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KPERS

Presentation of December 31, 2019 Valuation Results

July 24, 2020

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Discussion Topics

- Background
- Detail of Valuation Results
- Projections of Future Valuation Results
- Risk Assessment and Evaluation (as required by Actuarial Standard of Practice Number 51)

Actuarial Valuation Process
"Reserve Funding"

- Build funds during working careers
- Investment returns help pay for benefits
- Actuarial valuation is mathematical model of financial future of system
- Actuarial cost method's goal, as approved by the Board, is level contributions as percent of payroll

Inputs

Membership Data
Asset Data
Benefit Provisions
Assumptions
Funding Methodology

↓

Results

Actuarial Value of Assets
Actuarial Liability
UAL/Funded Ratio
Net Actuarial Gain or Loss
Employer Contributions
Projections

Events Impacting the 12/31/2019 Valuation Results

- No legislation in 2020 session
- Additional contributions in 2019, but anticipated in prior valuation results ($115 in March 2019 and $51 million in July 2019)
- Net investment return of 17.1% on market value of assets. Due to actuarial asset smoothing method, the return on actuarial assets was 6.7%, less than the assumption of 7.75%.
- Reflects changes to the demographic assumptions from the experience study while prior set of economic assumptions was retained by the Board.
  - In our professional judgment, the economic assumptions do not comply with actuarial standards.
  - Valuation results using an alternate set of economic assumptions are disclosed in the report (page 3).

Impact of Assumption Changes

	Prior Assumptions	New Assumptions	Change
State/School			
• UAL ($M)	$6,634	$6,591	$(43)
• Contribution Rate	19.97%	19.84%	(0.13%)
Local			
• UAL($M)	$1,527	$1,523	($4)
• Contribution Rate	14.98%	14.89%	(0.09%)
KP&F			
• UAL($M)	$947	$943	($4)
• Contribution Rate	30.10%	30.03%	(0.07%)
Judges			
• UAL($M)	$10.8	$10.3	($0.5)
• Contribution Rate	23.90%	23.40%	(0.50%)

Key Findings

- Valuation results
  - All groups remain at the full Actuarial Required Contribution rate
  - Total System funded ratio increased from 68.4% last year to 70.0% this year
  - Total unfunded actuarial liability decreased from $9.2 billion last year to $9.0 billion this year
  - Change in employer contribution rate varied by group
    - State/School decreased 0.23%
    - Judges decreased 0.63%
    - Local increased 0.03%
    - KP&F increased 0.19%

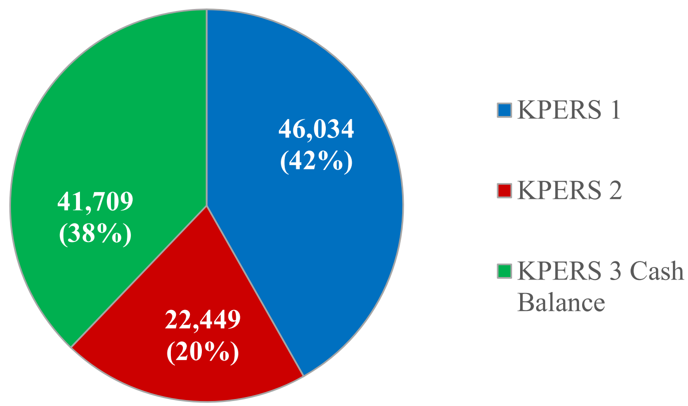
Total Active Members

	12/31/2019	12/31/2018	Change
State	21,239	20,893	1.7%
School	88,953	87,245	2.0%
State/School	110,192	108,138	1.9%
Local	38,007	37,966	0.1%
KP&F	7,797	7,695	1.3%
Judges	257	256	0.4%
Total	156,253	154,055	1.4%

With the increase in active membership, total covered payroll increased as expected for Local and more than expected for State/School and KP&F.

KPERS Membership by Tier

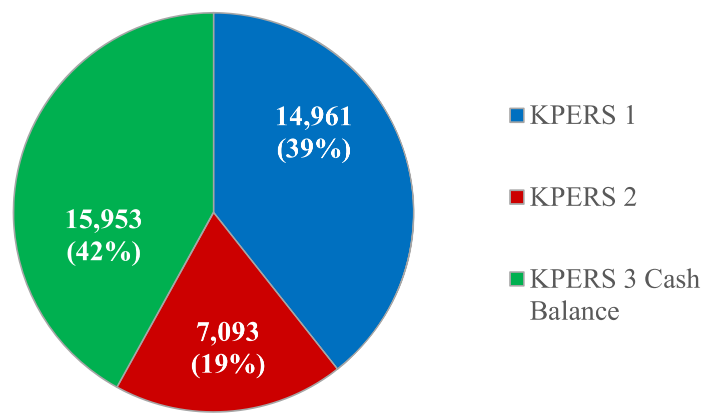
State/School Active Membership



Total: 110,192

KPERS 1: Hired before 7/1/09
KPERS 2: Hired after 6/30/09
and before 1/1/15
KPERS 3 Cash Balance: Hired on/after 1/1/15

Local Active Membership



Total: 38,007

Actuarial Value of Assets

- Market value not used directly in valuation
- Actuarial asset valuation method used to smooth the effect of market fluctuations
  - Goal is to provide more stability in contribution rates
  - Smoothed value is called “actuarial value of assets” and is used in all of the measurements in the valuation
- Method approved by Board recognizes market value experience above or below the 7.75% investment return assumption equally over 5 years

Annual Change in System's Asset Values ($M)

	Market	Actuarial
Value at 12/31/18	$ 18,670	$ 19,898
▪ Employer and Member Contributions	1,466	1,466
▪ Additional Contributions	166	166
▪ Benefit Payments	(1,877)	(1,877)
▪ Investment Income, Net of Expenses	3,118	1,323
Value at 12/31/19	$ 21,543	$ 20,976
Net Rate of Return	17.1%*	6.7%

* As reported by KPERS

The return on actuarial value of 6.7% was lower than expected, resulting in an actuarial loss.

Development of 12/31/2019 Unfunded Actuarial Liability

	Actuarial Liability (AL) ($M)	Actuarial Value of Assets ($M)	Unfunded Actuarial Liability ($M)	Funded Ratio
State	$ 4,604	$ 3,642	$ 962	79%
School	15,901	10,318	5,583	65%
State/School	20,505	13,960	6,545	68%
Local	5,705	4,202	1,502	74%
KP&F	3,578	2,628	949	73%
Judges	196	185	10	95%
Total*	$ 29,982	$ 20,976	$ 9,007	70%

* Totals may not add due to rounding

Year-over-Year Change in Funded Ratio

	December 31	
	2019	2018
State	79.1%	79.4%
School	64.9%	62.3%
State/School	68.1%	66.1%
Local	73.7%	72.7%
KP&F	73.5%	73.0%
Judges	94.7%	94.4%
Total System	**70.0%**	**68.4%**

Overall, the funded ratio for the entire system increased to 70.0%.

Note: based on valuation assumptions for each valuation date.

Development of Employer Contribution Rates

(12/31/2019 valuation applies to FY beginning in 2022)

	State	School	State/School	Local
Total Normal Cost Rate	7.59%	7.98%	7.90%	7.43%
Unfunded Actuarial Liability Contribution	8.49%	12.85%	11.96%	7.47%
Total Actuarial Contribution Rate	**16.08%**	**20.83%**	**19.86%**	**14.90%**
Less Member Rate	(6.00%)	(6.00%)	(6.00%)	(6.00%)
Employer Actuarial Required Contribution Rate	**10.08%**	**14.83%**	**13.86%**	**8.90%**

Due to the repayment of the delayed contributions from FY 2017 and FY 2019, the School group has an additional contribution of $25.8M in FY 2021 (0.68%), in FY 2022 (0.64%) and in FY 2023 (0.61%). The additional contributions are scheduled to occur as level dollar amounts until FY 2040.

Development of Employer Contribution Rates

(12/31/2019 valuation applies to FY beginning in 2022)

	KP&F	Judges
Total Normal Cost Rate	14.87%	20.25%
Unfunded Actuarial Liability Contribution Rate	15.27%	3.15%
Total Actuarial Contribution Rate	**30.14%**	**23.40%**
Less Member Rate	(7.15%)	(5.63%)
Employer Actuarial Required Contribution Rate	**22.99%**	**17.77%**

Actuarial vs. Statutory Employer Contribution Rates

(Fiscal Years Beginning in 2022)

	December 31, 2019		
	Actuarial	Statutory	Shortfall
State	10.08%	13.86%	(3.78%)*
School	14.83%	13.86%	0.97%
State/School	13.86%	13.86%	0.00%
Local	8.90%	8.90%	0.00%
KP&F	22.99%	22.99%	0.00%
Judges	17.77%	17.77%	0.00%

* As provided in statute, the contribution above the State Actuarial Required Contribution (ARC) rate will be used to fund the School Group.

Note: State/School continues to be at the ARC rate in FY 2023 (12/31/2019 valuation) at 13.86%.

FUNDING PROJECTIONS

Funding Projections

- Not precise predictions but general estimates
  - Preliminary model results – final review in process
- Projections based on many assumptions
  - 7.75% return on market value in calendar year 2020 and all future years
  - All other actuarial assumptions met in the future
  - Current plan provisions in place during projection period
  - Employer contributions are paid based on the certified contribution rates (subject to statutory caps) and current funding policy
  - New entrants in future years are assumed to be similar to recent history

State/School Funding

➢ December 31, 2019 Valuation

Funded Ratio:	68.1%
Actuarial required rate:	13.86%
Statutory rate:	13.86%

➢ Actuarial Required Contribution (ARC) Date/Rate (actuarial and statutory contribution rates are equal) occurred in 12/31/2017 valuation at 14.23%

- Continues to be at full actuarial contribution rate (13.86%) in 12/31/19 valuation (FY 2023)
- Actuarial contribution rate declined, primarily due to assumption changes and payroll growth higher than expected
- The projected contribution rate declines as the net deferred investment gains are recognized and then stabilizes around 13% of pay until the legacy unfunded actuarial liability is funded.

Local Funding

- December 31, 2019 Valuation
  - Funded ratio: 73.7%
  - Actuarial rate: 8.90%
  - Statutory rate: 8.90%
- Actuarial Required Contribution Date/Rate occurred in 12/31/12 valuation (setting the calendar year 2015 contribution rate)
  - Continues to be at full actuarial contribution rate in the 12/31/19 valuation
  - Actuarial required contribution rate held fairly steady, increasing from 8.87% in last year's valuation to 8.90% in this year's valuation.
  - The projected contribution rate declines as the deferred investment gains are recognized and stabilizes around 8% of pay until the legacy unfunded actuarial liability is funded.

KP&F Funding

- December 31, 2019 Valuation
  - Funded ratio: 73.5%
  - Actuarial rate: 22.99%
  - Statutory rate: 22.99%
- Full Actuarial Required Contribution Rate contributed each year
  - Actuarial required contribution rate increased from 22.80% in last year's valuation to 22.99% in this year's valuation largely due to a return lower than 7.75% on the actuarial assets due to the actuarial asset smoothing method.
  - The projected contribution rate declines slightly as the net deferred investment gains are recognized and then is stable around 21.50% of pay until the legacy unfunded actuarial liability is funded.

Judges System

- December 31, 2019 Valuation
  - Funded ratio: 94.7%
  - Actuarial rate: 17.77%
  - Statutory rate: 17.77%
- Full Actuarial Required Contribution Rate contributed each year
  - Actuarial required contribution rate decreased from 18.40% in last year's valuation to 17.77% in this year's valuation, primarily due to the assumption changes (i.e., retirement rates).
  - Projected employer contribution rates decline as the net investment gains are recognized and stabilizes around 14% of pay until the legacy unfunded actuarial liability is funded.

Short Term Projections (Total System)

Return in 2020*

	7.75%		0%		- 7.75%	
Valuation Date (12/31)	Unfunded Actuarial Liability(M)	Funded Ratio	Unfunded Actuarial Liability(M)	Funded Ratio	Unfunded Actuarial Liability(M)	Funded Ratio
2019	$9,007	70%	$9,007	70%	$9,007	70%
2020	8,666	72%	8,995	71%	9,324	70%
2021	8,297	74%	9,083	71%	9,869	69%
2022	8,107	75%	9,360	71%	10,612	67%

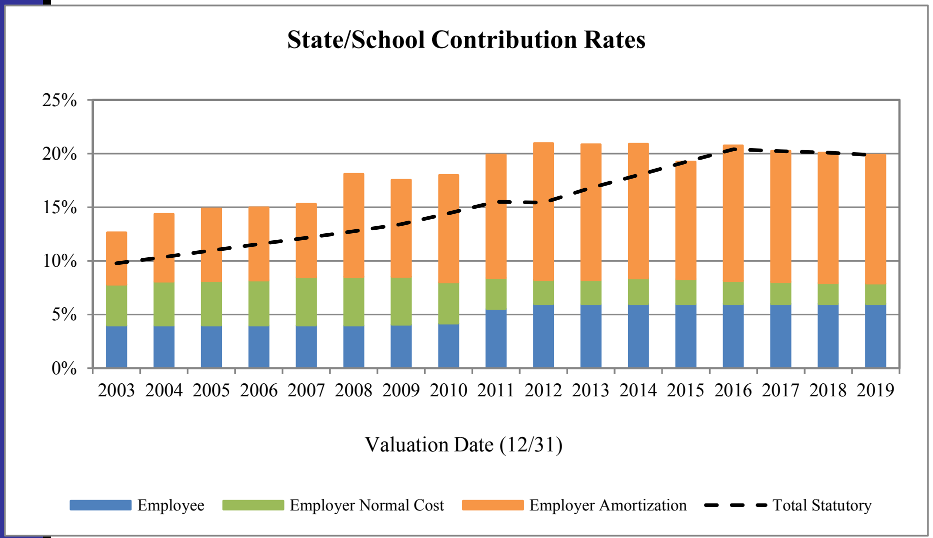
- Assumes a 7.75% return in all years after 2020 so current deferred investment experience is reflected in future years. Also assumes delayed contributions for FY 2017 and FY 2019 are repaid as scheduled.

RISK CONSIDERATIONS

Risk Considerations

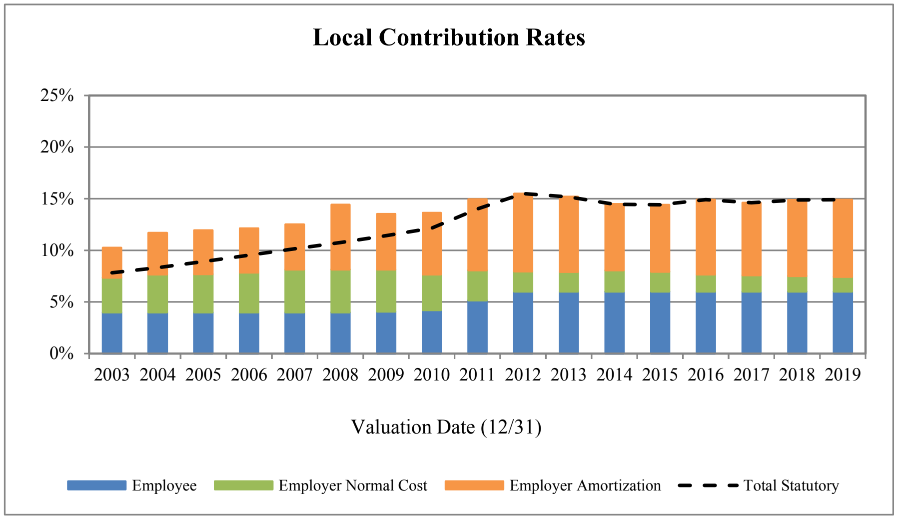
- Actuarial Standard of Practice No. 51 requires actuaries to identify and disclose risks faced by pension plans and sponsors
  - Risk is related to actual events not occurring as expected – favorable or unfavorable
- Common risks include:
  - Investment return risk
  - Demographic risk (mortality is a key risk)
  - Funding policy risk - contributions may be insufficient to fund the benefits

Risk and Funding Policy



The statutory rate was lower than the actuarial rate beginning with the 1994 State/School valuation. The statutory and actuarial rates first converged in the 12/31/17 valuation (contribution rate effective 7/1/2020). The statutory rate has continued to be equal to the actuarial rate in the 2018 and 2019 valuations.

The Local group reached the ARC rate in the 12/31/2012 valuation (calendar year 2015) and has remained at the full actuarial rate since that time.



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Unfundeded Actuarial Liability

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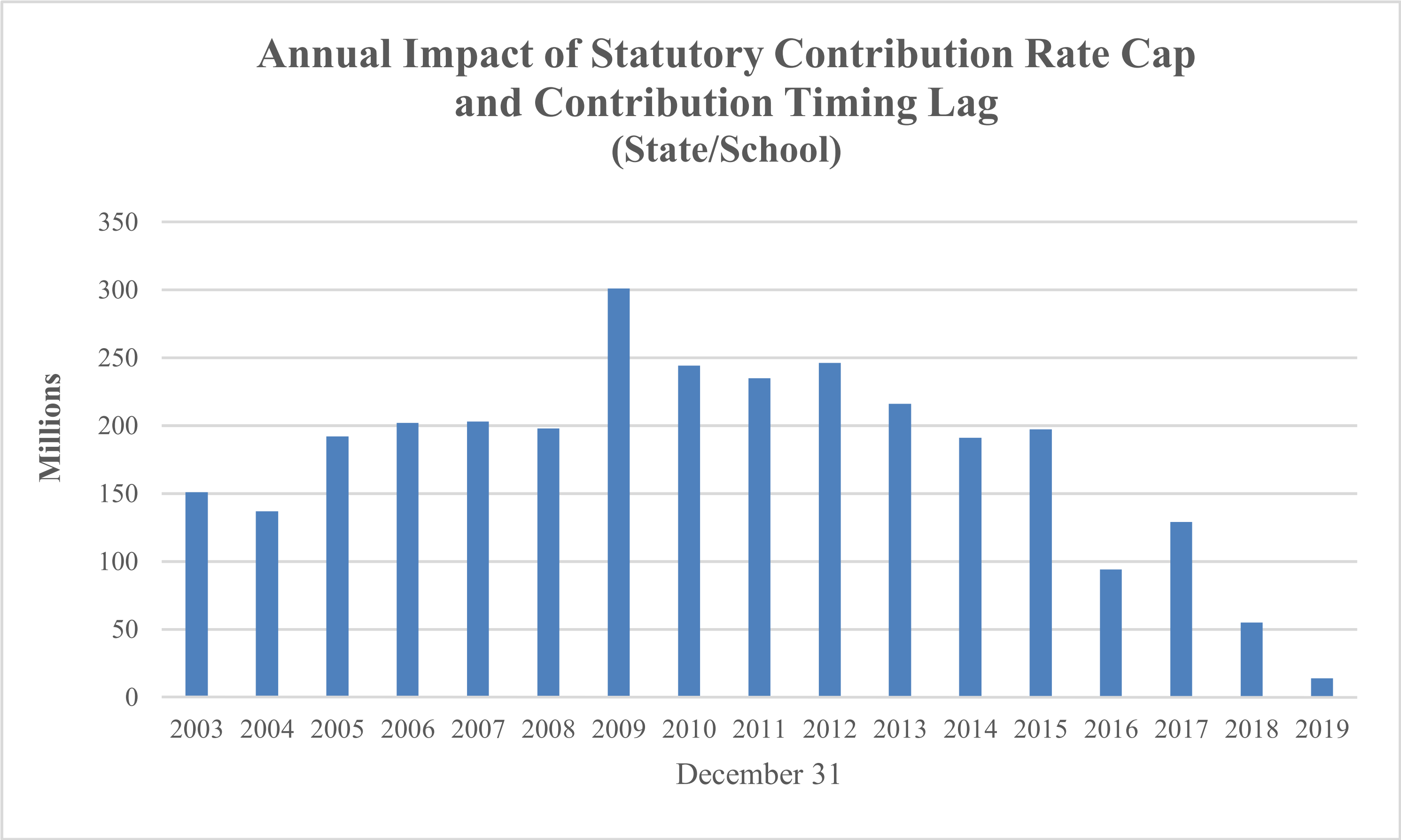
- Any shortfall between the statutory contribution rate and the actuarial required contribution rate (ARC) results in an increase in the Unfunded Actuarial Liability
- Employer contribution shortfall has been significant and has occurred over a long period
- The employer contribution shortfall is the largest single factor in the growth of the unfunded actuarial liability over the last 25 years

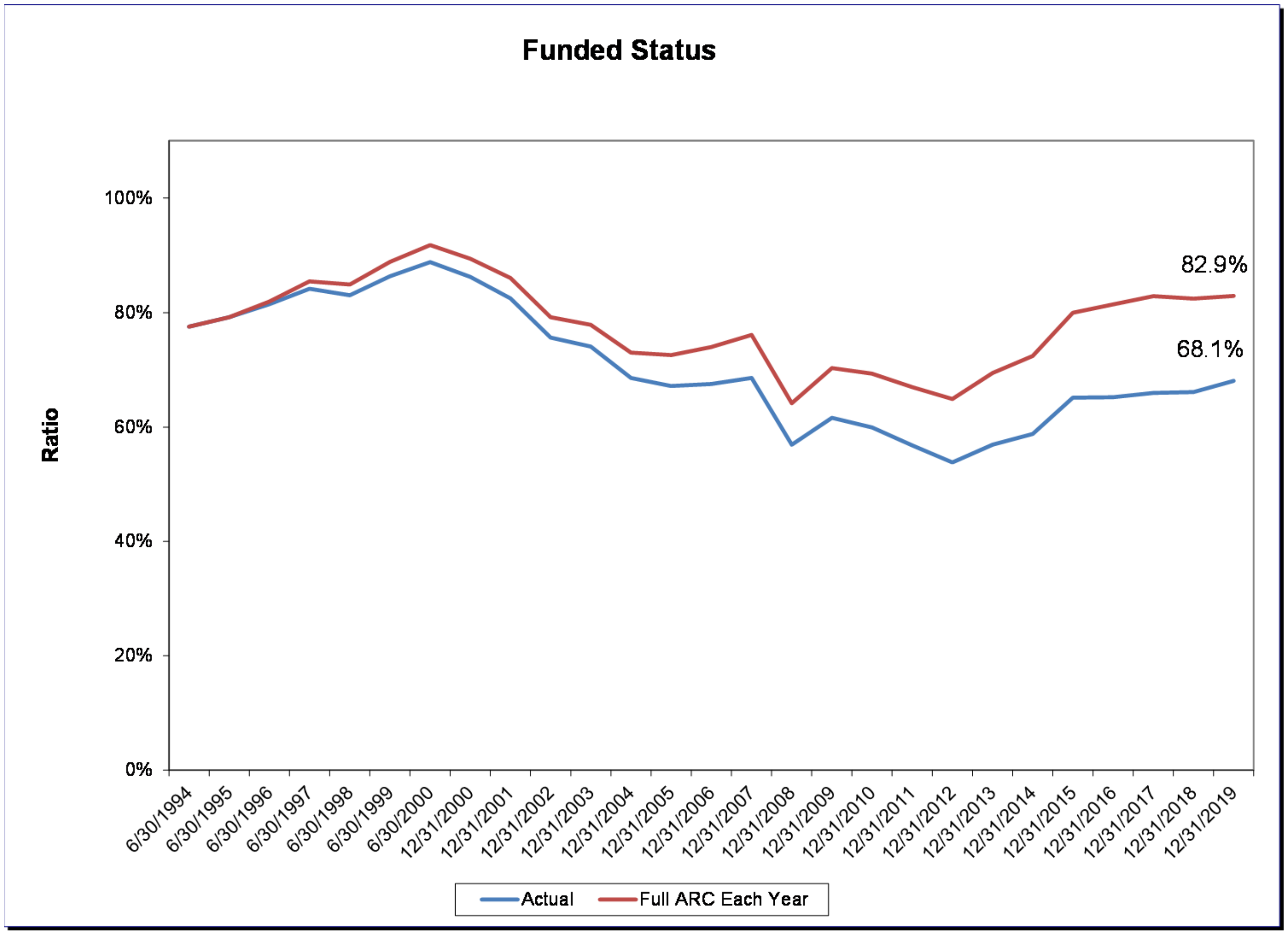
Unfunded Actuarial Liability



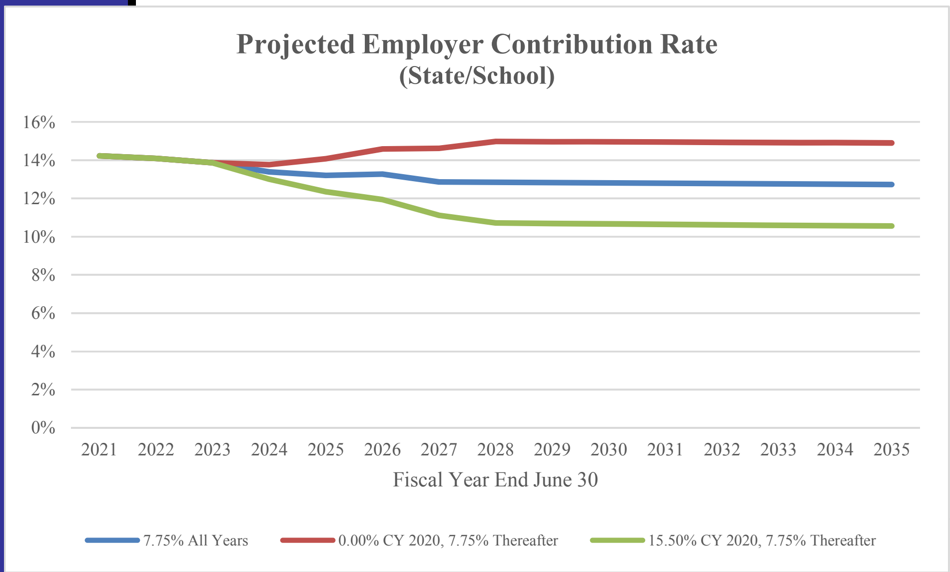
Note: amounts are not additive as they are measured at different points in time.

Risk and Funding Policy
State/School Funding

With a 40 year amortization plan, the State/School Group would be about 83% funded if the full actuarial contribution had been made since 1993.



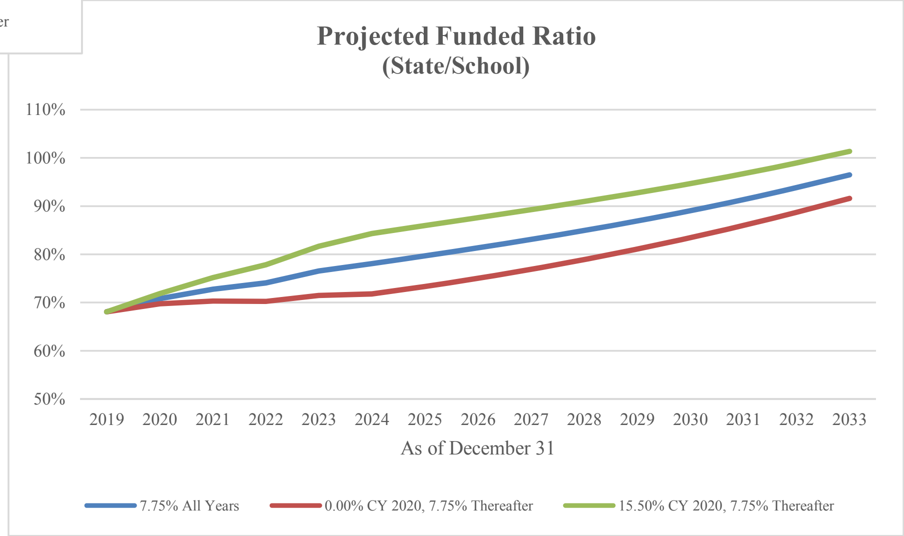
Investment Return Risk



A one-time deviation of actual experience from the investment return assumption, either positive or negative, can have a significant impact on future valuation results.

Alternate Scenarios for 2020 Return:
Red line: 0.00%
Blue line: 7.75%
Green line: 15.50%

Projections assume 7.75% return in all years after 2020.



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Summary Comments

- Strong return in 2019 improved the projected funding outlook
- COVID-19 is unknown at this time
  - Investment return for 2020 and beyond
  - Mortality experience in 2020
  - Potential changes in retirement experience particularly for teachers
  - Loss of revenue by state and other employers may impact their ability to pay the full contribution
- The pandemic is an example of why the actuarial community is expanding their communication of pension funding risks

Actuarial Certification

We, Patrice A. Beckham, FSA and Brent A. Banister, FSA are consulting actuaries with Cavanaugh Macdonald Consulting, LLC. We are members of the American Academy of Actuaries, Fellows of the Society 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 or provide additional information as needed.

Sincerely,

Patrice Beckham

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