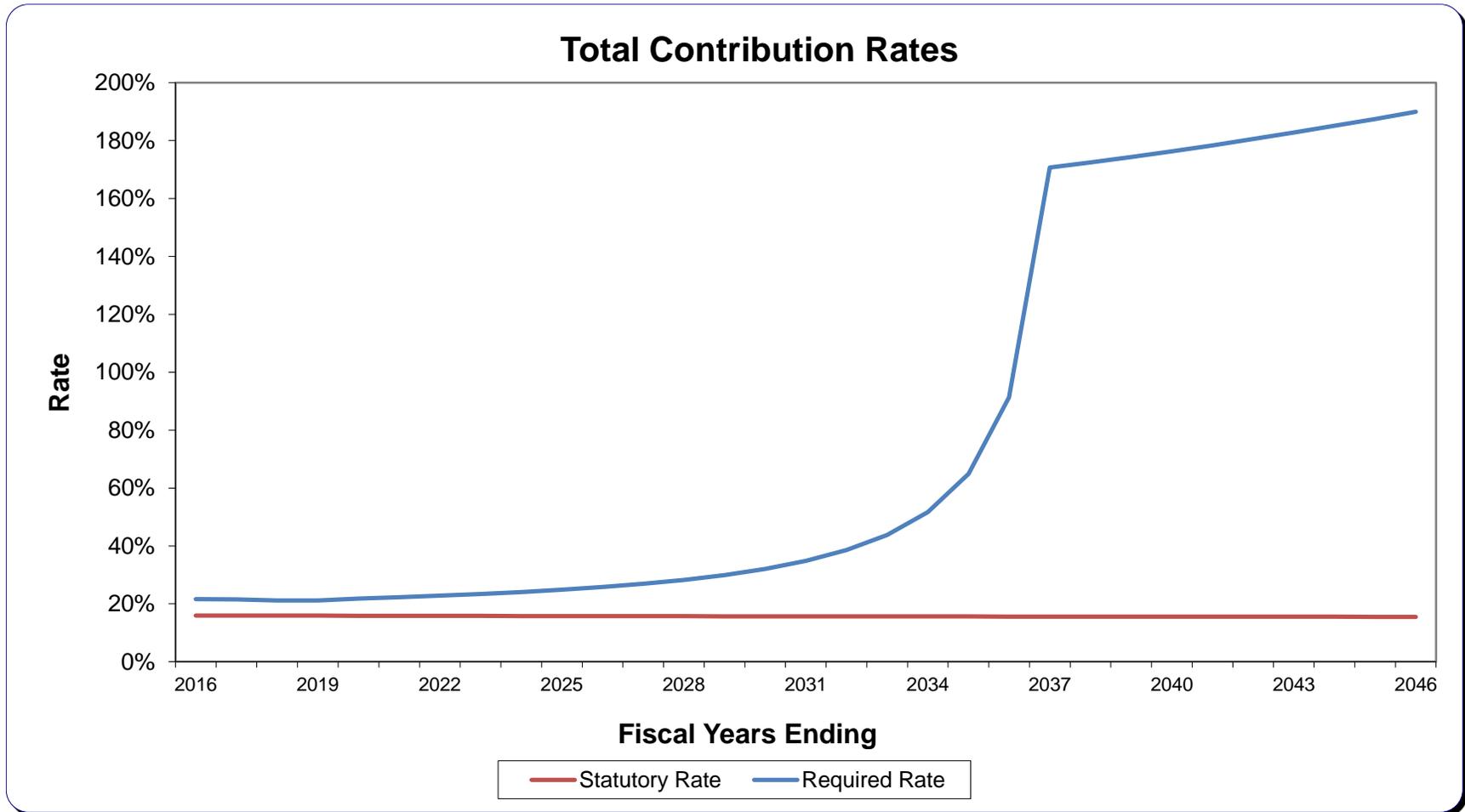
Total Contribution Rates

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.

Exhibit B-2

8.0% Actual Investment Return in Future Years

Unfunded Actuarial Accrued Liability (UAAL)

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.

Exhibit B-3
8.0% Actual Investment Return in Future Years

Contributions and Benefit Payments

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology
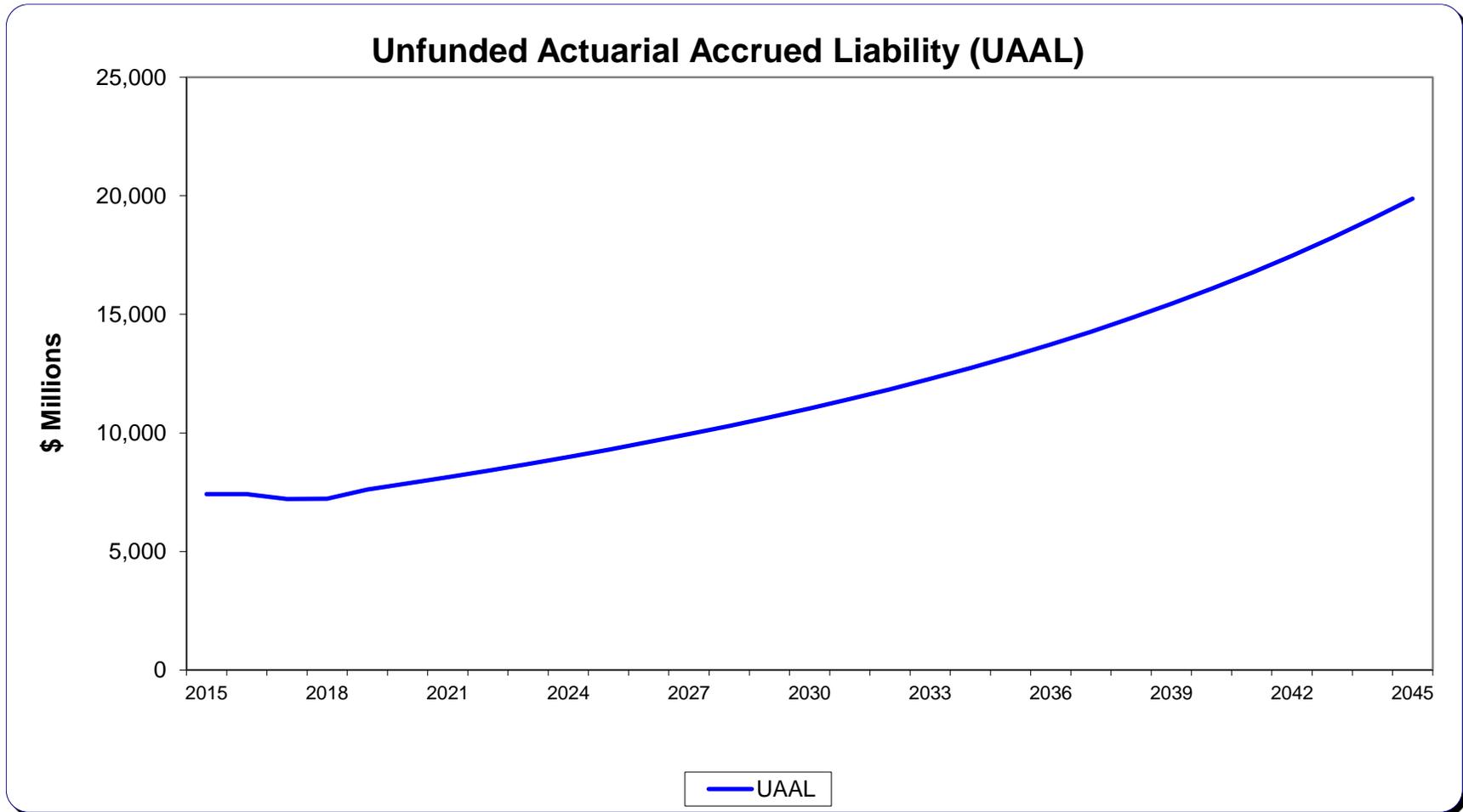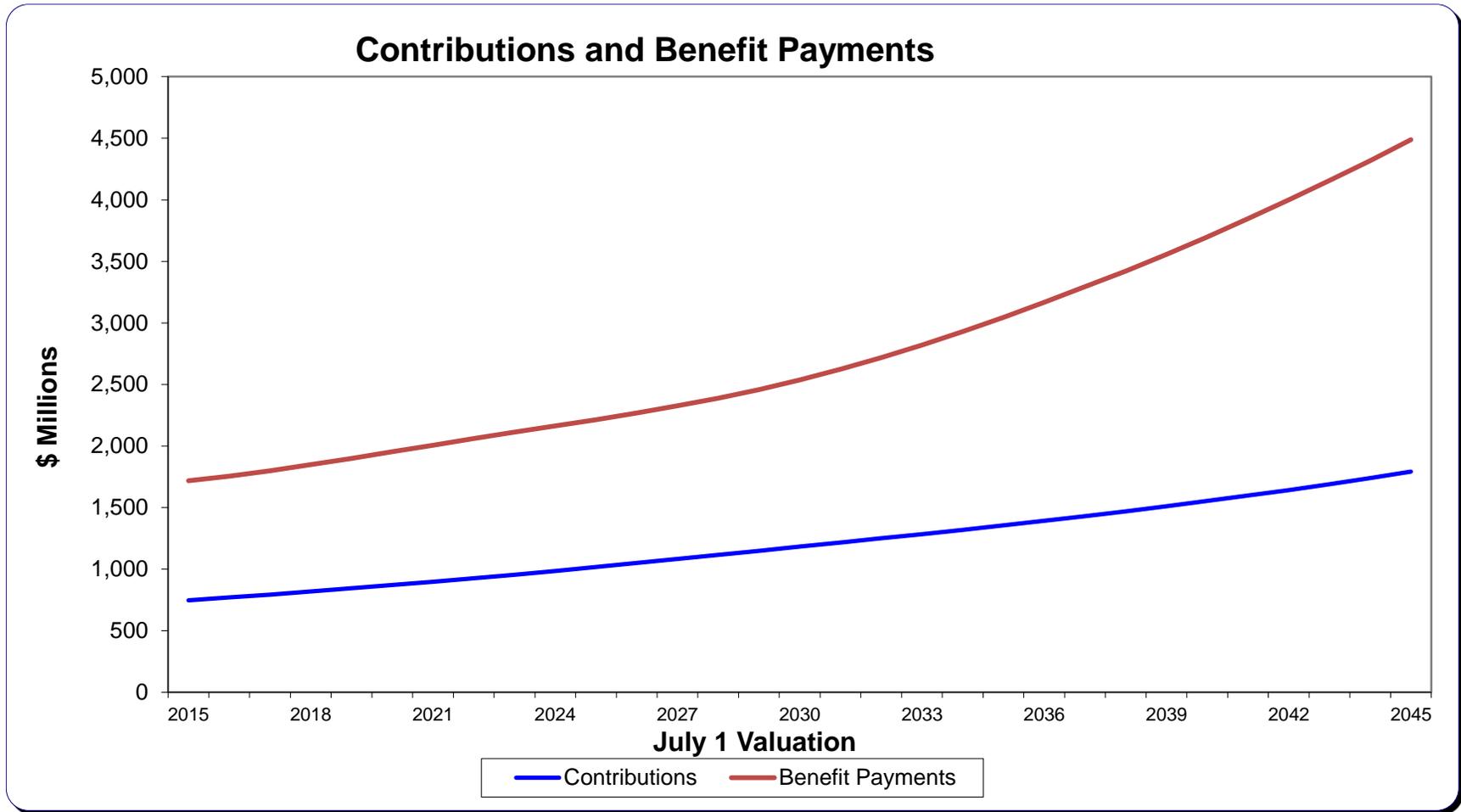
Teachers Retirement Association of Minnesota
## Exhibit C
8.0% Actual Investment Return in Future Years

July 1	Asset Values Actuarial	Asset Values Market	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Funded Ratio	Contribution Rates Statutory	Contribution Rates Required	Contribution Rates Sufficiency/ (Deficiency)	Total Contributions	Benefit Payments
2015	$19,696.89	$20,441.99	$27,117.55	$7,420.65	73%	15.97%	21.65%	-5.68%	$745.26	$1,718.32
2016	20,544.72	21,066.12	27,964.32	7,419.61	73%	15.94%	21.51%	-5.57%	769.53	1,754.38
2017	21,639.27	21,727.93	28,854.81	7,215.54	75%	15.92%	21.20%	-5.28%	792.85	1,797.59
2018	22,563.22	22,422.01	29,786.89	7,223.67	76%	15.90%	21.19%	-5.29%	817.81	1,847.56
2019	23,145.63	23,145.63	30,757.11	7,611.48	75%	15.88%	21.81%	-5.93%	843.56	1,898.96
2020	23,900.47	23,900.47	31,767.76	7,867.29	75%	15.85%	22.27%	-6.42%	869.90	1,952.34
2021	24,687.60	24,687.60	32,820.22	8,132.62	75%	15.83%	22.79%	-6.96%	897.08	2,006.55
2022	25,509.62	25,509.62	33,917.45	8,407.82	75%	15.81%	23.38%	-7.57%	925.16	2,060.38
2023	26,370.64	26,370.64	35,063.92	8,693.28	75%	15.79%	24.06%	-8.27%	954.50	2,112.43
2024	27,276.93	27,276.93	36,266.19	8,989.26	75%	15.78%	24.85%	-9.07%	985.16	2,163.29
2025	28,234.74	28,234.74	37,531.13	9,296.39	75%	15.76%	25.77%	-10.01%	1,016.84	2,214.14
2026	29,249.25	29,249.25	38,864.61	9,615.37	75%	15.74%	26.88%	-11.14%	1,049.16	2,267.97
2027	30,322.57	30,322.57	40,269.68	9,947.11	75%	15.72%	28.24%	-12.52%	1,081.93	2,325.76
2028	31,455.75	31,455.75	41,748.52	10,292.78	75%	15.71%	29.91%	-14.20%	1,115.11	2,388.93
2029	32,648.41	32,648.41	43,302.02	10,653.60	75%	15.69%	32.04%	-16.35%	1,148.59	2,458.04
2030	33,899.47	33,899.47	44,930.47	11,031.00	75%	15.68%	34.80%	-19.12%	1,182.21	2,535.92
2031	35,204.61	35,204.61	46,630.93	11,426.32	75%	15.66%	38.53%	-22.87%	1,215.86	2,622.68
2032	36,558.97	36,558.97	48,400.36	11,841.39	76%	15.65%	43.77%	-28.12%	1,249.74	2,717.59
2033	37,958.26	37,958.26	50,236.11	12,277.86	76%	15.64%	51.68%	-36.04%	1,284.03	2,819.45
2034	39,399.27	39,399.27	52,136.73	12,737.46	76%	15.63%	64.89%	-49.26%	1,319.18	2,928.63
2035	40,878.62	40,878.62	54,100.48	13,221.86	76%	15.61%	91.33%	-75.72%	1,355.25	3,044.56
2036	42,393.32	42,393.32	56,126.14	13,732.81	76%	15.60%	170.74%	-155.14%	1,392.14	3,166.94
2037	43,940.36	43,940.36	58,212.55	14,272.19	75%	15.59%	172.52%	-156.93%	1,430.15	3,293.06
2038	45,519.59	45,519.59	60,361.68	14,842.09	75%	15.58%	174.38%	-158.80%	1,469.66	3,421.38
2039	47,132.87	47,132.87	62,577.59	15,444.73	75%	15.57%	176.32%	-160.75%	1,510.63	3,556.07
2040	48,777.81	48,777.81	64,860.18	16,082.37	75%	15.56%	178.39%	-162.83%	1,552.89	3,698.60
2041	50,450.15	50,450.15	67,207.47	16,757.31	75%	15.55%	180.56%	-165.01%	1,596.62	3,846.62
2042	52,147.90	52,147.90	69,620.10	17,472.20	75%	15.54%	182.82%	-167.28%	1,642.16	3,999.22
2043	53,870.20	53,870.20	72,100.05	18,229.86	75%	15.53%	185.14%	-169.61%	1,689.73	4,156.54
2044	55,616.23	55,616.23	74,649.39	19,033.16	75%	15.52%	187.52%	-172.00%	1,739.73	4,318.37
2045	57,385.72	57,385.72	77,270.44	19,884.72	74%	15.51%	189.96%	-174.45%	1,791.94	4,487.84

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.

Teachers Retirement Association of Minnesota

Exhibit D-1
6.5% Actual Investment Return in Future Years
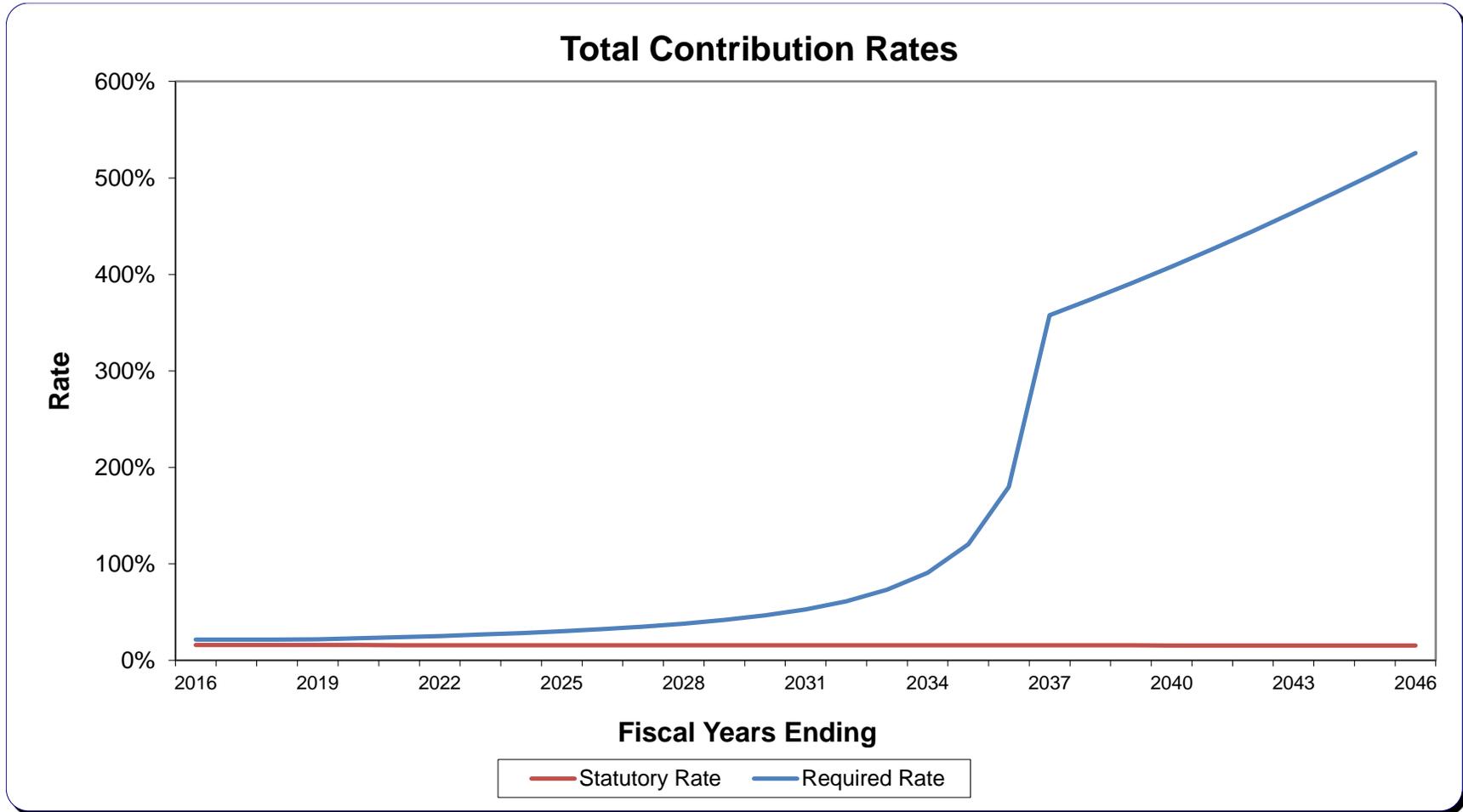
Total Contribution Rates

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.

Teachers Retirement Association of Minnesota

Exhibit D-2
6.5% Actual Investment Return in Future Years

Unfunded Actuarial Accrued Liability (UAAL)

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.

Exhibit D-3
6.5% Actual Investment Return in Future Years

Contributions and Benefit Payments

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.
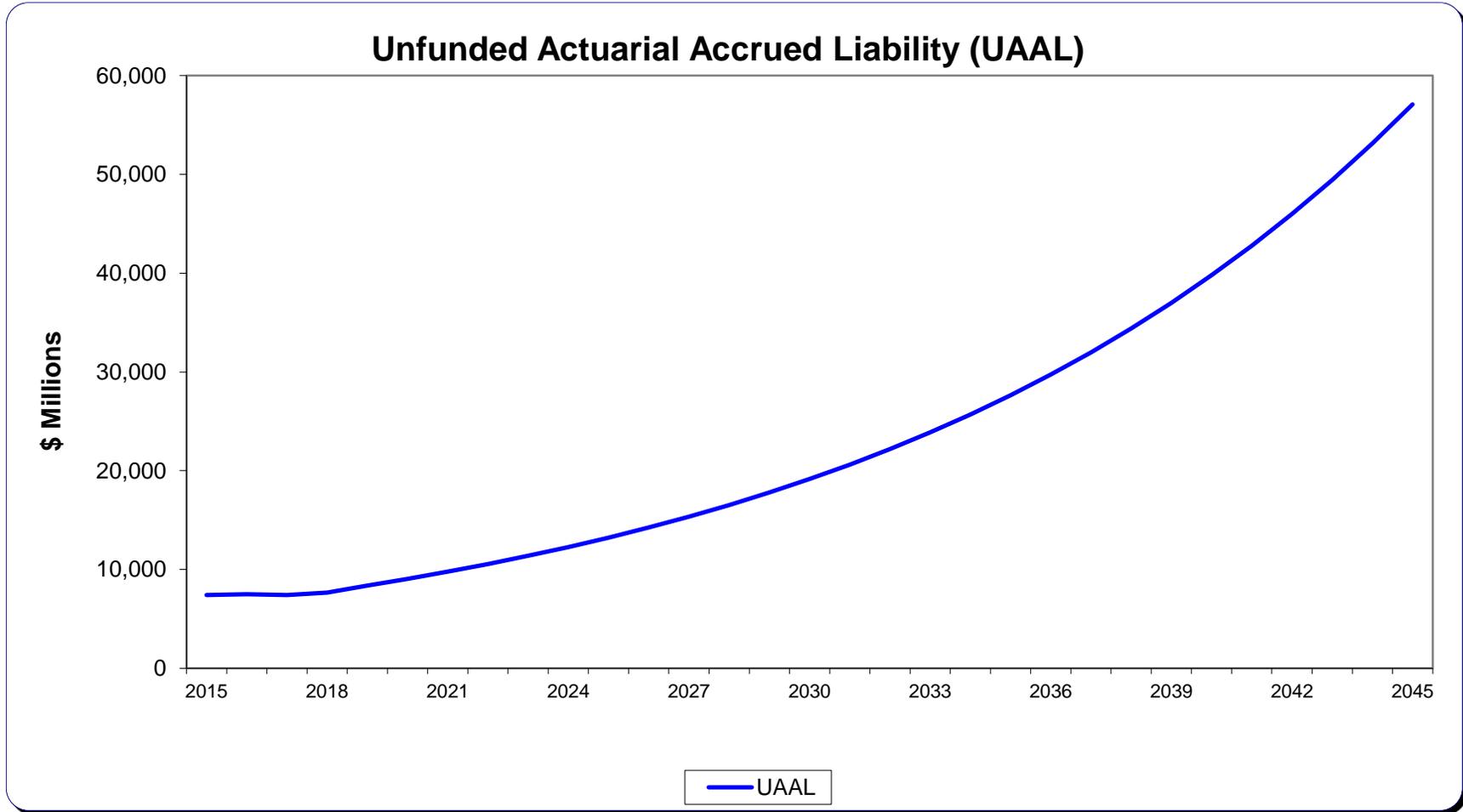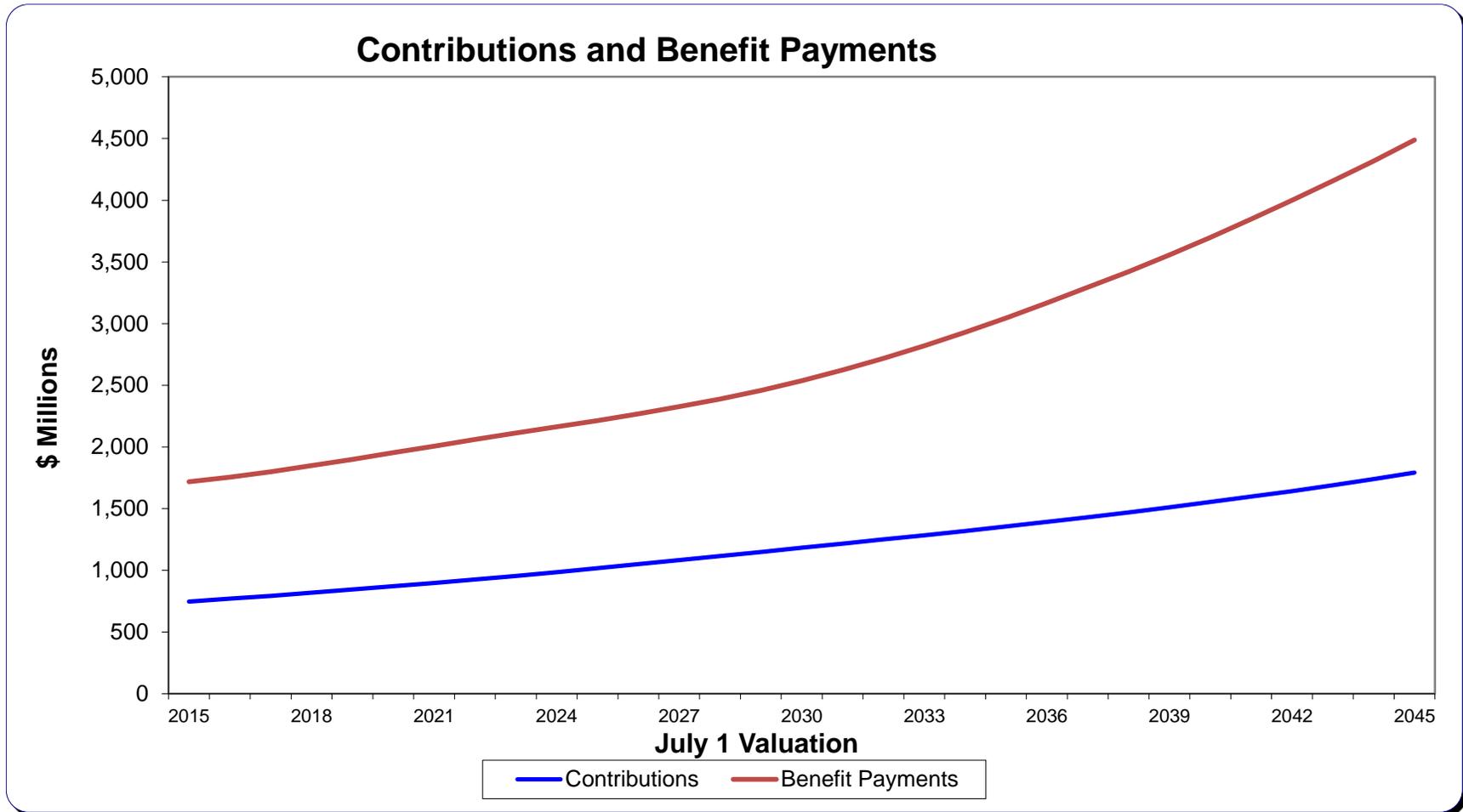
Teachers Retirement Association of Minnesota
## Exhibit E
6.5% Actual Investment Return in Future Years

July 1	Asset Values Actuarial	Asset Values Market	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Funded Ratio	Contribution Rates Statutory	Contribution Rates Required	Contribution Rates Sufficiency/ (Deficiency)	Total Contributions	Benefit Payments
2015	$19,696.89	$20,441.99	$27,117.55	$7,420.65	73%	15.97%	21.65%	-5.68%	$745.26	$1,718.32
2016	20,484.80	20,766.54	27,964.32	7,479.52	73%	15.94%	21.61%	-5.67%	769.53	1,754.38
2017	21,434.60	21,100.01	28,854.81	7,420.22	74%	15.92%	21.51%	-5.59%	792.85	1,797.59
2018	22,125.68	21,434.63	29,786.89	7,661.21	74%	15.90%	21.86%	-5.96%	817.81	1,847.56
2019	22,383.65	21,765.20	30,757.11	8,373.46	73%	15.88%	22.97%	-7.09%	843.56	1,898.96
2020	22,718.85	22,090.78	31,767.76	9,048.91	72%	15.85%	24.09%	-8.24%	869.90	1,952.34
2021	23,047.20	22,409.61	32,820.22	9,773.02	70%	15.83%	25.34%	-9.51%	897.08	2,006.55
2022	23,368.23	22,721.28	33,917.45	10,549.22	69%	15.81%	26.75%	-10.94%	925.16	2,060.38
2023	23,682.76	23,026.64	35,063.92	11,381.17	68%	15.79%	28.37%	-12.58%	954.50	2,112.43
2024	23,993.51	23,328.39	36,266.19	12,272.68	66%	15.78%	30.22%	-14.44%	985.16	2,163.29
2025	24,302.91	23,628.93	37,531.13	13,228.22	65%	15.76%	32.39%	-16.63%	1,016.84	2,214.14
2026	24,611.98	23,929.20	38,864.61	14,252.64	63%	15.74%	34.97%	-19.23%	1,049.16	2,267.97
2027	24,918.32	24,226.81	40,269.68	15,351.36	62%	15.72%	38.08%	-22.36%	1,081.93	2,325.76
2028	25,218.10	24,517.93	41,748.52	16,530.42	60%	15.71%	41.91%	-26.20%	1,115.11	2,388.93
2029	25,505.70	24,797.03	43,302.02	17,796.32	59%	15.69%	46.73%	-31.04%	1,148.59	2,458.04
2030	25,774.39	25,057.51	44,930.47	19,156.08	57%	15.68%	52.97%	-37.29%	1,182.21	2,535.92
2031	26,013.86	25,289.23	46,630.93	20,617.07	56%	15.66%	61.35%	-45.69%	1,215.86	2,622.68
2032	26,212.86	25,481.21	48,400.36	22,187.50	54%	15.65%	73.14%	-57.49%	1,249.74	2,717.59
2033	26,360.37	25,622.69	50,236.11	23,875.75	52%	15.64%	90.89%	-75.25%	1,284.03	2,819.45
2034	26,446.03	25,703.63	52,136.73	25,690.69	51%	15.63%	120.50%	-104.87%	1,319.18	2,928.63
2035	26,458.95	25,713.43	54,100.48	27,641.53	49%	15.61%	179.79%	-164.18%	1,355.25	3,044.56
2036	26,388.17	25,641.46	56,126.14	29,737.96	47%	15.60%	357.79%	-342.19%	1,392.14	3,166.94
2037	26,222.28	25,476.58	58,212.55	31,990.27	45%	15.59%	373.95%	-358.36%	1,430.15	3,293.06
2038	25,952.20	25,210.05	60,361.68	34,409.49	43%	15.58%	390.70%	-375.12%	1,469.66	3,421.38
2039	25,570.35	24,834.54	62,577.59	37,007.24	41%	15.57%	408.07%	-392.50%	1,510.63	3,556.07
2040	25,064.31	24,337.92	64,860.18	39,795.88	39%	15.56%	426.16%	-410.60%	1,552.89	3,698.60
2041	24,419.12	23,705.53	67,207.47	42,788.35	36%	15.55%	444.92%	-429.37%	1,596.62	3,846.62
2042	23,621.46	22,924.43	69,620.10	45,998.64	34%	15.54%	464.31%	-448.77%	1,642.16	3,999.22
2043	22,658.41	21,982.05	72,100.05	49,441.64	31%	15.53%	484.27%	-468.74%	1,689.73	4,156.54
2044	21,516.36	20,865.16	74,649.39	53,133.04	29%	15.52%	504.74%	-489.22%	1,739.73	4,318.37
2045	20,181.41	19,560.27	77,270.44	57,089.04	26%	15.51%	525.77%	-510.26%	1,791.94	4,487.84

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.

Exhibit F-1
9.5% Actual Investment Return in Future Years
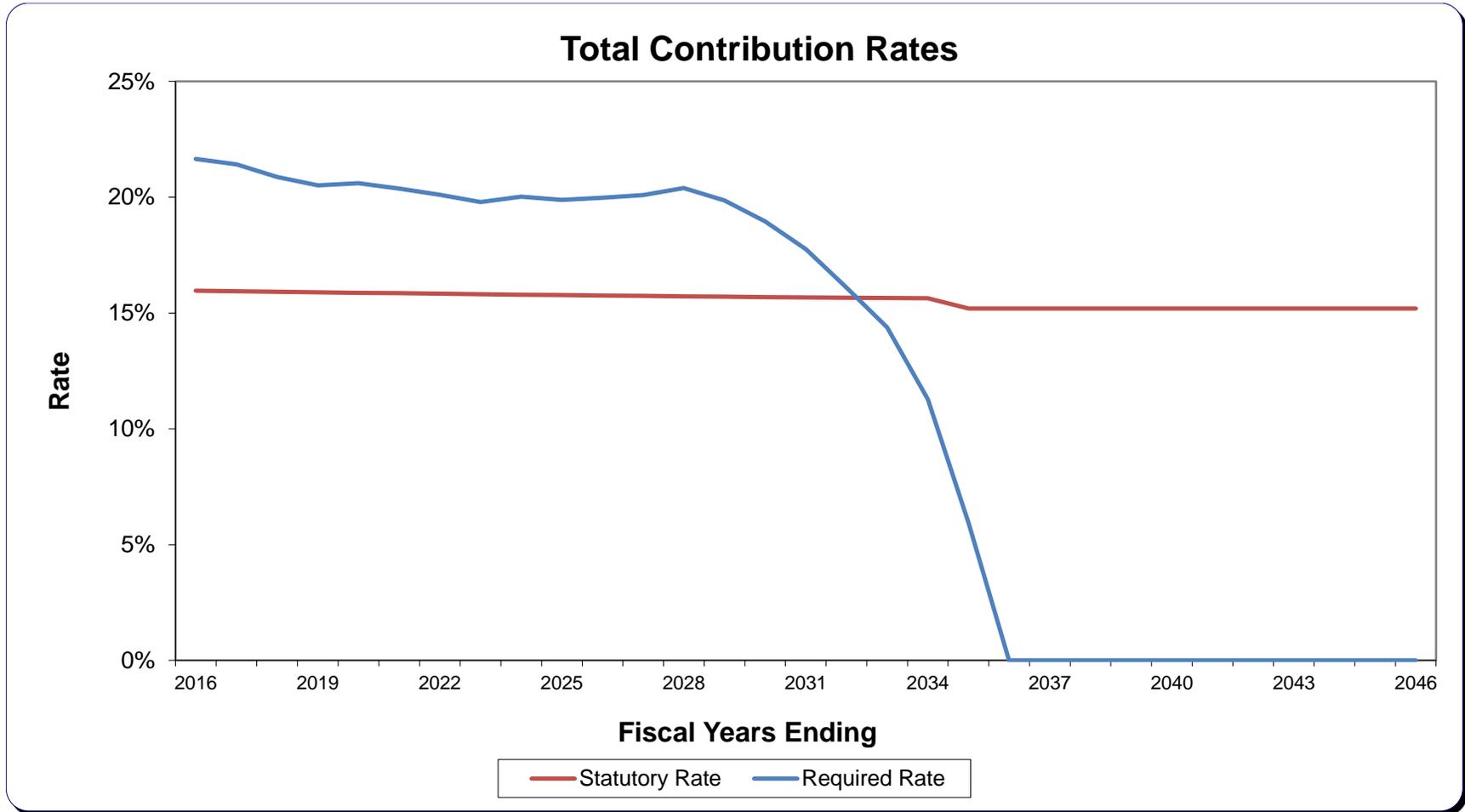
Total Contribution Rates

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.

Teachers Retirement Association of Minnesota

Exhibit F-2
9.5% Actual Investment Return in Future Years

Unfunded Actuarial Accrued Liability (UAAL)

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.
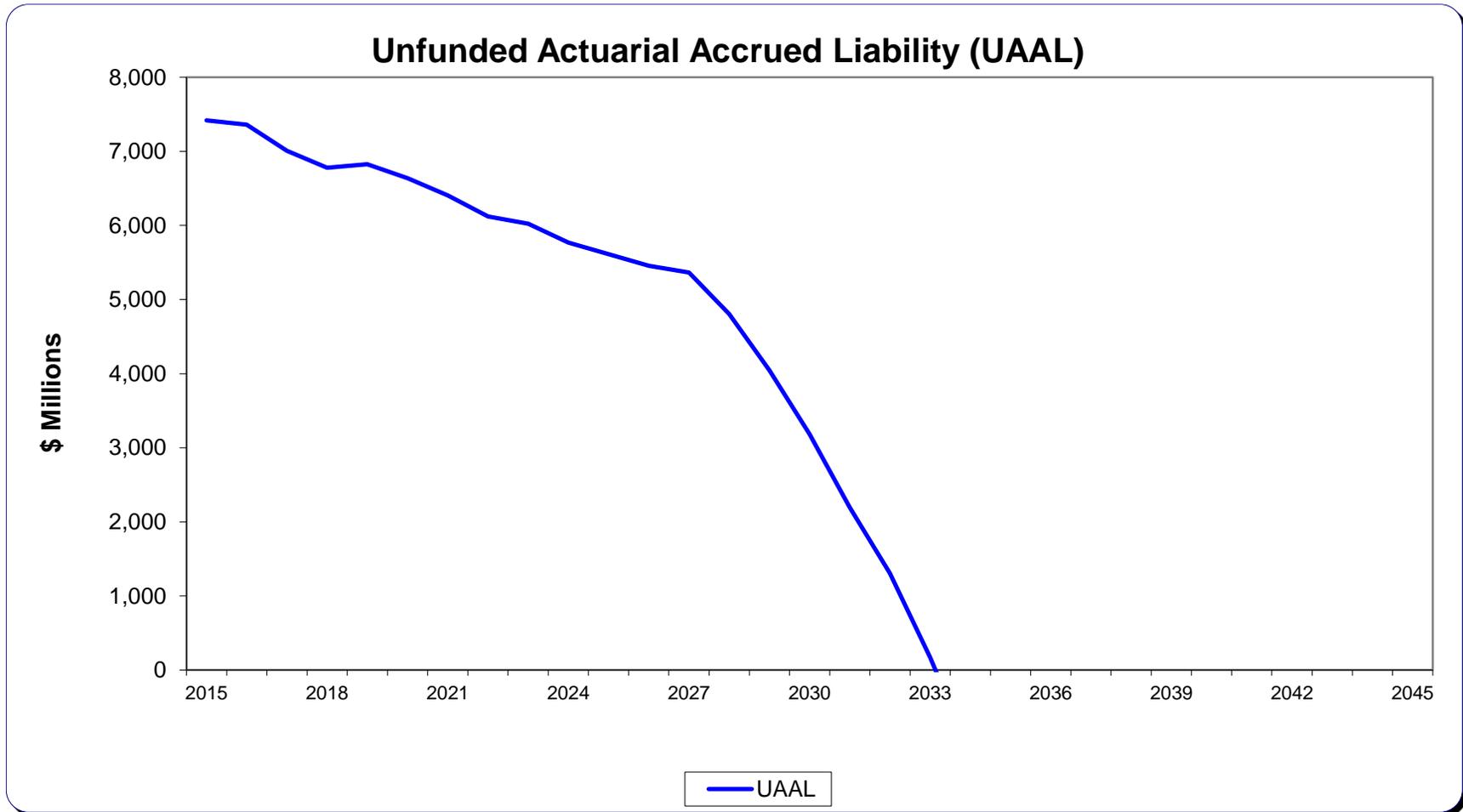
Exhibit F-3
9.5% Actual Investment Return in Future Years

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.
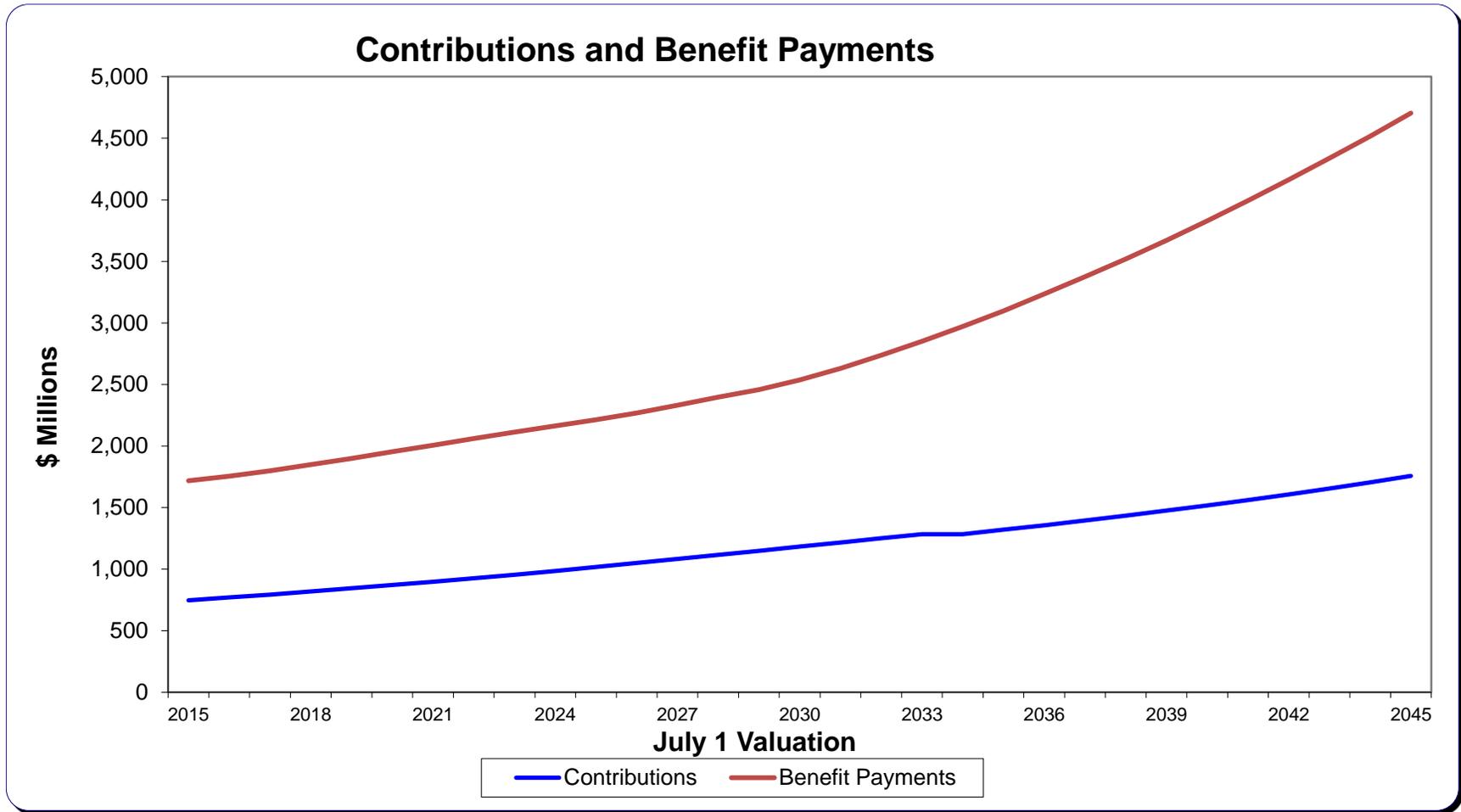
Teachers Retirement Association of Minnesota
Exhibit G
9.5% Actual Investment Return in Future Years

July 1	Asset Values Actuarial	Asset Values Market	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Funded Ratio	Contribution Rates Statutory	Contribution Rates Required	Contribution Rates Sufficiency/ (Deficiency)	Total Contributions	Benefit Payments
2015	$19,696.89	$20,441.99	$27,117.55	$7,420.65	73%	15.97%	21.65%	-5.68%	$745.26	$1,718.32
2016	20,604.64	21,365.75	27,964.32	7,359.68	74%	15.94%	21.42%	-5.48%	769.53	1,754.38
2017	21,845.77	22,364.94	28,854.81	7,009.04	76%	15.92%	20.88%	-4.96%	792.85	1,797.59
2018	23,008.94	23,438.22	29,786.89	6,777.95	77%	15.90%	20.51%	-4.61%	817.81	1,847.56
2019	23,929.74	24,587.31	30,757.11	6,827.37	78%	15.88%	20.61%	-4.73%	843.56	1,898.96
2020	25,129.25	25,818.71	31,767.76	6,638.51	79%	15.85%	20.38%	-4.53%	869.90	1,952.34
2021	26,415.14	27,138.79	32,820.22	6,405.07	80%	15.83%	20.11%	-4.28%	897.08	2,006.55
2022	27,795.70	28,556.01	33,917.45	6,121.74	82%	15.81%	19.79%	-3.98%	925.16	2,060.38
2023	29,281.27	30,080.91	35,302.85	6,021.58	83%	15.79%	20.03%	-4.24%	954.50	2,112.43
2024	30,884.95	31,726.91	36,652.79	5,767.84	84%	15.78%	19.89%	-4.11%	985.16	2,163.29
2025	32,620.58	33,508.15	38,231.99	5,611.41	85%	15.76%	19.98%	-4.22%	1,016.84	2,214.14
2026	34,501.68	35,438.54	39,957.44	5,455.76	86%	15.74%	20.10%	-4.36%	1,049.16	2,267.97
2027	36,539.61	37,529.81	41,906.41	5,366.81	87%	15.72%	20.40%	-4.68%	1,081.93	2,330.14
2028	38,741.03	39,788.99	43,546.78	4,805.74	89%	15.71%	19.86%	-4.15%	1,115.11	2,395.56
2029	41,118.64	42,229.05	45,164.15	4,045.50	91%	15.69%	18.95%	-3.26%	1,148.59	2,458.04
2030	43,692.64	44,870.58	46,875.65	3,183.01	93%	15.68%	17.76%	-2.08%	1,182.21	2,535.92
2031	46,465.82	47,716.73	48,660.57	2,194.75	95%	15.66%	16.10%	-0.44%	1,215.86	2,630.17
2032	49,440.27	50,769.86	50,746.15	1,305.88	97%	15.65%	14.38%	1.27%	1,249.74	2,737.85
2033	52,621.65	54,035.81	52,793.04	171.39	100%	15.64%	11.28%	4.36%	1,284.03	2,850.29
2034	56,025.42	57,530.24	54,912.29	-1,113.13	102%	15.20%	5.94%	9.26%	1,283.24	2,970.35
2035	59,628.52	61,230.19	57,102.47	-2,526.05	104%	15.20%	0.00%	15.20%	1,319.31	3,097.48
2036	63,481.45	65,186.35	59,363.65	-4,117.79	107%	15.20%	0.00%	15.20%	1,356.21	3,234.42
2037	67,598.63	69,413.64	61,690.94	-5,907.69	110%	15.20%	0.00%	15.20%	1,394.21	3,375.54
2038	72,002.07	73,934.63	64,086.27	-7,915.80	112%	15.20%	0.00%	15.20%	1,433.72	3,519.25
2039	76,717.85	78,776.09	66,553.81	-10,164.04	115%	15.20%	0.00%	15.20%	1,474.70	3,669.71
2040	81,770.16	83,962.90	69,093.62	-12,676.50	118%	15.20%	0.00%	15.20%	1,516.96	3,828.41
2041	87,183.85	89,520.61	71,703.75	-15,480.10	122%	15.20%	0.00%	15.20%	1,560.69	3,993.01
2042	92,988.75	95,479.84	74,384.93	-18,603.82	125%	15.20%	0.00%	15.20%	1,606.22	4,162.60
2043	99,218.84	101,875.38	77,139.23	-22,079.61	129%	15.20%	0.00%	15.20%	1,653.80	4,337.30
2044	105,911.42	108,745.46	79,968.82	-25,942.60	132%	15.20%	0.00%	15.20%	1,703.79	4,516.95
2045	113,107.88	116,132.52	82,876.13	-30,231.75	136%	15.20%	0.00%	15.20%	1,756.01	4,704.68

Results are based on specified investment return and all other actuarial assumptions being met each year in the future. Please refer to the accompanying letter from Cavanaugh Macdonald dated January 25, 2016 for important details regarding assumptions and methodology.