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KPERS

Presentation of December 31, 2020 Valuation Results

July 23, 2021

Presented by: Cavanaugh Macdonald Consulting, LLC

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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
Unfunded Actuarial Liability
Funded Ratio
Net Actuarial Gain or Loss
Employer Contributions
Projections

Events Impacting the 12/31/2020 Valuation Results

- HB 2405 provided for net proceeds of up to $500 million in bonds to improve the School's funded status
  - SB 159 recertified State/School rates from 14.09% to 13.33% for FY 2022 and from 13.86% to 13.11% for FY 2023
  - Since the 12/31/2020 valuation sets the contribution rate for FY 2024, the expected bond proceeds are reflected in the projected unfunded actuarial liability as of July 1, 2023, and the corresponding unfunded actuarial liability contribution rate.

- HB 2063 improved survivor benefits for Tier 2 KP&F members who become disabled due to service-related causes.

- Two other policies affecting experience study timing and extending the DROP election period were passed but did not impact the December 31, 2020 valuation results.

Events Impacting the 12/31/2020 Valuation Results

- Net investment return of 11.1% on market value of assets and 9.3% on actuarial assets was higher than the assumed return of 7.75% (which produced an actuarial gain).

- Liability experience: varied by group but aggregate actuarial loss.

- Employer contribution rate for State/School group was very close to full actuarial rate (shortfall was $8 million).

Key Findings

- Valuation results
  - All groups remain at the full Actuarial Required Contribution rate
  - Total System funded ratio increased from 70% last year to 73% this year (bond proceeds are not reflected due to valuation date of December 31, 2020)
  - Total unfunded actuarial liability decreased from $9.0 billion last year to $8.5 billion this year
  - Favorable return on actuarial assets <u>decreased</u> the employer contribution rate for all groups
    - State/School: (0.54%)
    - Local: (0.47%)
    - KP&F: (0.13%)
    - Judges: (1.29%)

DECEMBER 31, 2020
VALUATION RESULTS

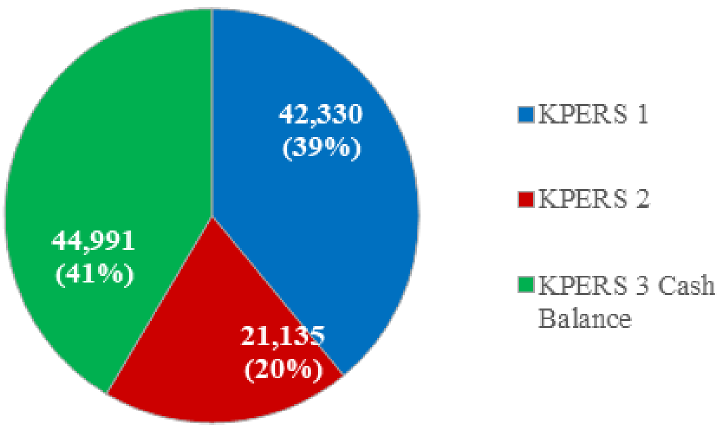
Total Active Members

	12/31/2020	12/31/2019	Change
State	20,796	21,239	(2.1%)
School	87,660	88,953	(1.5%)
State/School	108,456	110,192	(1.6%)
Local	37,424	38,007	(1.5%)
KP&F	7,835	7,797	0.5%
Judges	244	257	(5.1%)
Total	153,959	156,253	(1.5%)

With the decrease in active membership, total covered payroll increased less than the 3% expected increase for State/School.

KPERS Membership by Tier

State/School Active Membership

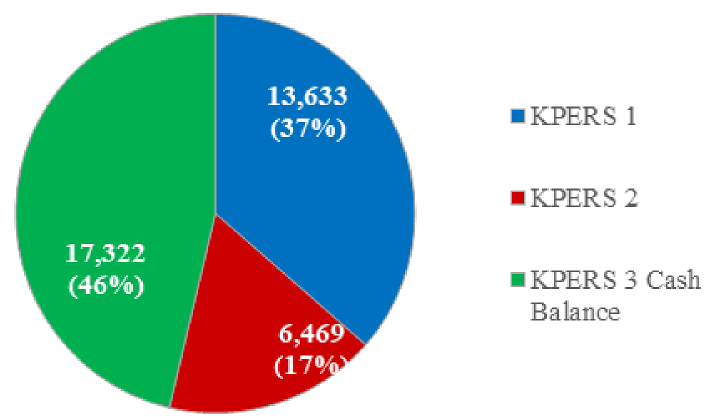


For the first time, KPERS 3 is the largest group of active members.

Total State/School: 108,456

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 Local: 37,424

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 12/31/19	$ 21,543	$ 20,976
▪ Employer and Member Contributions	1,478	1,478
▪ Additional Contributions	0	0
▪ Benefit Payments*	(1,954)	(1,954)
▪ Investment Income, Net of Expenses	2,286	1,922
Value at 12/31/20	$ 23,353	$ 22,422
Net Rate of Return	11.1%**	9.3%

* Includes monthly benefits, partial lump sum payments, refunds, and death benefits.
** As reported by KPERS

The return on actuarial value of 9.3% was higher than expected, resulting in an actuarial gain.

Development of 12/31/2020 Unfunded Actuarial Liability

	Actuarial Liability (AL) ($M)	Actuarial Value of Assets ($M)	Unfunded Actuarial Liability ($M)	Funded Ratio
State	$ 4,675	$ 3,789	$ 886	81%
School	16,385	11,127	5,257	68%
State/School	21,060	14,916	6,143	71%
Local	5,928	4,509	1,420	76%
KP&F	3,722	2,803	919	75%
Judges	201	194	6	97%
Total*	$ 30,910	$ 22,422	$ 8,488	73%

* Totals may not add due to rounding

Year-over-Year Change in Funded Ratio

	December 31	
	2020	2019
State	81.0%	79.1%
School	67.9%	64.9%
State/School	70.8%	68.1%
Local	76.1%	73.7%
KP&F	75.3%	73.5%
Judges	96.8%	94.7%
Total System	**72.5%**	**70.0%**

Overall, the funded ratio for the entire system increased to 72.5%.

Development of Employer Contribution Rates

(12/31/2020 valuation applies to FY beginning in 2023)

	State	School	State/School	Local
Total Normal Cost Rate	7.39%	7.83%	7.74%	7.26%
Unfunded Actuarial Liability Contribution	7.99%	11.55%	10.83%	7.17%
Total Actuarial Contribution Rate	**15.38%**	**19.38%**	**18.57%**	**14.43%**
Less Member Rate	(6.00%)	(6.00%)	(6.00%)	(6.00%)
Employer Actuarial Required Contribution Rate	**9.38%**	**13.38%**	**12.57%**	**8.43%**

Due to repayment of the delayed contributions from FY 2017 and FY 2019, the School group has an additional contribution of $6.4 million and $19.4 million respectively. The additional contributions are scheduled to occur as level dollar amounts over 20 years commencing in FY 2018 and FY 2020, respectively. These payments increase the School contribution rates in FY 2022 by 0.64%, in FY 2023 by 0.61% and in FY 2024 by 0.60%.

Development of Employer Contribution Rates

(12/31/2020 valuation applies to FY beginning in 2023)

	KP&F	Judges
Total Normal Cost Rate	15.02%	20.32%
Unfunded Actuarial Liability Contribution Rate	14.99%	1.79%
Total Actuarial Contribution Rate	**30.01%**	**22.11%**
Less Member Rate	(7.15%)	(5.63%)
Employer Actuarial Required Contribution Rate	**22.86%**	**16.48%**

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Actuarial vs. Statutory Employer Contribution Rates

(Fiscal Years Beginning in 2023)

	December 31, 2020		
	Actuarial	Statutory	Shortfall
State	9.38%	12.57%	(3.19%)*
School	13.38%	12.57%	0.81%
State/School	12.57%	12.57%	**0.00%**
Local	8.43%	8.43%	**0.00%**
KP&F	22.86%	22.86%	**0.00%**
Judges	16.48%	16.48%	**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 2024 (12/31/2020 valuation) at 12.57%.

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 2021 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

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State/School Funding

- December 31, 2020 Valuation
  - Funded Ratio: 70.8%
  - Actuarial required rate: 12.57%
  - Statutory rate: 12.57%

- 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 (12.57%) in 12/31/20 valuation (FY 2024 contribution rate).
  - Actuarial contribution rate declined from 13.11% to 12.57%, primarily due to favorable investment experience.
  - The projected contribution rate declines as the net deferred investment gains are recognized and then stabilizes around 11.4% of pay until the legacy unfunded actuarial liability is funded.

Local Funding

- December 31, 2020 Valuation
  - Funded ratio: 76.1%
  - Actuarial rate: 8.43%
  - Statutory rate: 8.43%
- 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 (8.43%) in the 12/31/20 valuation (CY 2023).
  - Actuarial contribution rate declined from 8.90% to 8.43%, primarily due to favorable investment experience.
  - The projected contribution rate declines as the net deferred investment gains are recognized and stabilizes around 7.5% of pay until the legacy unfunded actuarial liability is funded.

KP&F Funding

- December 31, 2020 Valuation
  - Funded ratio: 75.3%
  - Actuarial rate: 22.86%
  - Statutory rate: 22.86%
- Full Actuarial Required Contribution Rate contributed each year
  - Actuarial contribution rate declined from 22.99% to 22.86%, primarily due to favorable investment experience.
  - The projected contribution rate declines slightly as the net deferred investment gains are recognized and then is stable around 21.5% of pay until the legacy unfunded actuarial liability is funded.

Judges System

- December 31, 2020 Valuation
  - Funded ratio: 96.8%
  - Actuarial rate: 16.48%
  - Statutory rate: 16.48%
- Full Actuarial Required Contribution Rate contributed each year
  - Actuarial required contribution rate decreased from 17.77% in last year's valuation to 16.48% in this year's valuation, primarily due to favorable investment experience.
  - Projected employer contribution rates decline as the net investment gains are recognized and stabilizes around 12% of pay until the legacy unfunded actuarial liability is funded.

Short Term Projections (Total System)

Return in 2021*

Valuation Date (12/31)	7.75% Unfunded Actuarial Liability(M)	7.75% Funded Ratio	0% Unfunded Actuarial Liability(M)	0% Funded Ratio	- 7.75% Unfunded Actuarial Liability(M)	- 7.75% Funded Ratio
2020	$8,488	73%	$8,488	73%	$8,488	73%
2021	7,422	77%	7,783	75%	8,143	74%
2022	7,037	78%	7,898	76%	8,759	73%
2023	6,224	81%	7,596	77%	8,968	73%

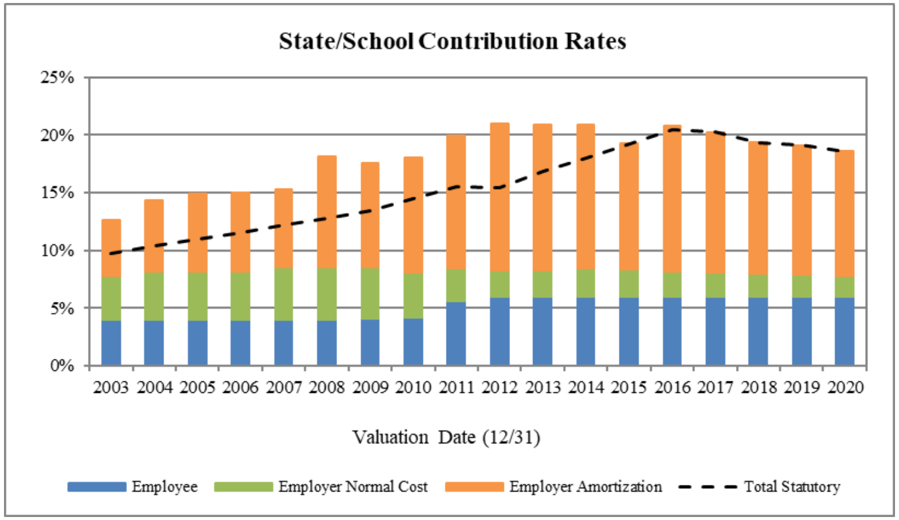
- Assumes a 7.75% return in all years after 2021 so current deferred investment experience is reflected in future years. Also assumes delayed contributions for FY 2017 and FY 2019 are repaid as scheduled.

RISK CONSIDERATIONS

Risk Considerations

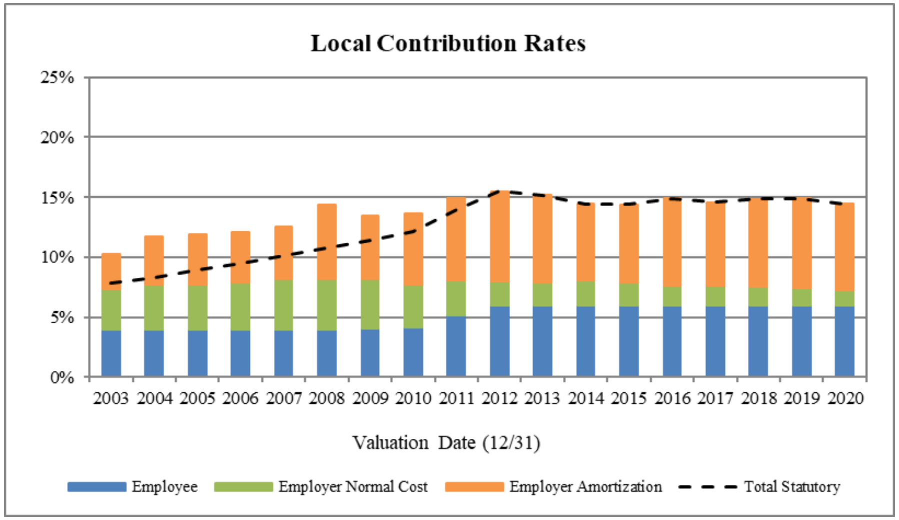
- Actuarial Standard of Practice No. 51 requires actuaries to identify and disclose risks faced by pension plans and sponsors
  - Actuarial perspective: risk translates as “uncertainty”
  - Risk is related to actual events not occurring as anticipated by assumptions – favorable or unfavorable
- Common 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

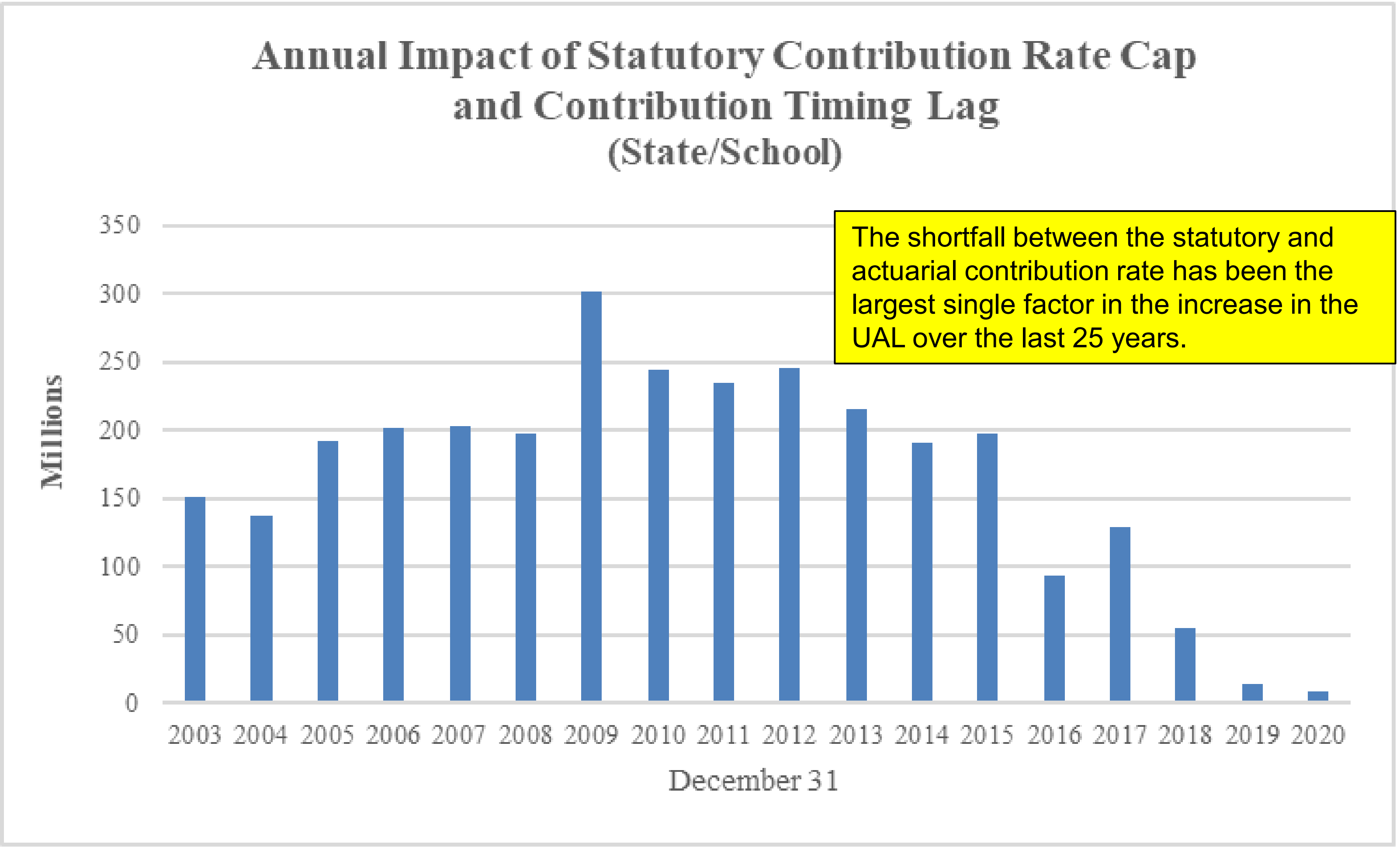


The statutory rate was lower than the actuarial rate beginning with the 1994 State/School valuation. The statutory and actuarial rates first converged in the 12/31/17 valuation (contribution rate FY 2021). The statutory rate has continued to be equal to the actuarial rate since that time.

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.



Unfunded Actuarial Liability



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

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Risk and Funding Policy
State/School Funding

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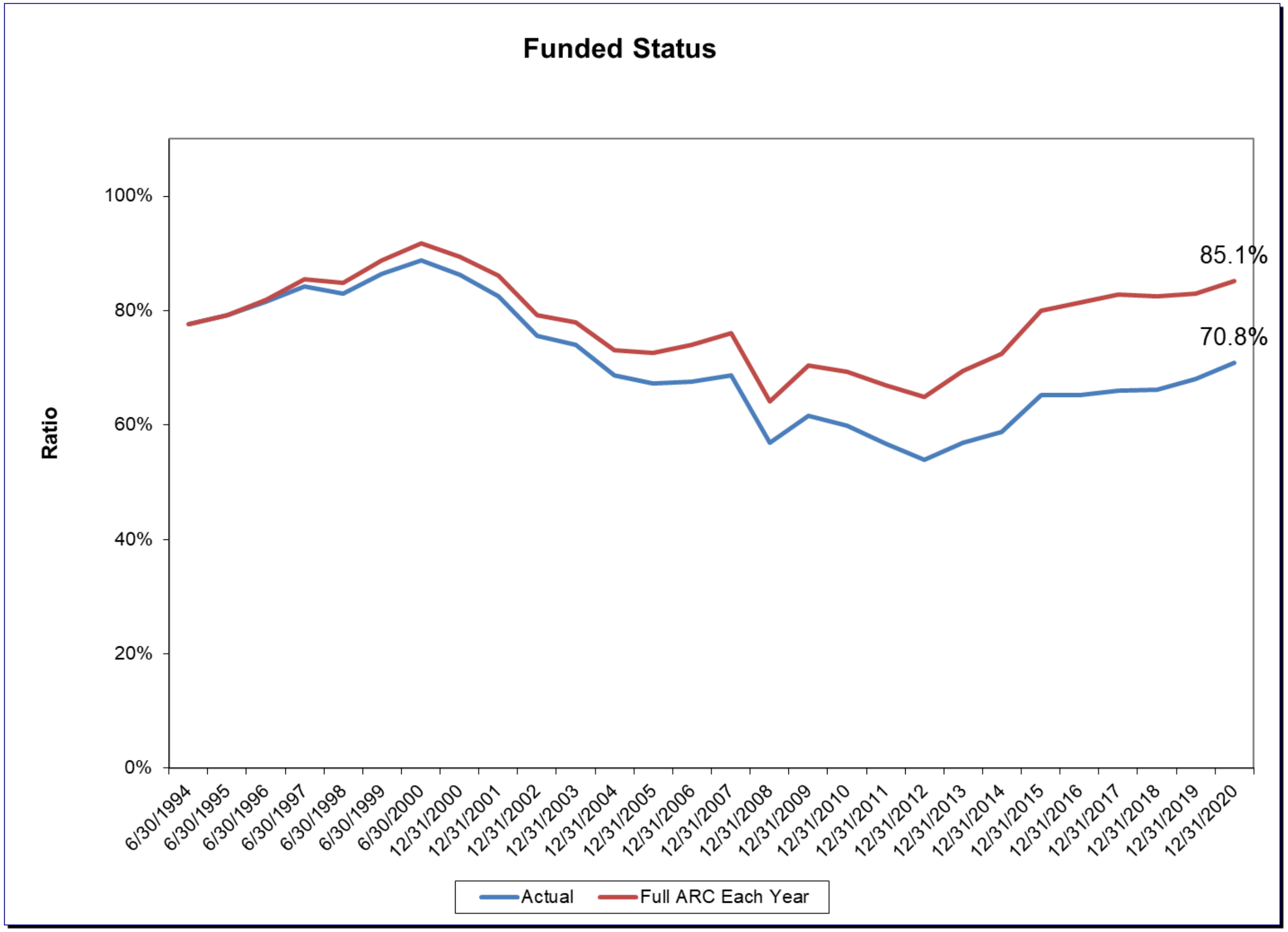
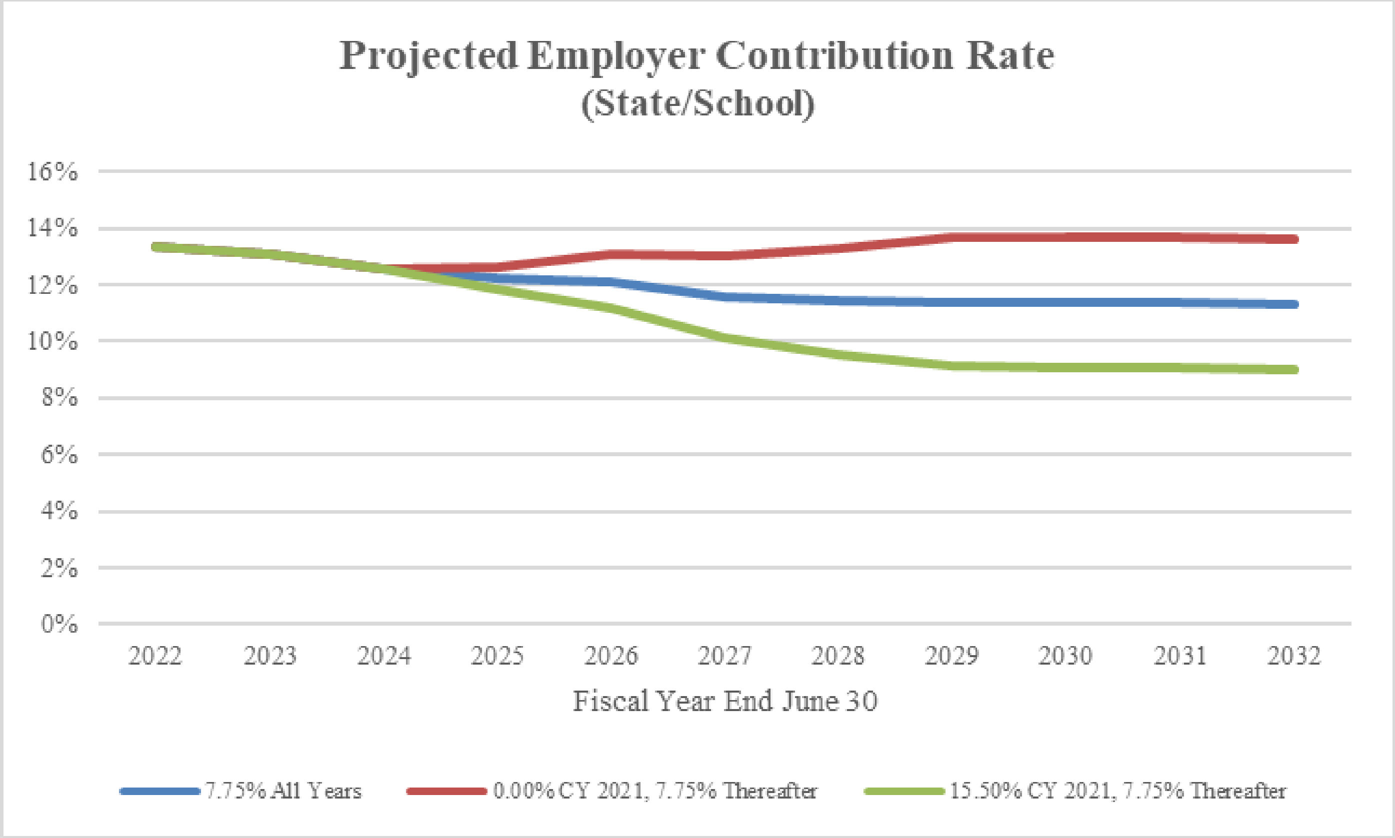
With a 40-year amortization plan, the State/School Group would be about 85% funded if the full actuarial contribution had been made since 1993.



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.

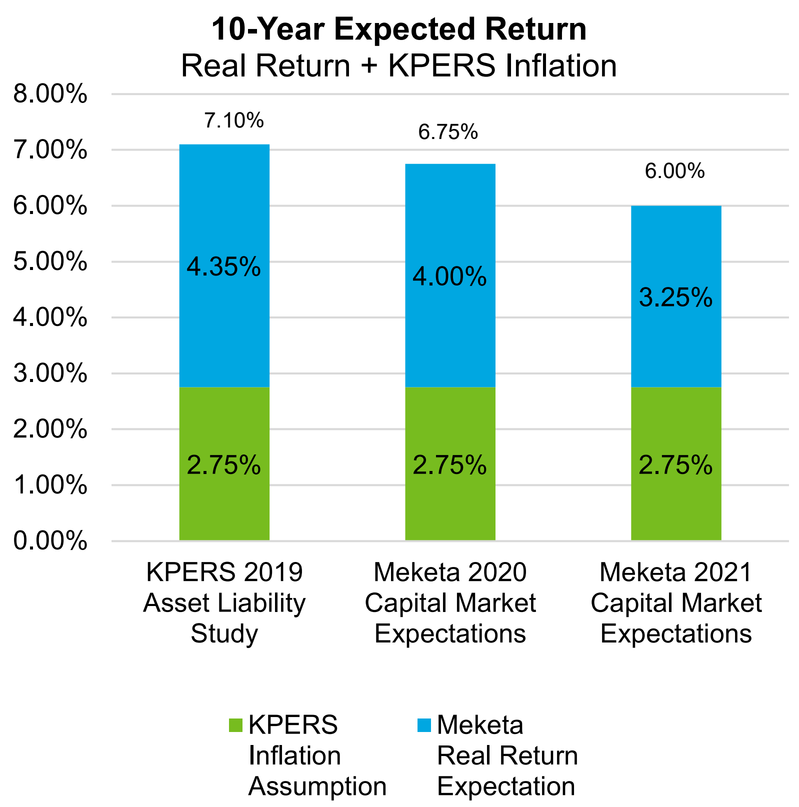


Assumed Returns and Expected Returns

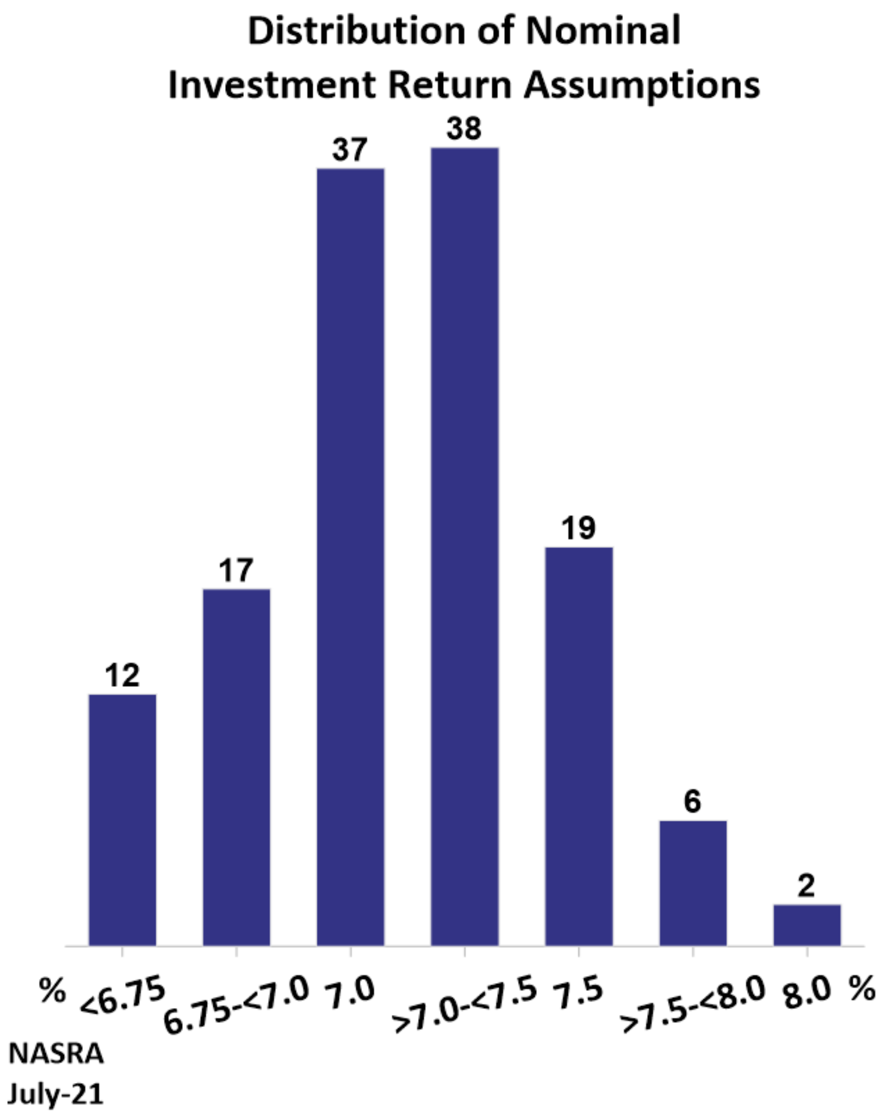
- Meketa's (KPERS general investment consultant) capital market expectations have trended downward since the 2019 asset liability study.

- The gap between the 7.75% actuarial assumed rate of return and the capital market expectation has increased from 0.65% in 2019 to 1.75% in the most recent data.

- The size and the direction of the gap between the assumed return and the expected return is a concern.



Distribution of Return Assumptions
(July 2021)



Only 8 of the 131 Plans in the Survey use an investment return assumption above 7.5%. In 2019, there were 19 Plans.

Economic Assumptions

- Valuation reflects the Board's set of assumptions.
  - In our professional judgment, the economic assumptions are not reasonable and do not comply with actuarial standards of practice (ASOP).
  - Valuation results using an alternate set of economic assumptions are disclosed in the report (page 5) and summarized on the next slide.
  - Alternate set of economic assumptions <u>is illustrative only</u>:
    - Inflation: 2.5%
    - Investment return: 7.0%
    - General wage increase: 3.0%
- Further discussion with the Board is recommended before the next valuation is performed

Impact of Alternate Set of Economic Assumptions

	Current Assumptions	Revise Assumptions*	Change
State/School			
• UAL ($M)	$6,143	$7,684	$1,541
• Employer Contribution	12.57%	15.74%	3.17%
Local			
• UAL($M)	$1,417	$1,857	$440
• Employer Contribution	8.43%	10.82%	2.39%
KP&F			
• UAL($M)	$917	$1,205	$288
• Employer Contribution	22.86%	28.19%	5.33%
Judges			
• UAL($M)	$6.5	$19.1	$12.6
• Employer Contribution	16.48%	23.06%	6.58%

* 7.0% investment return assumption and 2.5% inflation assumption.

Summary Comments

- Strong return in 2020 and $500M in bond proceeds improved the projected funding outlook

- While things are much better than a year ago, the future COVID impact is still an unknown
  - The pandemic is an example of why the actuarial community is expanding their communication of pension funding risks.

- Actual investment experience is the single most important factor in improving the System's funded status

Actuarial Certification

I, Patrice A. Beckham, FSA, am a consulting actuary with Cavanaugh Macdonald Consulting, LLC. I am a member of the American Academy of Actuaries, Fellow of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. I am available to answer any questions or provide additional information as needed.

Sincerely,

Patrice Beckham

Patrice A. Beckham, FSA, EA, FCA, MAAA

Principal and Consulting Actuary