



Cavanaugh Macdonald
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Teachers' and State Employees' Retirement System Actuarially Determined Employer Contributions (ADEC) Projections for the State System

January 29, 2020 Board of Trustees Meeting

Larry Langer, ASA, FCA, EA, MAAA

Jonathan Craven, ASA, FCA, EA, MAAA



Valuation Results

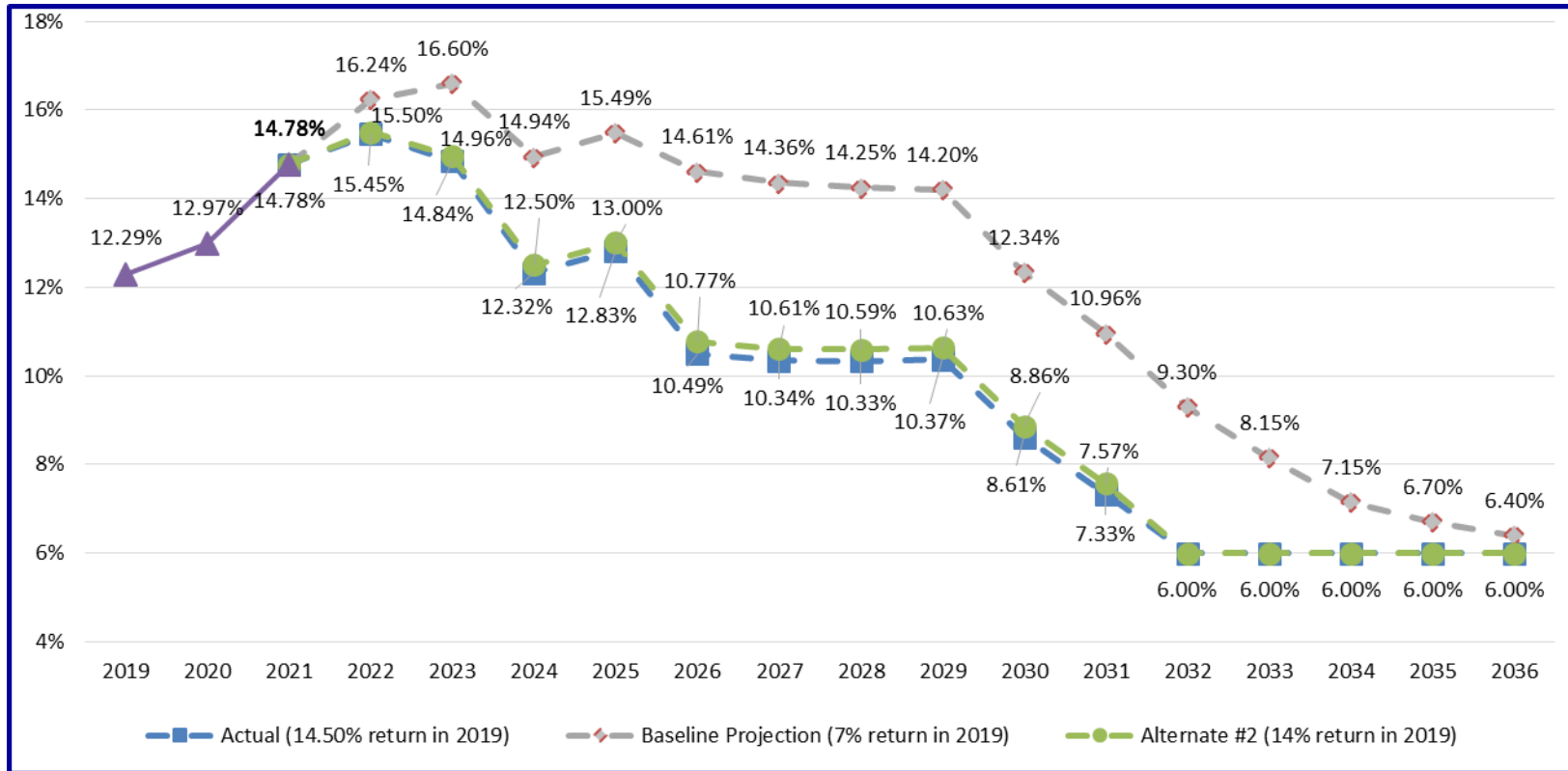
Projections



- Projections of contribution requirements and funded status into the future can be helpful planning tools for stakeholders. This section provides such projections. The projections of the actuarial valuation are known as deterministic projections. Deterministic projections are based on one scenario in the future. The baseline deterministic projection is based on December 31, 2018 valuation results as assumptions.
- Key Projection Assumptions
 - Valuation interest rate of 7.00% for all years in conjunction with direct rate smoothing of the employer contribution rate over a 3-year period beginning July 1, 2019.
 - 7.00% investment return on market value of assets
 - Actuarial assumptions and methods as described in Appendix D. All future demographic experience is assumed to be exactly realized.
 - The contribution rate under the Employer Contribution Rate Stabilization Policy (ECRSP) is contributed until fiscal year ending 2022.
 - The actuarially determined employer contribution rate is contributed for fiscal years ending 2023 and beyond.
 - 0% increase in the total active member population
 - No cost-of-living adjustments granted
 - Future pay increases based on long-term salary increase assumptions
- The ECRSP adopted by the Board of Trustees on January 21, 2016 requires that recommended contributions be 0.35% of payroll greater than the appropriated contribution during the prior year, with the following bounds: (1) contributions may not be less than the actuarially determined employer contribution (ADEC) rate and (2) contributions may not be greater than a contribution determined using the same assumptions used to calculate the ADEC but using a discount rate equal to the long-term Treasury bond yield.
- In addition, we have provided one alternate deterministic projection. The alternate deterministic projection is based on the same assumptions as the baseline deterministic projection except that it is based asset return of 14.5% for calendar year 2019. The preliminary return of 14.5% for calendar year 2019 was provided by RSD Staff.

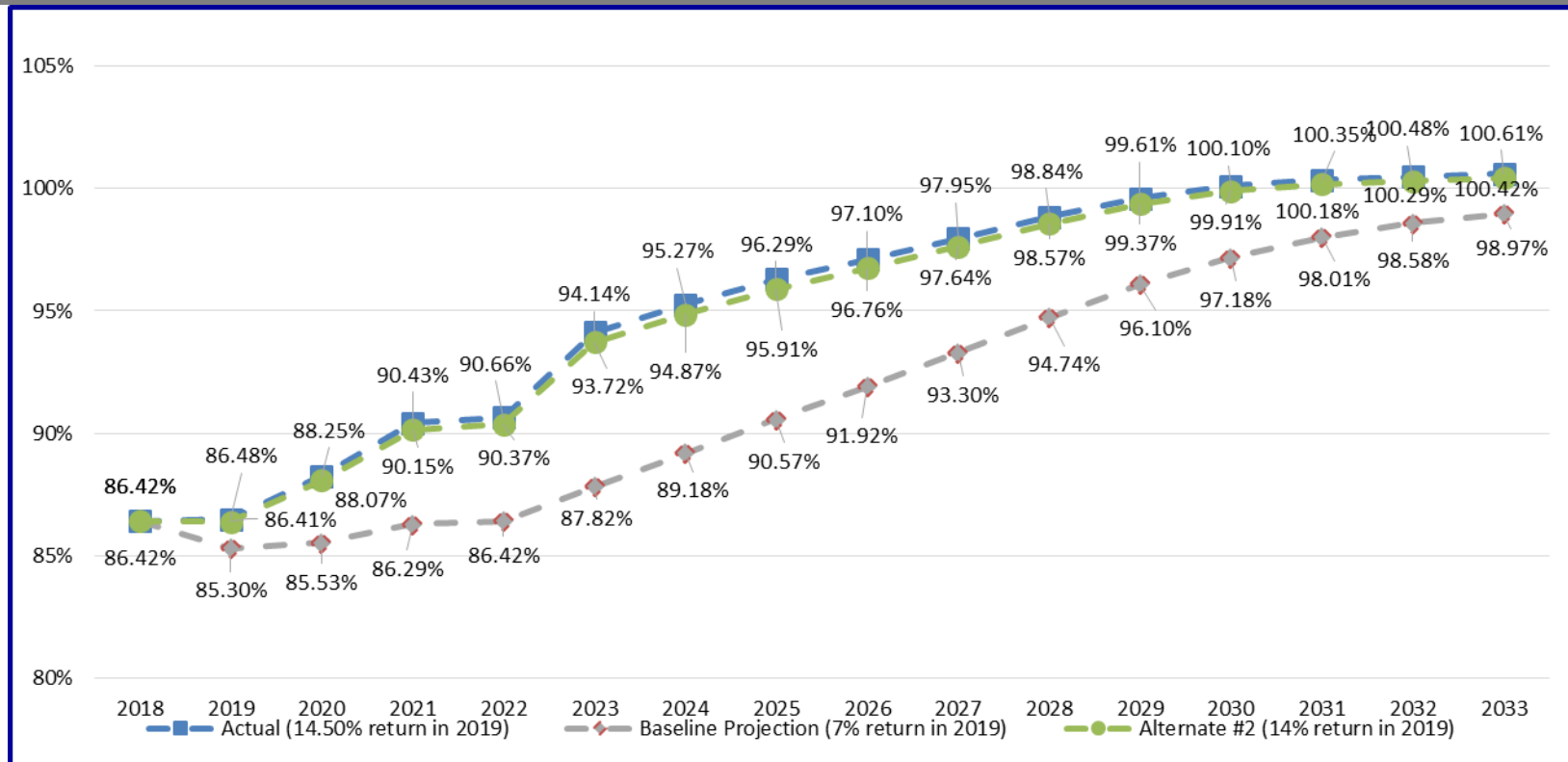
Valuation Results

Projected Contribution Rates



Estimated returns were 7.5% higher than expected. As a result we are projecting that the unfunded actuarial accrued liability will be lower resulting in lower employer contribution rates.

Projected Funded Ratio



Estimated returns were 7.5% higher than expected. As a result we are projecting that the unfunded actuarial accrued liability will be lower resulting in a higher funded ratios.

Certification



Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. Because of limited scope, Cavanaugh Macdonald performed no analysis of the potential range of such future differences, except for some limited analysis in financial projections or required disclosure information. Results prior to December 31, 2018 were provided by the prior consulting actuary.

We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about it.

Larry Langer, ASA, EA, FCA, MAAA
Principal and Consulting Actuary

Jonathan T. Craven, ASA, EA, FCA, MAAA
Consulting Actuary

APPENDIX

Fiscal Year Contribution Projection Baseline



Baseline Projection (7% return in 2019)

Fiscal Year Ending	Employer Contribution Rate	Employer Contributions	Member Contributions	Benefit Payments (Val Year)
6/30/2021	14.78%	2,392,685,000	971,320,000	5,431,967,000
6/30/2022	16.24%	2,696,195,000	996,131,000	5,572,563,000
6/30/2023	16.60%	2,828,147,000	1,022,222,000	5,720,677,000
6/30/2024	14.94%	2,613,372,000	1,049,547,000	5,878,930,000
6/30/2025	15.49%	2,783,507,000	1,078,182,000	6,048,043,000
6/30/2026	14.61%	2,698,309,000	1,108,135,000	6,230,061,000
6/30/2027	14.36%	2,726,847,000	1,139,351,000	6,415,828,000
6/30/2028	14.25%	2,783,253,000	1,171,896,000	6,608,852,000
6/30/2029	14.20%	2,853,890,000	1,205,869,000	6,806,211,000
6/30/2030	12.34%	2,552,899,000	1,241,280,000	7,009,562,000
6/30/2031	10.96%	2,334,728,000	1,278,136,000	6,621,397,000
6/30/2032	9.30%	2,040,646,000	1,316,546,000	6,833,687,000
6/30/2033	8.15%	1,842,798,000	1,356,661,000	7,046,450,000
6/30/2034	7.15%	1,666,577,000	1,398,526,000	7,255,958,000
6/30/2035	6.70%	1,610,519,000	1,442,256,000	7,464,896,000
6/30/2036	6.40%	1,587,127,000	1,487,932,000	7,668,694,000
6/30/2037	6.00%	1,535,651,000	1,535,651,000	7,869,205,000
6/30/2038	6.00%	1,585,608,000	1,585,608,000	8,063,828,000

Fiscal Year Contribution Projection Alternate #1



Alternate #1 (14.5% return in 2019)

Fiscal Year Ending	Employer Contribution Rate	Employer Contributions	Member Contributions	Benefit Payments (Val Year)
6/30/2021	14.78%	2,392,685,000	971,320,000	5,431,967,000
6/30/2022	15.45%	2,565,037,000	996,131,000	5,572,563,000
6/30/2023	14.84%	2,528,296,000	1,022,222,000	5,720,677,000
6/30/2024	12.32%	2,155,070,000	1,049,547,000	5,878,930,000
6/30/2025	12.83%	2,305,513,000	1,078,182,000	6,048,043,000
6/30/2026	10.49%	1,937,389,000	1,108,135,000	6,230,061,000
6/30/2027	10.34%	1,963,482,000	1,139,351,000	6,415,828,000
6/30/2028	10.33%	2,017,614,000	1,171,896,000	6,608,852,000
6/30/2029	10.37%	2,084,144,000	1,205,869,000	6,806,211,000
6/30/2030	8.61%	1,781,237,000	1,241,280,000	7,009,562,000
6/30/2031	7.33%	1,561,456,000	1,278,136,000	6,621,397,000
6/30/2032	6.00%	1,316,546,000	1,316,546,000	6,833,687,000
6/30/2033	6.00%	1,356,661,000	1,356,661,000	7,046,450,000
6/30/2034	6.00%	1,398,526,000	1,398,526,000	7,255,958,000
6/30/2035	6.00%	1,442,256,000	1,442,256,000	7,464,896,000
6/30/2036	6.00%	1,487,932,000	1,487,932,000	7,668,694,000
6/30/2037	6.00%	1,535,651,000	1,535,651,000	7,869,205,000
6/30/2038	6.00%	1,585,608,000	1,585,608,000	8,063,828,000

Asset and Liability Projection Baseline



Baseline Projection (7% return in 2019)

Valuation Year	Market Value of Assets	Actuarial Value of Assets	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
12/31/2018	67,536,480,000	70,959,093,000	82,105,943,000	11,146,850,000	86.42%
12/31/2019	69,643,281,000	71,688,848,000	84,042,649,000	12,353,801,000	85.30%
12/31/2020	72,027,861,000	73,571,384,000	86,014,544,000	12,443,160,000	85.53%
12/31/2021	74,785,635,000	75,953,454,000	88,019,534,000	12,066,080,000	86.29%
12/31/2022	77,825,161,000	77,825,161,000	90,051,277,000	12,226,116,000	86.42%
12/31/2023	80,889,224,000	80,889,224,000	92,105,498,000	11,216,274,000	87.82%
12/31/2024	83,982,249,000	83,982,249,000	94,171,949,000	10,189,700,000	89.18%
12/31/2025	87,175,291,000	87,175,291,000	96,251,743,000	9,076,452,000	90.57%
12/31/2026	90,393,346,000	90,393,346,000	98,340,253,000	7,946,907,000	91.92%
12/31/2027	93,708,614,000	93,708,614,000	100,434,975,000	6,726,361,000	93.30%
12/31/2028	97,145,157,000	97,145,157,000	102,534,210,000	5,389,053,000	94.74%
12/31/2029	101,142,842,000	101,142,842,000	105,252,536,000	4,109,694,000	96.10%
12/31/2030	104,968,578,000	104,968,578,000	108,014,596,000	3,046,018,000	97.18%
12/31/2031	108,615,997,000	108,615,997,000	110,826,031,000	2,210,034,000	98.01%
12/31/2032	112,086,951,000	112,086,951,000	113,697,484,000	1,610,533,000	98.58%
12/31/2033	115,433,011,000	115,433,011,000	116,636,502,000	1,203,491,000	98.97%
12/31/2034	118,725,020,000	118,725,020,000	119,656,291,000	931,271,000	99.22%
12/31/2035	122,044,427,000	122,044,427,000	122,770,345,000	725,918,000	99.41%
12/31/2036	125,403,973,000	125,403,973,000	125,995,135,000	591,162,000	99.53%
12/31/2037	128,851,894,000	128,851,894,000	129,349,376,000	497,482,000	99.62%
12/31/2038	132,455,158,000	132,455,158,000	132,849,026,000	393,868,000	99.70%

Asset and Liability Projection Alternate #1



Alternate #1 (14.5% return in 2019)

Valuation Year	Market Value of Assets	Actuarial Value of Assets	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
12/31/2018	67,536,480,000	70,959,093,000	82,105,943,000	11,146,850,000	86.42%
12/31/2019	74,618,224,000	72,683,836,000	84,042,649,000	11,358,813,000	86.48%
12/31/2020	77,351,050,000	75,909,607,000	86,014,544,000	10,104,937,000	88.25%
12/31/2021	80,414,480,000	79,592,322,000	88,019,534,000	8,427,212,000	90.43%
12/31/2022	83,626,262,000	81,636,285,000	90,051,277,000	8,414,992,000	90.66%
12/31/2023	86,705,415,000	86,705,415,000	92,105,498,000	5,400,083,000	94.14%
12/31/2024	89,721,519,000	89,721,519,000	94,171,949,000	4,450,430,000	95.27%
12/31/2025	92,677,613,000	92,677,613,000	96,251,743,000	3,574,130,000	96.29%
12/31/2026	95,492,545,000	95,492,545,000	98,340,253,000	2,847,708,000	97.10%
12/31/2027	98,374,055,000	98,374,055,000	100,434,975,000	2,060,920,000	97.95%
12/31/2028	101,343,178,000	101,343,178,000	102,534,210,000	1,191,032,000	98.84%
12/31/2029	104,837,584,000	104,837,584,000	105,252,536,000	414,952,000	99.61%
12/31/2030	108,122,976,000	108,122,976,000	108,014,596,000	(108,380,000)	100.10%
12/31/2031	111,216,458,000	111,216,458,000	110,826,031,000	(390,427,000)	100.35%
12/31/2032	114,241,722,000	114,241,722,000	113,697,484,000	(544,238,000)	100.48%
12/31/2033	117,346,867,000	117,346,867,000	116,636,502,000	(710,365,000)	100.61%
12/31/2034	120,546,413,000	120,546,413,000	119,656,291,000	(890,122,000)	100.74%
12/31/2035	123,854,442,000	123,854,442,000	122,770,345,000	(1,084,097,000)	100.88%
12/31/2036	127,288,580,000	127,288,580,000	125,995,135,000	(1,293,445,000)	101.03%
12/31/2037	130,868,424,000	130,868,424,000	129,349,376,000	(1,519,048,000)	101.17%
12/31/2038	134,612,845,000	134,612,845,000	132,849,026,000	(1,763,819,000)	101.33%