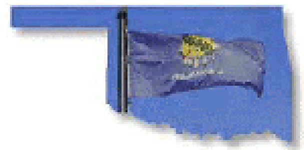

Oklahoma State Pension Commission

Summary of Actuarial Reports

February 24, 2016

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Introduction

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

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

- **Information contained in this report is based on July 1, 2015 Actuarial Valuation reports from plan actuaries[1]**
  - Funded status is based on each plan's funding policy

- **The goals of this presentation are:**
  - To present the funded position of the seven pension plans
  - To review the comprehensive return performance of both asset and liabilities
  - To assess the actuarial assumptions and methods for reasonability
  - To note changes in legislation that affect the plans

1. Buck Consultants, Cavanaugh Macdonald Consulting, and Gabriel, Roeder, Smith & Company

System Summary

- **Funded status of the overall plans has increased since the July 2014 valuations**
  - Aggregate funded status for the plans was **76.0%** as of July 1, 2015, vs. 72.5% as of July 1, 2014
  - Legislative changes in 2011 regarding funding of cost of living adjustments (COLAs) and strong asset returns have driven the improvement in funded status

- **Average asset return on the plans' Market Value was 3.1% for the fiscal year ending June 30, 2015**
  - However, average asset return on the plans' Actuarial Value was **11.9%** for the fiscal year ending June 30, 2015
    - Gains and losses are recognized or "smoothed" over 5 years
    - 2008-09 losses have now been fully recognized
    - 11.9% is higher than the assumed expected return in the plans of 7.0% to 8.0%

- **The Teachers' plan remains the largest and one of the two lesser funded of the seven plans**
  - $20.7 billion in liabilities, $13.8 billion in assets, 66.6% funded
  - If current funding and benefit levels continue, Unfunded Accrued Liability will be funded after 14 years (was 11 years in 2014)
    - Prior to 2011, actuaries projected the period needed to fund Unfunded Accrued Liability as "infinite"
      - This meant if the same contributions and assumptions continued as existed in 2011, the plan would never reach fully funded status

- **Oklahoma PERS created a defined contribution plan for new employees beginning after November 1, 2015 – this plan is not analyzed in this report**

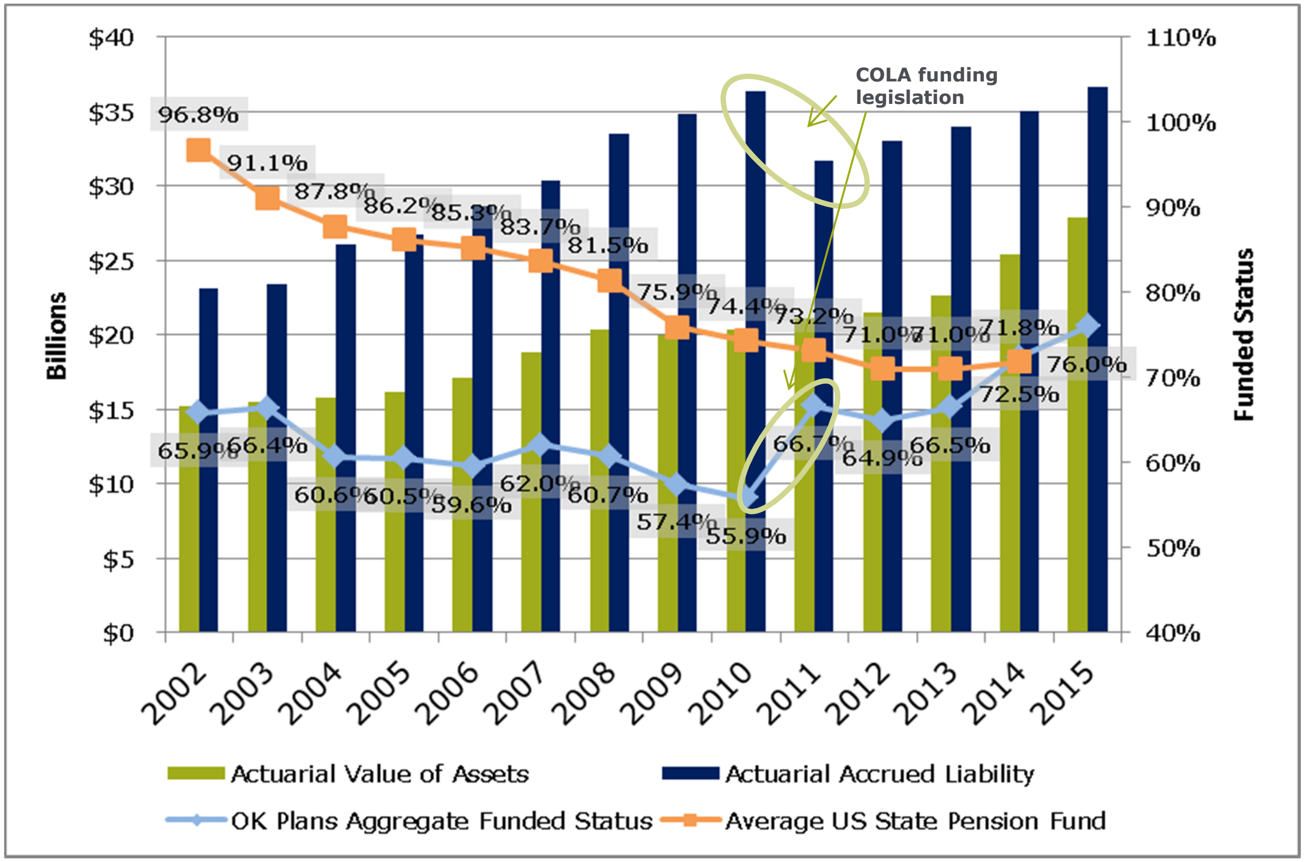
System Summary – Funded Position

Plan	Actuarial Value of Assets (in millions)	Actuarial Accrued Liability (in millions)	Funded Status as of 7/1/2015	Funded Status as of 7/1/2014
Teachers	$13,772	$20,693	**66.6%**	63.2%
Public Employees (PERS)	$8,420	$8,996	**93.6%**	88.6%
Firefighters	$2,176	$3,345	**65.0%**	62.1%
Police	$2,229	$2,269	**98.2%**	94.6%
Law Enforcement	$877	$999	**87.8%**	88.6%
Judges	$295	$266	**110.9%**	105.9%
Wildlife	$98	$113	**86.5%**	82.5%
Total	**$27,867**	**$36,681**	**76.0%**	72.5%

- **Overall funded status of the plans has increased since fiscal 2014**
  - Tepid markets have led to lower than expected asset returns over the past year
    - 3.1% return on Market Value basis
  - However, return on an Actuarial Value basis was 11.9% due to continued recognition of prior years' gains
  - Meanwhile, total plan liabilities grew by 4.7% over the last year
- **Average public pension plan was 71.8% funded in FY 2014[1]**

1. Average public plan results from the 2015 State Pension Update by FitchRatings

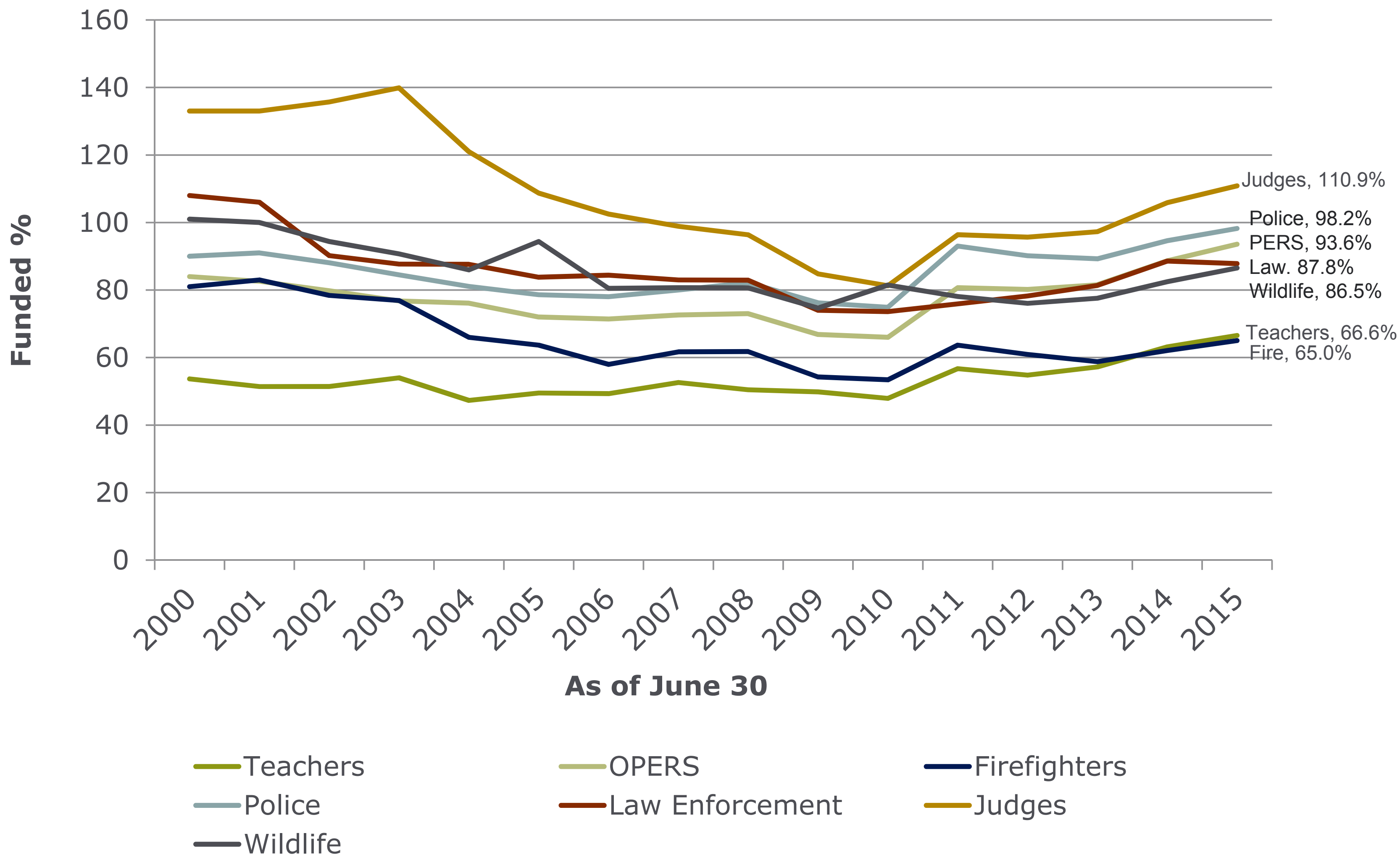
Funded Status History vs. Average Public Fund (Combined Plans)



- **The Oklahoma plans' aggregate funded status had consistently trailed the funded status of the average public plan[1]**
- **However, since 2011, after legislative changes were implemented in Oklahoma regarding COLA funding and since markets have had strong returns, there has been considerable improvement and convergence**

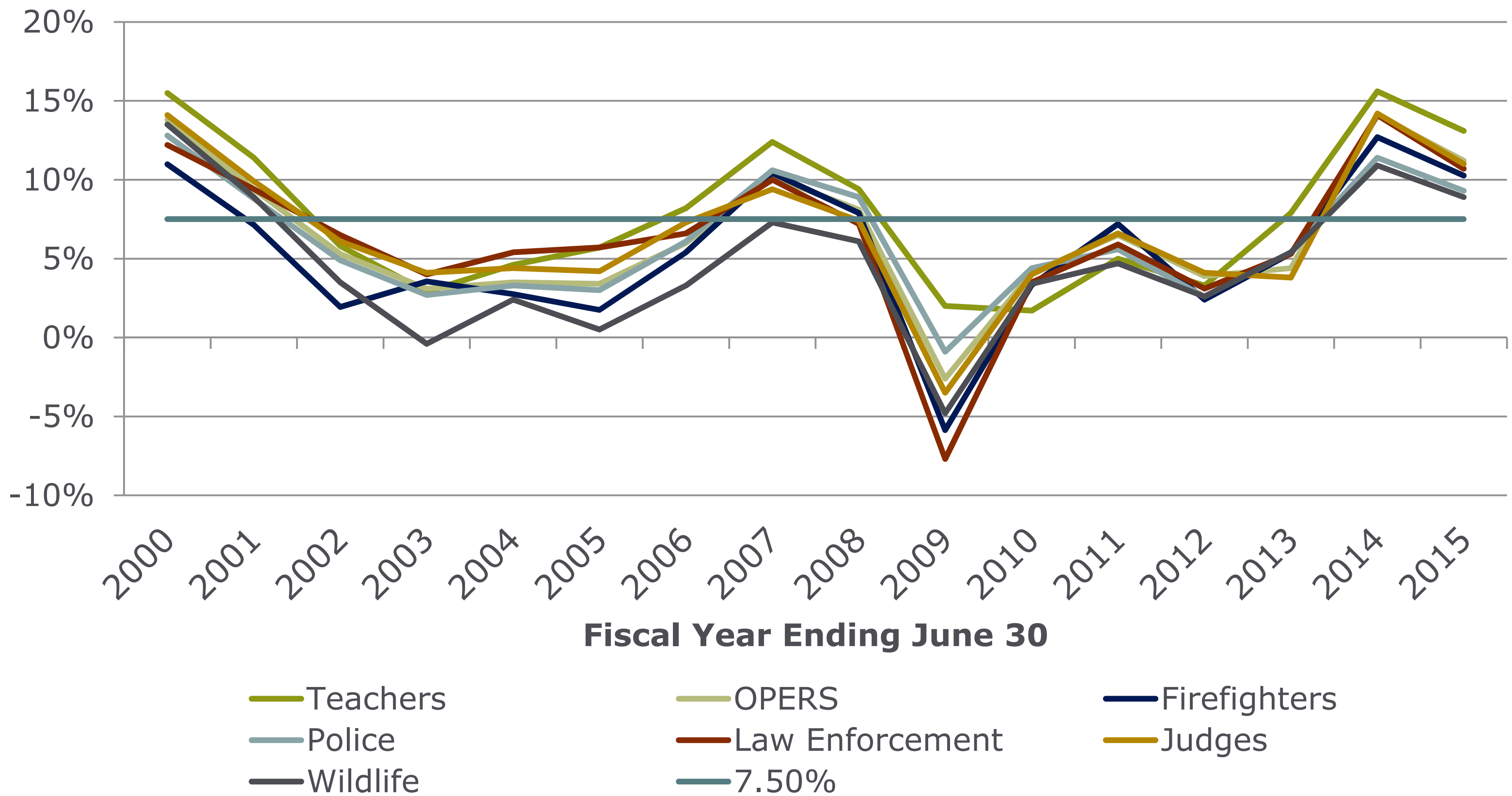
1. 2002-2006 average public plan results from the Public Fund Survey Summary Findings by the National Association of State Retirement Administrators, representing 85% of the state/local government pension community. 2007-2014 average public plan results from the 2015 State Pension Update by FitchRatings

Funded Status History – Individual Plan Basis



Sources: 2000 to 2009: Buck Consultants, Milliman Consultants and Actuaries, and Gabriel, Roeder, Smith & Company
2010 and later: Buck Consultants, Cavanaugh Macdonald Consulting, and Gabriel, Roeder, Smith & Company

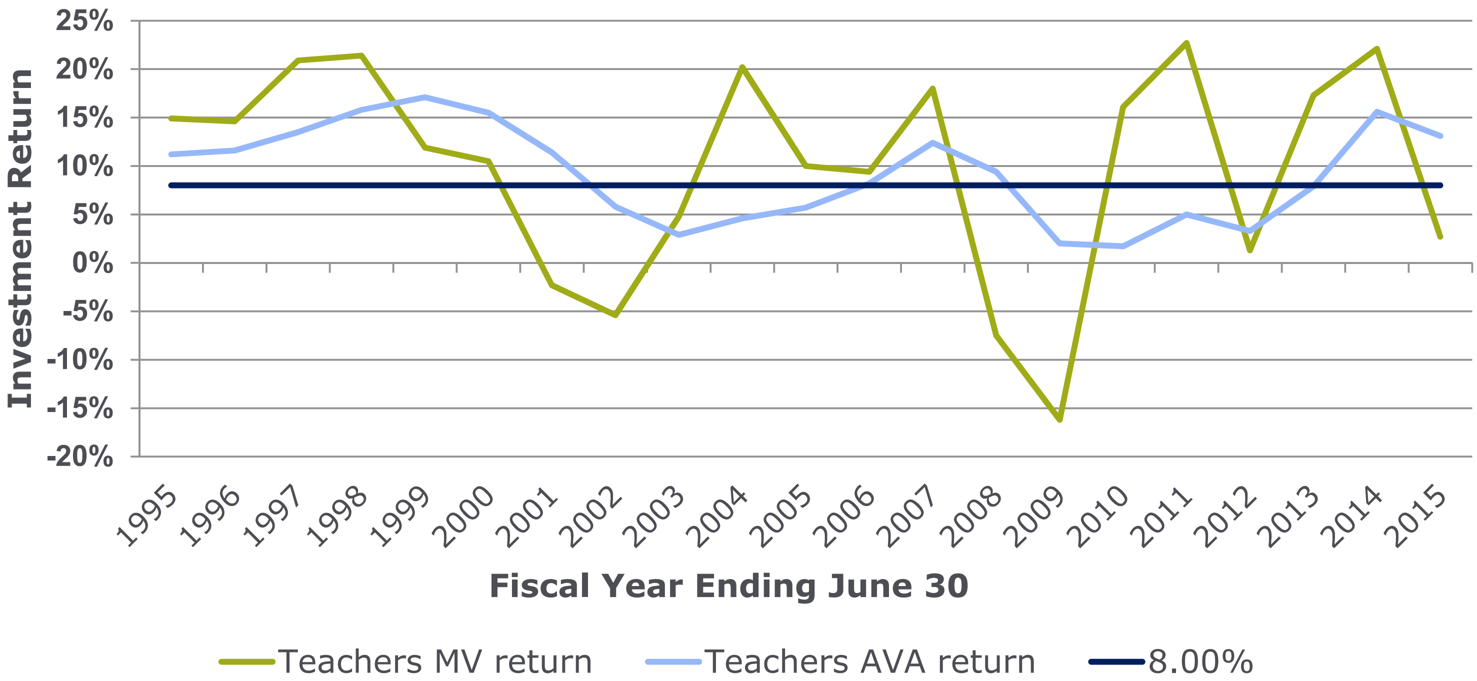
Historical Investment Return on Actuarial Value of Assets



- **Average rate of return for fiscal year ending June 30 2015 was 11.9%**
  - Assumed rate of return was 7.5% for all plans, except for Wildlife plan at 7.0% and Teachers plan at 8.0%
  - Average market value rate of return was 3.1% for the same period

Oklahoma returns sources: 2000 to 2009: Buck Consultants, Milliman Consultants and Actuaries, and Gabriel, Roeder, Smith & Company
2010 and later: Buck Consultants, Cavanaugh Macdonald Consulting, and Gabriel, Roeder, Smith & Company

Investment Return (Teachers' Plan)



- **Actuarial Value tends to lag the Market Value as gains and losses are smoothed in over 5 years**
  - Helps smooth fluctuations in funded status and keep expected return close to assumed rate
- **The Teachers' plan has the highest assumed return of all the Oklahoma plans at 8.0%**

Sources: 1999 and earlier: R.V. Kuhns & Associates. 2000 and later: Gabriel, Roeder, Smith & Company

System Summary – State Costs and Contributions

- **The following table summarizes the State-only contribution requirements for the 2015 and 2016 fiscal years**

	FY 2016		FY 2015			
Pension Plan	**Required Contribution as % Pay**	**Required Contribution ($m)**	**Required Contribution as % Pay**	**Required Contribution ($m)**	**Actual Contribution ($m)**	**Est. Actual Contribution as % Pay**
Teachers*	7.7%	$306	3.8%	$245	$312	7.4%
OPERS	9.1%	$165	11.5%	$201	$292	16.1%
Firefighters	38.2%	$101	39.3%	$104	$91	34.4%
Police	2.2%	$6	9.1%	$26	$36	12.0%
Law Enforcement	26.4%	$22	26.3%	$20	$23	26.9%
Judges	10.0%	$3	14.3%	$5	$5	15.3%
Wildlife	23.4%	$3	27.1%	$4	$4	31.5%
Total as % of Payroll	**9.0%**		**9.0%**			**11.3%**
Total Dollars ($m)		**$607**		**$605**	**$763**	

* Teachers plan is estimated by subtracting expected Employer contributions of 9.3% of payroll from the calculated ARC

- **For fiscal year ending 2015, the recommended contribution to the Oklahoma pension plans was $605 million, or 9.0% of total payroll**
  - $763 million was actually contributed, or 127% of required
- **For fiscal year ending 2016, the recommended contribution remains 9.0% of payroll at $607 million, only $2 million higher than last year**

System Summary – Mandated Contribution Rates and Actual Contributions

- **The chart below shows the rates of contributions, by type, for each plan as mandated by statute**
- **The second table summarizes actual contributions, by type, for each plan in fiscal 2015**

Mandated Employee and Employer Contribution Rates as of July 1, 2015

Pension Plan	Employee Contribution Rate (% of payroll)	Employer + Federal Contribution rate (% of payroll)	Municipality / Agency Contribution rate (% of payroll)	State Contribution rate
Teachers	7.0%	EESIP: 9.5% Non-EESIP: 8.55% Federal grants: 8.25%*		5% of tax and lottery revenue
OPERS	3.5%			16.5% of payroll
Firefighters	9.0%		14.00%	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%			17.5% of payroll
Wildlife	5.0%			

Actual Contributions by Type for Fiscal Year Ending June 30, 2015 (in $millions)

Pension Plan	Employee Contribution	Employer + Federal Contribution	Municipality / Agency Contribution	State Contribution	Total
Teachers	$304	$416		$312	**$1,032**
OPERS	$73			$292	**$365**
Firefighters	$24		$39	$91	**$154**
Police	$23		$37	$36	**$96**
Law Enforcement	$6		$9	$23	**$39**
Judges	$3			$5	**$8**
Wildlife	$1			$4	**$5**
Total	**$434**	**$416**	**$85**	**$763**	**$1,699**

Contribution History – State and Municipalities

Required **State and Employer Contribution - after reduction for estimated Employee contributions**

	7/1/05	7/1/06	7/1/07	7/1/08	7/1/09	7/1/10	7/1/11	7/1/12	7/1/13	7/1/14	7/1/15
Teachers*	$535	$576	$591	$714	$742	$822	$588	$620	$603	$551	$762
OPERS	$310	$339	$364	$323	$389	$402	$240	$257	$259	$201	$165
Firefighters**	$118	$147	$147	$158	$187	$196	$142	$159	$162	$142	$139
Police**	$85	$95	$101	$103	$132	$147	$65	$79	$90	$64	$45
Law Enforcement**	$30	$33	$33	$37	$48	$50	$49	$45	$44	$29	$32
Judges	$4	$6	$8	$8	$11	$13	$7	$7	$7	$5	$3
Wildlife	$3	$3	$3	$3	$4	$3	$4	$4	$4	$4	$3
Total	**$1,086**	**$1,197**	**$1,246**	**$1,374**	**$1,514**	**$1,633**	**$1,094**	**$1,171**	**$1,169**	**$995**	**$1,149**

Actual **State and Employer Contributions**

	7/1/05	7/1/06	7/1/07	7/1/08	7/1/09	7/1/10	7/1/11	7/1/12	7/1/13	7/1/14	7/1/15
Teachers*	$460	$536	$597	$619	$621	$638	$682	$701	$707	$728	TBD
OPERS	$171	$198	$220	$243	$260	$253	$263	$270	$280	$292	TBD
Firefighters**	$82	$118	$83	$83	$82	$92	$101	$111	$116	$130	TBD
Police**	$50	$56	$56	$59	$55	$56	$61	$66	$67	$73	TBD
Law Enforcement**	$22	$24	$25	$25	$23	$25	$26	$28	$30	$32	TBD
Judges	$1	$1	$2	$2	$9	$3	$4	$4	$5	$5	TBD
Wildlife	$3	$3	$3	$3	$4	$3	$4	$4	$4	$4	TBD
Total	**$788**	**$936**	**$986**	**$1,034**	**$1,054**	**$1,070**	**$1,141**	**$1,184**	**$1,208**	**$1,265**	**TBD**

Percent of Required State and Employer Contribution Actually Contributed

	7/1/05	7/1/06	7/1/07	7/1/08	7/1/09	7/1/10	7/1/11	7/1/12	7/1/13	7/1/14	7/1/15
Teachers*	86%	93%	101%	87%	84%	78%	116%	113%	117%	132%	TBD
OPERS	55%	58%	61%	75%	67%	63%	110%	105%	108%	146%	TBD
Firefighters**	70%	80%	56%	53%	44%	47%	71%	70%	71%	91%	TBD
Police**	59%	59%	56%	57%	41%	38%	94%	84%	74%	114%	TBD
Law Enforcement**	73%	75%	77%	68%	48%	50%	53%	63%	68%	112%	TBD
Judges	18%	20%	22%	27%	81%	24%	57%	57%	66%	108%	TBD
Wildlife	96%	104%	97%	100%	100%	100%	108%	96%	100%	117%	TBD
Total	**73%**	**78%**	**79%**	**75%**	**70%**	**66%**	**104%**	**101%**	**103%**	**127%**	**TBD**

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

** Contributions include State and Agency or Municipality funds

System Summary – 2015 Legislative Changes

- **There were no new legislative changes affecting the pension plans enacted in fiscal year ending June 30, 2015**

- **Oklahoma PERS created a defined contribution plan for most new employees beginning November 1, 2015**
  - The effect on the defined benefit plan liabilities will not be seen immediately as all prior benefits remain in the plan
  - Eventually, plan population will begin to decline, lowering plan costs
  - This defined contribution plan is not covered in the analysis in this report

System Summary - Characteristics and Assumptions

- **Investment return assumptions (8.0% for Teachers, 7.0% for Wildlife, 7.5% for all other plans) are in line with other public funds; but the Teachers' plan at 8.0% may face pressure to be lowered**
  - Median discount rate for public plans was 7.75%, average 7.68%, in 2013[1]

- **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:
    - 5 years – open (Police)
    - 12 years – closed (Judges and OPERS)
    - 14 years – closed (Law Enforcement)
    - 29 years – closed (Firefighters)
    - 30 years - open (Teachers) for fiscal 2015. For fiscal 2016, 14 years – open.
      - In September 2015, the Board adopted an approach to determine the amortization period as the funding period for the current actuarial valuation (i.e., 14 years as of June 30, 2015), not in excess of 20 years)

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

- **All the plans' mortality assumptions use the RP-2000 tables. Actuaries will recommend if newer mortality assumptions are suitable for the plans' demographics**
  - RP-2014 mortality tables were published in 2014 by the Society of Actuaries, reflecting improved longevity of plan participants
  - These tables were developed for corporate plans and have not yet been mandated by the IRS for funding valuations, however many corporate plan accountants have pushed for earlier adoption
  - Adopting these tables could increase plan liabilities by 2-10%, depending on plan demographics

1. Results from the Public Fund Survey Summary Findings for FY 2013, published December 2014 by the National Association of State Retirement Administrators

System Summary – GASB 67 Funded Position for Fiscal 2014

Plan	Market Value of Assets (in millions)	Total Pension Liability (in millions)	GASB 67 Funded Status as of 7/1/2014	Discount Rate
Teachers	$14,229	$19,647	**72.4%**	8.0%
Public Employees (PERS)	$8,570	$8,754	**97.9%**	7.5%
Firefighters	$2,197	$3,225	**68.1%**	7.5%
Police	$2,238	$2,205	**101.5%**	7.5%
Law Enforcement	$880	$916	**96.0%**	7.5%
Judges	$301	$259	**116.5%**	7.5%
Wildlife	$96	$109	**88.3%**	7.0%
Total	**$28,513**	**$35,115**	**81.2%**	7.78%

- **GASB 67 was first implemented for the fiscal year ending June 30, 2014**
  - Uses Market Value of Assets instead of Actuarial (smoothed) Value of Assets
  - May use a different discount rate than expected return if projected assets are deemed not sufficient to pay projected benefits
- **Fiscal 2015 GASB 67 reports were not finalized for all of the plans at the time of this presentation, and therefore will be summarized once all of the reports become available**
- **As of July 1, 2014, overall funded status of the plans were 81.2% under GASB 67, vs. 72.5% using Actuarial value of assets**
- **For fiscal 2014, each plan's actuary had determined that all the plans' projected benefits would be covered by projected assets, therefore discount rates remained unchanged from funding valuation**

Summary and Conclusions

- **In aggregate, the State's plans are 76.0% funded as of June 30, 2015**
  - Funded status increased across all plans but the Law Enforcement plan
  - Five out of the seven plans are over 85% funded
  - Firefighters' plan is the least funded at 65.0%

- **Recent strong asset performance continues to flow through the actuarial value of assets and helped boost funded status**
  - 2008/09 losses have been fully recognized and now more past years' gains are being recognized in the Actuarial Value of Assets
  - Actual contributions exceeded recommended amounts by $158m

- **The plans' assumptions are within a reasonable range**
  - However, investment return expectations continue to be muted, thus putting pressure on the long-term ROA assumptions for the Teachers' plan which remains at 8.0%
    - Average US State pension plan return assumption was 7.68%[1]

- **GASB 67 reporting was required for fiscal 2014, and GASB 68 reporting is required for fiscal 2015**
  - Not all plans' 2015 GASB 67 reports were finalized at the time of this presentation, and will be summarized when the reports become available
  - For fiscal 2014, each plan's actuary had determined that each plans' projected benefits would be covered by projected assets, therefore discount rates remained unchanged from funding valuation

1. Results from the Public Fund Survey Summary Findings for FY 2013, published December 2014 by the National Association of State Retirement Administrators