SUMMARY OF ACTUARIAL REPORTS

OKLAHOMA STATE PENSION COMMISSION

March 12, 2020

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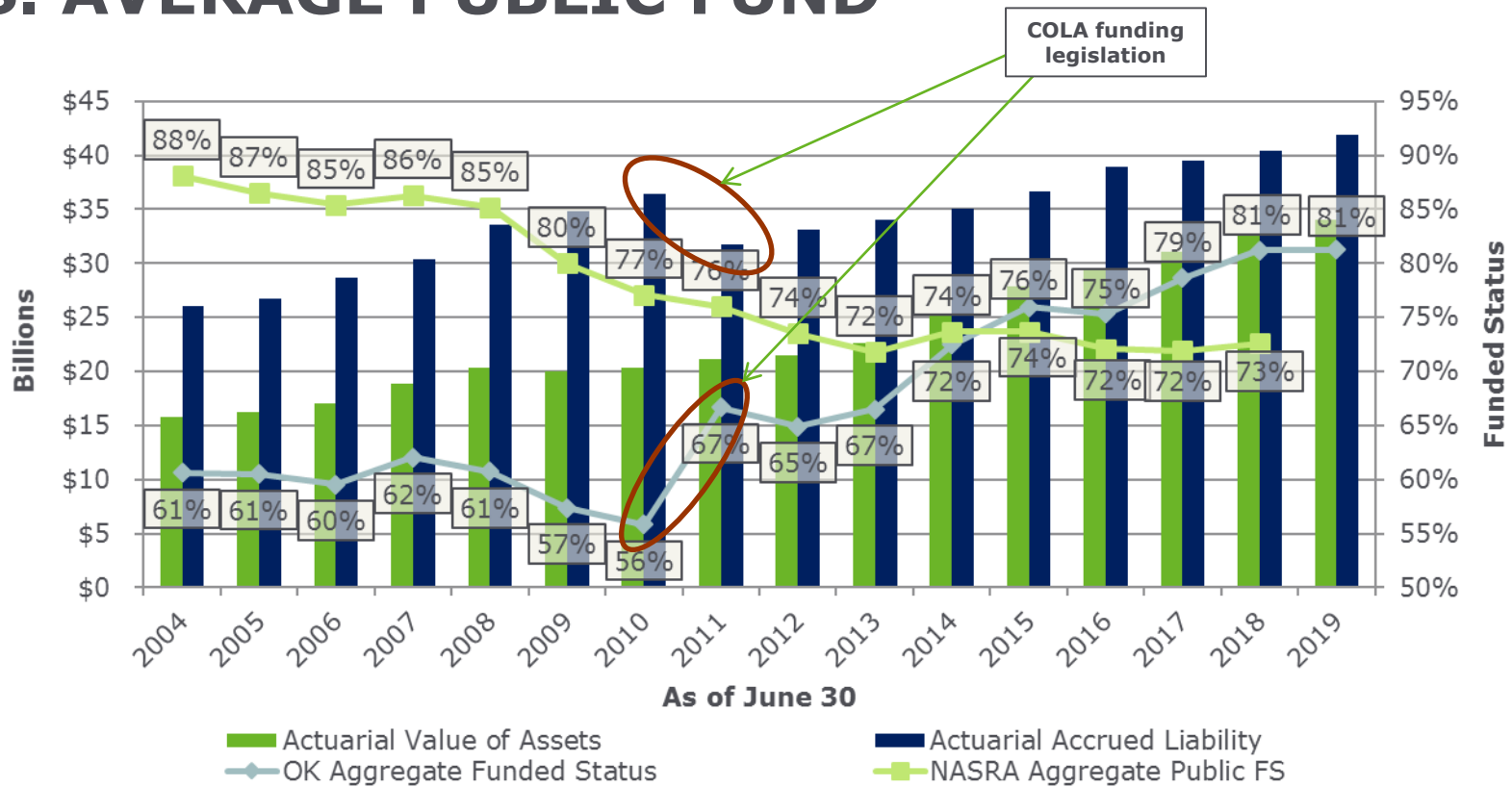
INTRODUCTION

- **NEPC is asked to review the Oklahoma State defined benefit pension plans from an actuarial standpoint on an annual basis**

- **Oklahoma Retirement System is comprised of seven plans:**
    - Teachers' Retirement System of Oklahoma ("Teachers')
    - Oklahoma Public Employees Retirement ("PERS")
    - Oklahoma Firefighters Pension and Retirement System ("Fire")
    - Oklahoma Police Pension and Retirement System ("Police")
    - Oklahoma Law Enforcement Retirement System ("Law")
    - State of Oklahoma Uniform Retirement System for Justices and Judges ("Judges")
    - Retirement Plan for Full-Time Employees of the Department of Wildlife Conservation ("Wildlife")

- **The goals of this presentation are:**
    - To present the funded position of the seven pension plans, on a funding basis and GASB 67 basis
    - To review the comprehensive return performance of both asset and liabilities
    - To review the adequacy of the contributions to the plan
    - To assess the actuarial assumptions and methods for reasonability
    - To note changes in legislation that affected, or may affect, the plans

- **The goals of this review are <u>not</u>:**
    - To audit the liability calculations performed by the plans' actuaries

1. Retirement Horizons, Inc., Cavanaugh Macdonald Consulting, and Gabriel, Roeder, Smith & Company

FUNDED STATUS HISTORY VS. AVERAGE PUBLIC FUND

- **The Oklahoma plans' aggregate funded status has seen continued improvement since 2010 and surpassed the funded status of the average public plan[1] in 2015**
  - House Bill 2132 in 2011 regarding COLA funding had a significant impact on plan funded status
  - Funding policy progress and extended bull market over the last decade

SYSTEM FUNDED POSITION

Plan	Actuarial Value of Assets (in millions)	Actuarial Accrued Liability (in millions)	Unfunded Accrued Liability (in millions)	Funded Status as of 7/1/2019	Funded Status as of 7/1/2018
Teachers	$17,150.3	$23,680.2	$6,529.9	72.4%	72.9%
Public Employees (PERS)	$9,910	$10,047	$138	98.6%	97.7%
Firefighters	$2,756	$3,892	$1,136	70.8%	68.1%
Police	$2,677	$2,612	($65)	102.5%	102.8%
Law Enforcement	$1,052	$1,175	$122	89.6%	90.0%
Judges	$345	$309	($37)	111.9%	114.8%
Wildlife	$117	$129	$12	90.6%	91.4%
Total	**$34,008**	**$41,845**	**$7,836**	**81.3%**	**81.2%**

- **The aggregate funded status of the plans remained relatively flat over fiscal 2019, up from 81.2% to 81.3%**
  - For comparison, the average public pension plan was 72.6% funded in FY 2018[1]

- **Unfunded Liability for the plans is $7.8 billion as of June 30, 2019, up from $7.6 billion from the year prior**
  - Majority of unfunded liability is from the Teachers plan

- **Total plan liabilities grew 3.6% in fiscal 2019, while Actuarial Value of Assets increased by 3.7%**

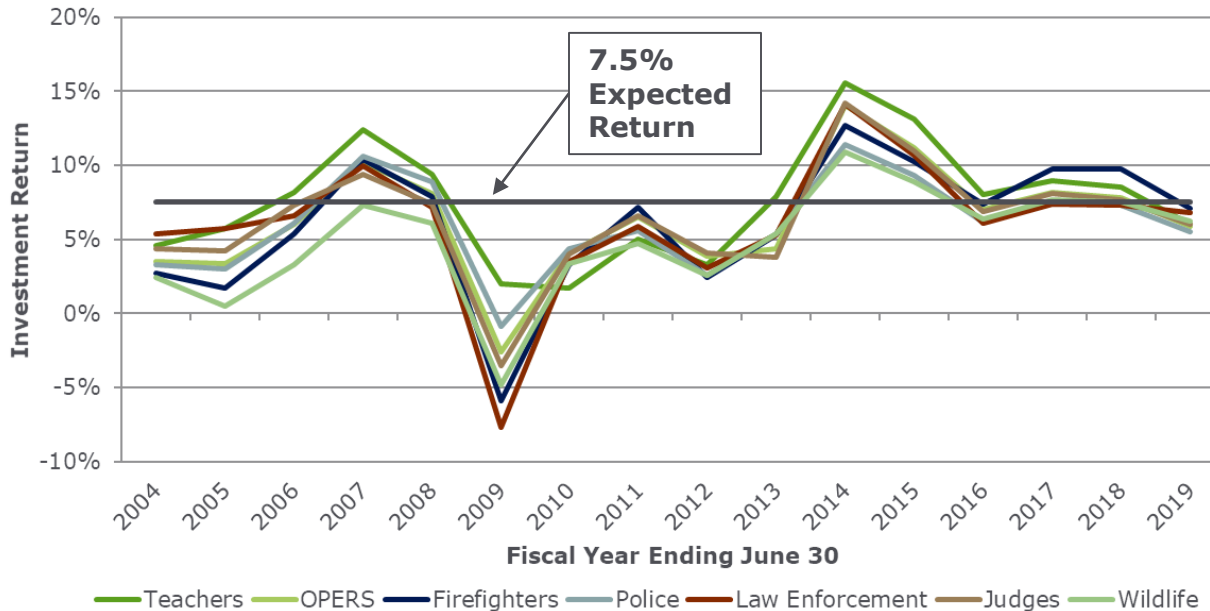# FUNDED STATUS HISTORY – INDIVIDUAL PLAN BASIS
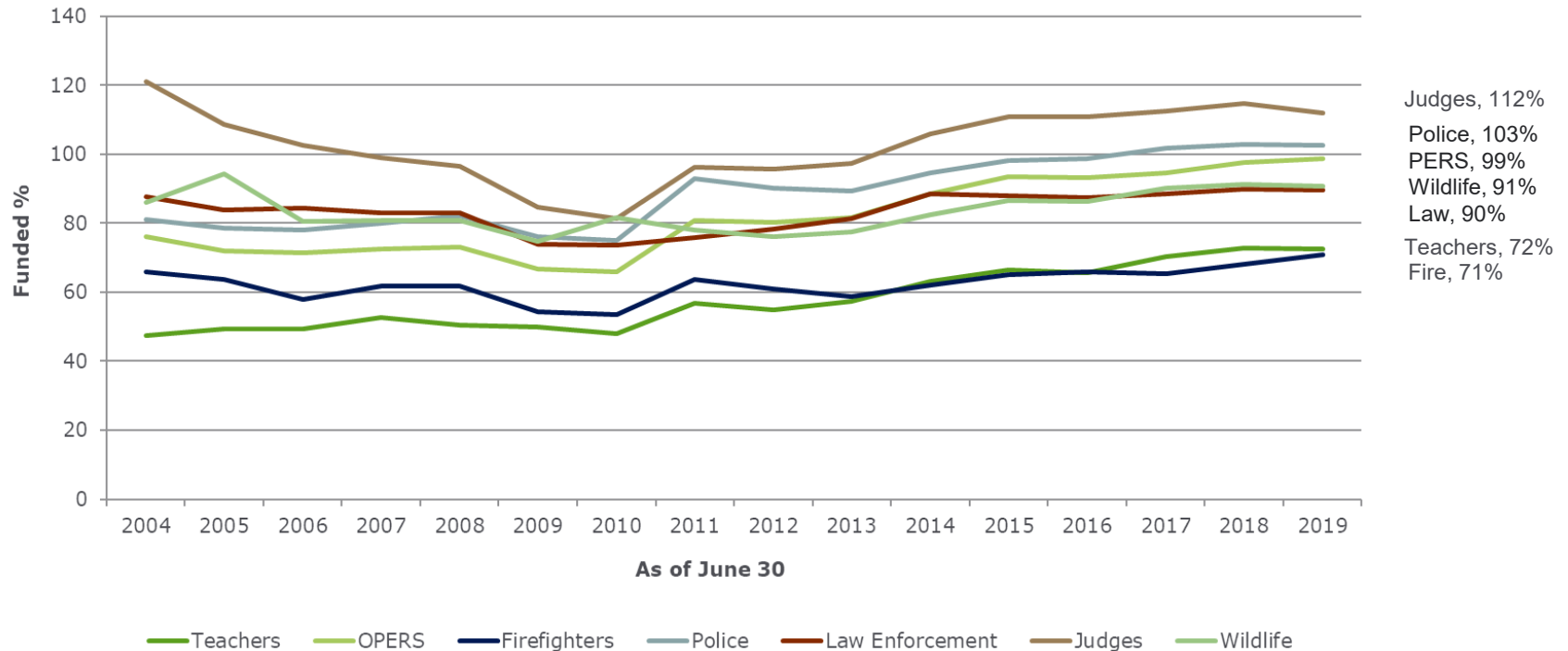
- **All plans have shown improved funded status over the last 15 years**
  - Judges plan still over 100% although slightly lower than in 2004

- **Teachers plan has improved from 51% to 72% funded over this time**

INVESTMENT RETURN HISTORY ACTUARIAL VALUE OF ASSETS

- **Equity markets' continued resilience contributed to a 6.1% weighted average return for the 2019 fiscal year**
  - However, the aggregate return on a Market Value basis was 5.4% due to immediate recognition of prior years' gains and losses

- **The Actuarial Value of Assets smooths gains and losses over 5 years**

	15-year average	10-year average
Teachers	7.7%	7.8%
OPERS	6.6%	7.3%
Firefighters	6.3%	7.5%
Police	6.2%	6.5%
Law Enf	6.1%	7.0%
Judges	6.5%	7.2%
Wildlife	5.1%	6.4%

Sources: 2000 to 2009: Buck Consultants, Milliman Consultants and Actuaries, and Gabriel, Roeder, Smith & Company
2010 to 2016: Buck Consultants, Cavanaugh Macdonald Consulting, and Gabriel, Roeder, Smith & Company
2017: Conduent Consultants, Cavanaugh Macdonald Consulting, and Gabriel, Roeder, Smith & Company
2018: Retirement Horizons, Inc., Cavanaugh Macdonald Consulting, and Gabriel, Roeder, Smith & Company

EXPECTED RETURN – TEACHERS PLAN

	15-year average	10-year average
	8.2%	10.9%
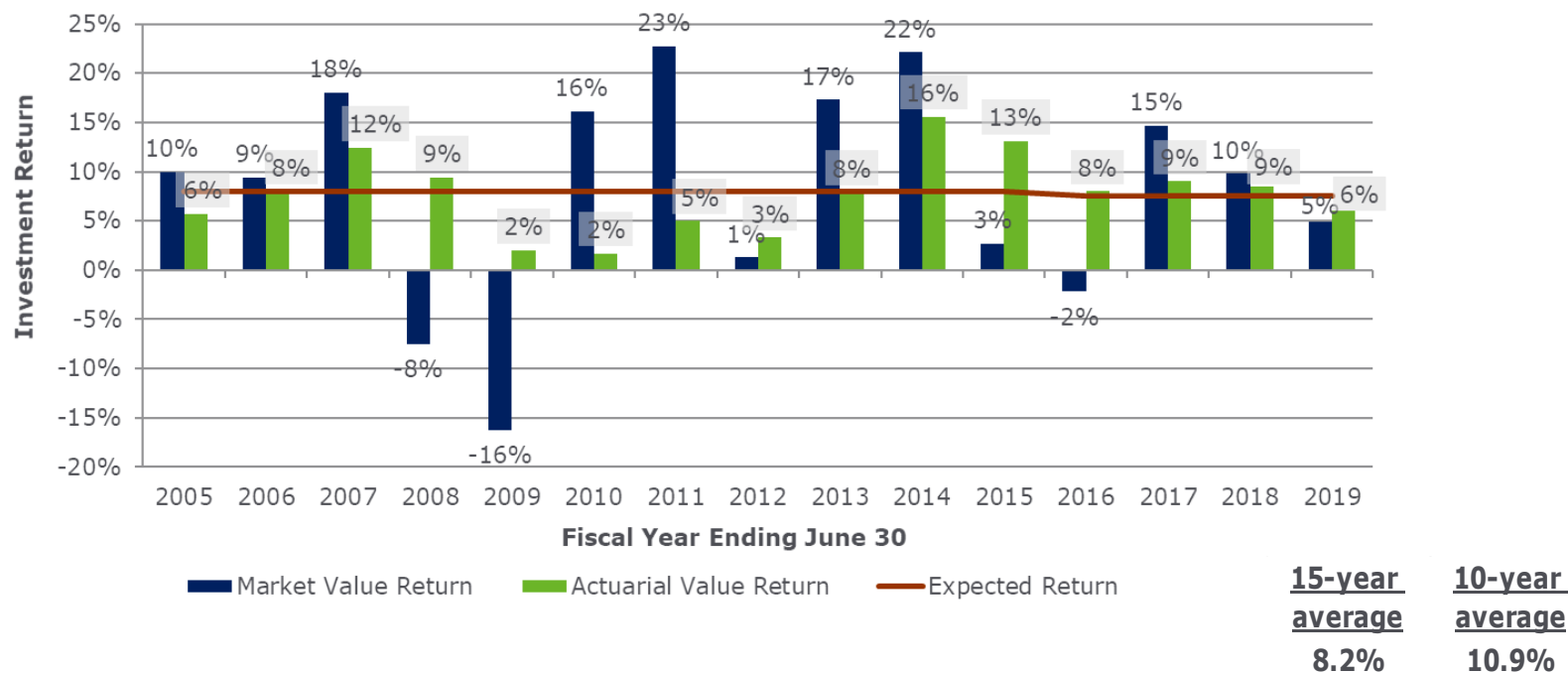
- **The Teachers' plan is shown as an example of the benefit of using actuarial value of assets vs. market value**

- **Actuarial Value return tends to suppress under- and overperformance from a Market Value basis in order to smooth asset values**
  - Measurement date of assets presents a bias
  - Actuarial value aims to remove that bias by smoothing measurements over 5 years

SYSTEM SUMMARY – STATE COSTS AND CONTRIBUTIONS

- **The following table summarizes the *State-only* contribution requirements for the 2019 and 2020 fiscal years**

Pension Plan	FY 2019				FY 2020	
	Actuarially Determined Contribution as % Pay	Actual Contribution as % Pay (estimated)	Actuarially Determined Contribution ($m)	Actual Contribution ($m)	Actuarially Determined Contribution as % Pay	Actuarially Determined Contribution ($m)
Teachers*	7.7%	7.5%	$339	$344	7.8%	$373
OPERS	8.2%	17.8%	$134	$282	7.5%	$122
Firefighters	36.0%	33.5%	$108	$102	32.1%	$99
Police	0.0%	12.8%	$0	$40	0.0%	$0
Law Enforcement	25.8%	30.5%	$22	$24	28.6%	$24
Judges	1.1%	20.9%	$0	$7	2.3%	$1
Wildlife	18.9%	20.7%	$2	$3	20.2%	$2
Total as % of Payroll	**9.0%**	**11.6%**			**9.0%**	
Total Dollars ($m)			**$605**	**$801**		**$621**

* Teachers plan contribution is estimated.

- **For fiscal year ending 2020, the recommended contribution is 9.0% of payroll, or $621 million, a $16m increase from 2019, mostly from the Teachers plan**

- **For fiscal year 2019, the recommended contribution to the Oklahoma pension plans was $605 million, however the actual contribution was $801 million**

- **The contribution amounts for each plan are not tied to the calculation of the actuarially determined contributions amounts (see the following page)**
  - In 2019, six of the seven plans received more than what was actuarially determined
  - The Police plan has no funding recommended contribution for 2019, but will receive the statutory contribution of 14% of insurance premiums taxes

SYSTEM SUMMARY – MANDATED CONTRIBUTION RATES AND FUNDING SOURCES

Mandated Employee and Employer Contribution Rates as of July 1, 2019

Pension Plan	Employee Contribution Rate (% of payroll)	Employer + Federal Contribution rate (% of payroll)	Municipality / Agency Contribution rate (% of payroll)	State Contribution
Teachers	7.0%	Universities: 9.3% Fed Grant matching: 7.7%		5% of tax and lottery revenue = 7.8% payroll
OPERS	3.5%			16.5% of payroll
Firefighters	9.0%		14.0%	36% of insurance premium tax
Police	8.0%		13.0%	14% of insurance premium tax + a % of special tax credit fund
Law Enforcement	8.0%		11.0%	5.0% of insurance premium tax + 1.2% of drivers license tax
Judges	8.0%			22% of payroll
Wildlife	5.0%			

Actual Contributions by Type for Fiscal Year Ending June 30, 2019 (in $millions)

Pension Plan	Employee Contribution	Employer + Federal Contribution	Municipality / Agency Contribution	State Contribution	Total
Teachers	$325.77	$475.01		$343.70	$1,144.48
OPERS	$66.57			$282.47	$349.04
Firefighters	$27.35		$43.38	$101.70	$172.43
Police	$26.17		$42.15	$39.56	
Law Enforcement	$6.69		$10.21	$24.04	$40.94
Judges	$2.67			$7.33	
Wildlife	$0.60			$2.50	$3.10
Total	**$455.81**	**$475.01**	**$95.74**	**$801.31**	**$1,709.99**

ACTUARIALLY DETERMINED CONTRIBUTION RATES

FY 2020	Teachers	OPERS	Firefighters	Police	Law Enforcement	Judges	Wildlife
Total Normal Cost	10.2%	10.2%	21.8%	20.5%	26.3%	24.8%	12.5%
Expenses	0.1%	0.5%	1.3%	0.7%	1.4%	0.6%	0.0%
Amortization of UAAL	13.8%	1.1%	31.9%	-1.6%	20.2%	-15.1%	12.8%
Total ADC	**24.1%**	**11.7%**	**55.0%**	**19.3%**	**47.8%**	**10.3%**	**25.2%**
Employee Contribution	7.0%	4.2%	9.0%	8.0%	8.0%	8.0%	5.0%
Total Employer ADC	**17.1%**	**7.5%**	**46.0%**	**11.3%**	**39.8%**	**2.3%**	**20.2%**
Employer Contribution	9.3%		14.0%	13.0%	11.2%		
Total State ADC	**7.8%**	**7.5%**	**32.0%**	**0.0%**	**28.6%**	**2.3%**	**20.2%**
Statutory Contributions	**7.8%**	**16.5%**	**45.3%**	**25.2%**	**38.6%**	**22.0%**	**ADEC**
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- **The chart above summarized the development of the State and Employer ADC, and shows the Statutory Contribution estimates for FYE 2020**
  - Estimated contributions are shown for plans with a variable funding source, based on the FY 2019 contribution rate

CONTRIBUTION HISTORY – STATE AND MUNICIPALITIES

Actuarially Determined State and Employer Contribution (after reduction for Employee contributions)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Teachers*	$822	$588	$620	$603	$551	$762	$758	$729	$748	$818
OPERS	$402	$240	$257	$259	$201	$165	$182	$174	$134	$122
Firefighters**	$196	$142	$159	$162	$142	$139	$142	$156	$150	$142
Police**	$147	$65	$79	$90	$64	$45	$51	$41	$42	$44
Law Enforcement**	$50	$49	$45	$44	$32	$33	$34	$33	$32	$34
Judges	$13	$7	$7	$7	$5	$3	$4	$2	$0	$1
Wildlife	$3	$4	$4	$4	$4	$3	$3	$2	$2	$2
Total	**$1,633**	**$1,094**	**$1,171**	**$1,169**	**$998**	**$1,150**	**$1,173**	**$1,137**	**$1,109**	**$1,163**

Actual State and Employer Contributions

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Teachers*	$638	$682	$701	$707	$728	$725	$705	$761	$819	TBD
OPERS	$253	$263	$270	$280	$292	$296	$288	$278	$282	TBD
Firefighters**	$92	$101	$111	$116	$130	$132	$128	$142	$145	TBD
Police**	$56	$61	$66	$67	$73	$74	$73	$79	$82	TBD
Law Enforcement**	$25	$26	$28	$30	$32	$33	$32	$34	$34	TBD
Judges	$3	$4	$4	$5	$5	$6	$6	$7	$7	TBD
Wildlife	$3	$4	$4	$4	$4	$4	$5	$3	$3	TBD
Total	**$1,070**	**$1,141**	**$1,184**	**$1,208**	**$1,265**	**$1,269**	**$1,238**	**$1,303**	**$1,372**	TBD

Percent of Actuarially Determined State and Employer Contribution Actually Contributed

FY Ending	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Teachers*	78%	116%	113%	117%	132%	95%	93%	104%	109%	TBD
OPERS	63%	110%	105%	108%	146%	180%	158%	160%	211%	TBD
Firefighters**	47%	71%	70%	71%	91%	94%	91%	91%	97%	TBD
Police**	38%	94%	84%	74%	114%	166%	143%	194%	194%	TBD
Law Enforcement**	50%	53%	63%	68%	101%	100%	94%	103%	107%	TBD
Judges	24%	57%	57%	66%	108%	169%	169%	404%	2066%	TBD
Wildlife	100%	108%	96%	100%	117%	116%	159%	124%	108%	TBD
Total	**66%**	**104%**	**101%**	**103%**	**127%**	**110%**	**106%**	**115%**	**124%**	TBD

* Teachers plan contributions include State, Employer, and Federal funds

** Contributions include State and Agency or Municipality funds

- **Actual contributions exceeded actuarially determined contribution amounts by $263m in fiscal year ending 2019**

SYSTEM FUNDED POSITION UNDER GASB 67

Plan	Fiduciary Net Position (millions)	Total Pension Liability (millions)	Unfunded Accrued Liability (millions)	Funded Status as of 7/1/2019	Discount Rate
Teachers	$16,652	$23,270	$6,618	71.6%	7.5%
Public Employees (PERS)	$9,593	$9,726	$133	98.6%	7.0%
Firefighters	$2,835	$3,892	$1,057	72.9%	7.5%
Police	$2,619	$2,612	($6)	100.2%	7.5%
Law Enforcement	$1,017	$1,162	$145	87.5%	7.5%
Judges	$344	$306	($38)	112.6%	7.0%
Wildlife	$114	$125	$11	91.4%	7.0%
Total	**$33,174**	**$41,094**	**$7,919**	**80.7%**	**7.4%**

- **GASB 67 was introduced in 2012 to improve financial reporting by state and local governmental pension plans**
  - Uses Market Value of Assets instead of Actuarial Value to measure funded status
  - May use a lower, blended discount rate than for funding purposes

- **For fiscal 2019, each plan's actuary has determined that all the plans' projected benefits would be covered by projected assets, therefore discount rates remained unchanged from the funding valuations**

- **Under GASB 67, the overall funded status of the plans were 80.7% vs. 81.3% for funding purposes**

CONTRIBUTION SUMMARY UNDER GASB 67

- **The following table summarizes the State and Employer contribution requirements for the 2019 fiscal years vs. the Actuarially Determined Contribution**

| FY 2019	Actuarially Determined Employer Contribution (ADEC)	Actual Employer Contribution*	Contribution Deficiency	Covered Payroll	ADEC as % of Payroll	Actual Contribution as % of Payroll
Teachers	$760.5	$817.8	($57.3)	$4,473.5	17.0%	18.3%
Public Employees (PERS)	$129.7	$263.7	($134.0)	$1,601.1	8.1%	16.5%
Firefighters	$142.0	$139.4	$2.6	$307.7	46.1%	45.3%
Police	$36.7	$81.7	($45.0)	$324.3	11.3%	25.2%
Law Enforcement	$31.3	$33.0	($1.7)	$85.4	36.6%	38.6%
Judges	$0.4	$7.1	($6.8)	$33.8	1.0%	21.1%
Wildlife	$2.5	$3.1	($0.6)	$12.2	20.4%	25.4%
Total	**$1,103**	**$1,346**	**($243)**	**$6,838**	**18.3%**	**18.5%**

* Includes State and Municipality

- **For fiscal year ending 2019, the Actuarially Determined Contribution is 18.3% of payroll, or $1,103 million**

- **In contrast, in fiscal year 2019, the actual contributions from Employers and the State was 18.5% of payroll, or $1,346 million**

- **As stated earlier, the contribution amounts for each plan are not tied to the calculation of the ADEC amounts**

SYSTEM SUMMARY – CHARACTERISTICS AND ASSUMPTIONS

Investment Return Assumptions

- **Median discount rate for public plans is estimated to be 7.25% in fiscal 2020**

- **Investment return assumptions for Oklahoma plans are in line with other public funds**
  - 7.5% for Teachers, Fire, Police, and Law Enforcement
  - 7.0% for PERS, Judges, and Wildlife
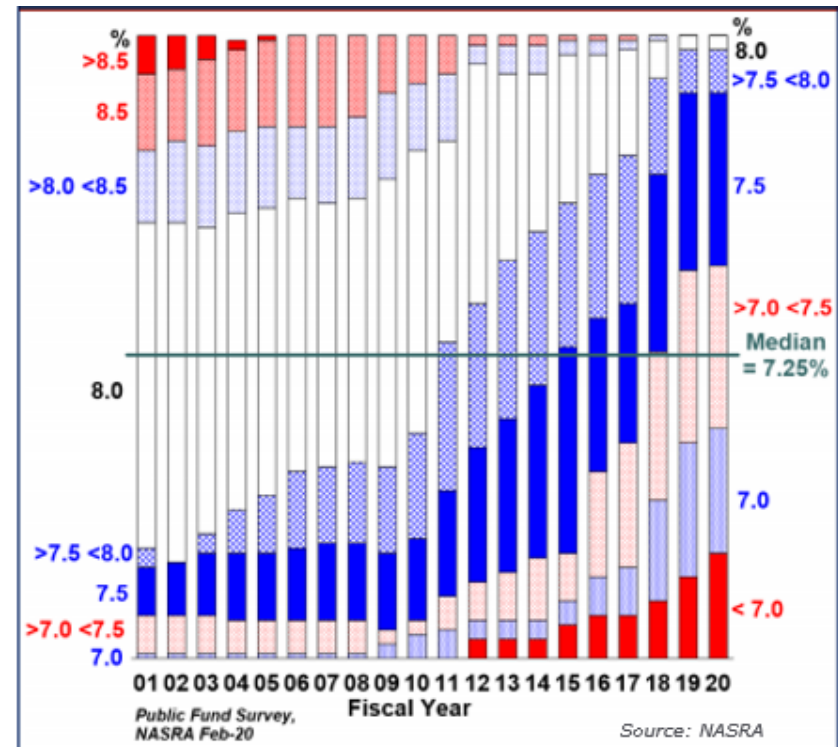
SYSTEM SUMMARY - CHARACTERISTICS AND ASSUMPTIONS

Amortization Assumptions

- **All plans have in place long term amortization schedules to fund the Unfunded Accrued Liability**
  - However some schedules are "open" (re-determined each year) and some "closed" (declining by one year each year)
  - Some plans which had closed amortization schedules are currently amortizing their unfunded liability over shorter timeframes, which result in higher recommended contributions
  - The amortization periods for the Oklahoma pension plans are as follows:
    - 8 years – closed (Judges and OPERS)
      - OPERS plan essentially closed in 2014 due to the opening of a Defined Contribution plan for new hires
    - 10 years – closed (Law Enforcement)
    - 11 years – open (Wildlife) - based on the average future working lifetime for active members
    - 14 years - open (Teachers)
      - The amortization period is set as the funding period for the current actuarial valuation if current funding remains in place, not to exceed 20 years
    - 25 years – closed (Firefighters) – reset in 2014
    - Police – reset in 2018 to 5 years open for Unfunded Liabilities, 30 years open for surpluses

Actuarial Asset Methodology

- **All plans employ similar actuarial asset valuation methods, where gains and losses are smoothed over 5 years**

# SYSTEM SUMMARY - CHARACTERISTICS AND ASSUMPTIONS

Mortality assumptions

- **Mortality assumptions should be chosen to best fit each plan's demographics and historical information**

- **Overall, all of the Oklahoma plans uses actuarially acceptable mortality tables**

- **The Society of Actuaries published new mortality tables in 2019 based on public employee data, called the Pub-2010 tables**
  - Built from data from 78 large public funds
  - Firefighters plan has adopted this table

- **Four of the plans have adopted the RP-2014 mortality tables, which were released in 2014 and had increased longevity assumptions over previous tables**
  - PERS, Law Enforcement, Judges and Justices, and Wildlife plans

- **Teachers and Police plans are using the older RP-2000 mortality tables**
  - However these may be the best fit for the populations of these plans

LEGISLATIVE UPDATES – NATIONWIDE

Figure 1. States that have increased employee contribution rates, 2009-2018
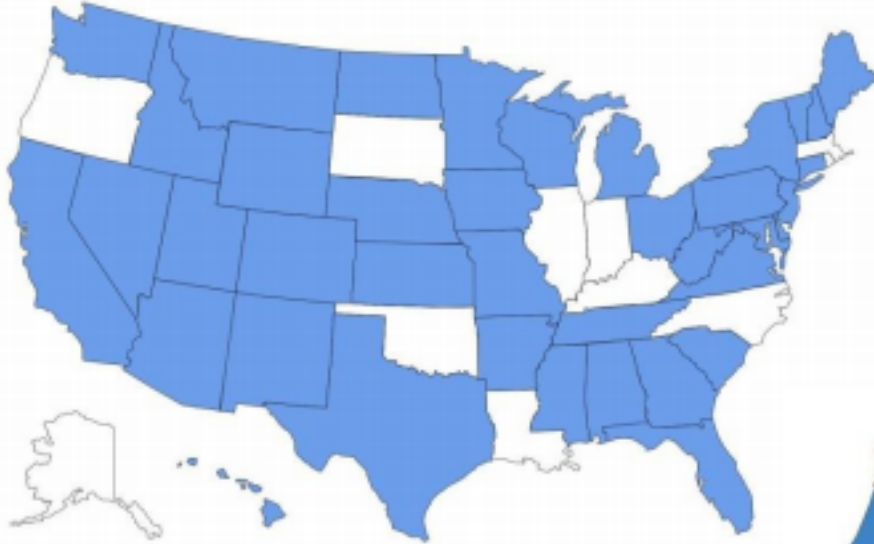
- **Oklahoma is one of only ten states that has not increased employee contribution rates in the last ten years**

Figure 3. State COLA Reductions, 2009-2018

- **Oklahoma is one of many states that made changes to the Cost of Living increases in their plans**

Affecting New Hires Only   Affecting Current Employees & New Hires   Affecting Retirees
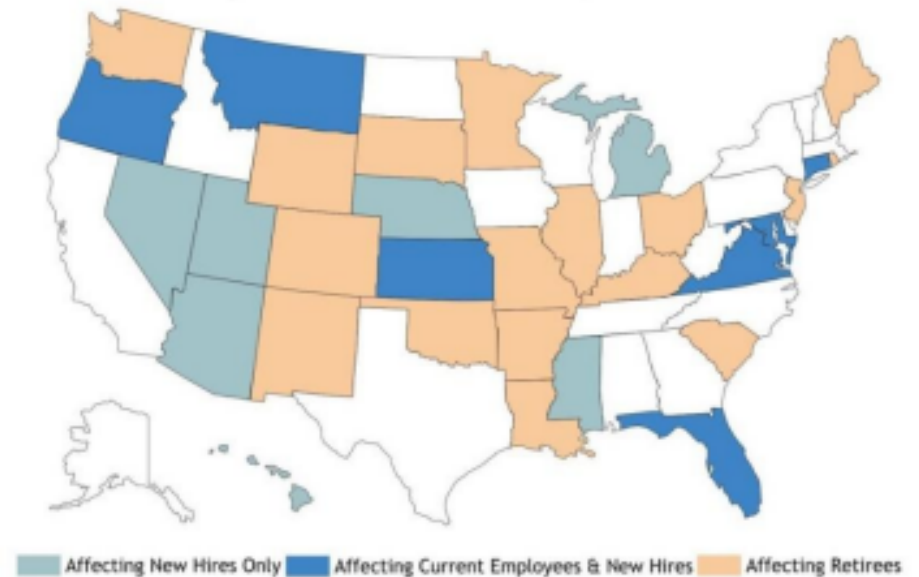
SUMMARY AND CONCLUSIONS

- **In aggregate, the State's plans are 81.3% funded as of June 30, 2019**
  - Four of the seven plans are now over 90% funded, and 2 are over 100%

- **Actual State contributions exceeded recommended amounts by $263m in fiscal 2019**
  - Six of the plans received more than the Actuarially Determined Contribution amount
  - The statutory contribution rates and funding sources are not tied to actuarially determined contribution (ADC) calculations
  - ADC amortization periods differ by plan

- **The plans' assumptions are within a reasonable range**
  - All plans use 7.5% or 7.0% to discount liabilities, where median public fund expected return is 7.25%
  - Four plans have updated their mortality assumptions to the RP-2014 mortality tables and one has updated to the Pub-2010 table

- **GASB 67 reporting found the Oklahoma plans at 80.7% funded, using market value of assets**
  - For fiscal 2019, each plan's actuary had determined that each plans' projected benefits would be covered by projected assets, therefore discount rates remained unchanged from funding valuations