

▶ TENNESSEE CONSOLIDATED RETIREMENT SYSTEM

Actuarial Funding Valuation – Legacy Pension Plans
Valuation Date: June 30, 2017

November 30, 2017

Justin C. Thacker, F.S.A.

Bryan, Pendleton, Swats & McAllister, LLC



► Valuation Purpose

- Determine contribution rates
(TCA Section 8-37 Part 3)
- Examine financial health of plan
- Separate process and reporting for GASB 67/68

► Valuation Background

- Experience Study
 - Mandated by statute
 - Most recent study reviewed 2012 - 2016 period
 - New assumptions adopted (applied to 6/30/2017 valuation)
 - Performed every 4 years
 - Next study will review 2016 – 2020 period
- Actuarial Audit
 - Commonly done for public plans
 - Last audit performed in 2010
 - Endorsed methodology and results
 - Performed every 10 years

▶ System Overview – Legacy Plans (as of June 30, 2017)

- Defined Benefit System
 - State employees, higher education and K-12 teachers hired prior to July 1, 2014
 - 575+ local governments (participation is optional and costs are valued individually)
- Demographic Data
 - 186,000 Active Participants
 - 154,000 Retired Participants
((\$2.5 Billion in annual payments))
- Market Value of Assets -- \$46.8 Billion
- Funding Basis is Traditionally Conservative

► System Overview – Plan Design

	<u>Legacy Plan</u>	<u>Hybrid Plan*</u>
Benefit Multiplier	1.575%	1.0%
Full Retirement	Age 60/30 YOS	Age 65/Rule of 90
Early Retirement	Age 55/25 YOS	Age 60/Rule of 80
Employee Contributions	State-0%;TCH-5%	State-5%;TCH-5%
Cost of Living Adjustment	CPI (Max 3%)	CPI (Max 3%)
Defined Contribution Component	None	5% From Employer
Stabilization Reserve	None	Yes
Cost Controls	None	9% Employer Target
Unfunded Liability Controls	None	Limit: 12.5% of State Indebtedness

*New Hybrid Plan effective only for new hires after 7/1/2014

▶ System Overview – Plan Design

- Hybrid plan began 7/1/2014 with new employees only
- All employees hired prior to 7/1/2014 continue in legacy plan
- Cost savings of new hybrid plan will be gradual over time
- Legacy plan must still be managed and funded adequately
- Remainder of presentation related to legacy plans

Active Membership Comparison by Number (Legacy Plans)

<u>Group</u>	<u>2016</u>	<u>2017</u>	<u>Pct Change</u>
Teachers	65,458	62,320	(4.8)%
State	46,819	43,080	(8.0)
Political Sub	78,007	79,819	2.3
Others	836	792	(5.3)
Total	<u>191,120</u>	<u>186,011</u>	<u>(2.7)%</u>

Active Membership Comparison by Compensation (Legacy Plans)

Group	2016	2017	Pct Change
Teachers	\$3,465,945,978	\$3,414,741,059	(1.5)%
Average	52,949	54,794	3.5
State	2,190,919,232	2,152,083,926	(1.8)
Average	46,796	49,956	6.8
Political Sub	2,588,995,836	2,741,394,464	5.9
Average	33,189	34,345	3.5
Others	88,441,980	87,389,035	(1.2)
Average	105,792	110,340	4.3
Total	\$8,334,303,026	\$8,395,608,484	0.7%
Average	\$43,608	\$45,135	3.5%

Retired Member Comparison by Number (Legacy Plans)

<u>Group</u>	<u>2016</u>	<u>2017</u>	<u>Pct Change</u>
Teachers	49,336	50,230	1.8%
State	51,717	53,177	2.8
Political Sub	44,720	46,621	4.3
Others	3,572	3,477	(2.7)
Total	<u>149,345</u>	<u>153,505</u>	<u>2.8%</u>

Retired Member Comparison by Benefit Amount (Legacy Plans)

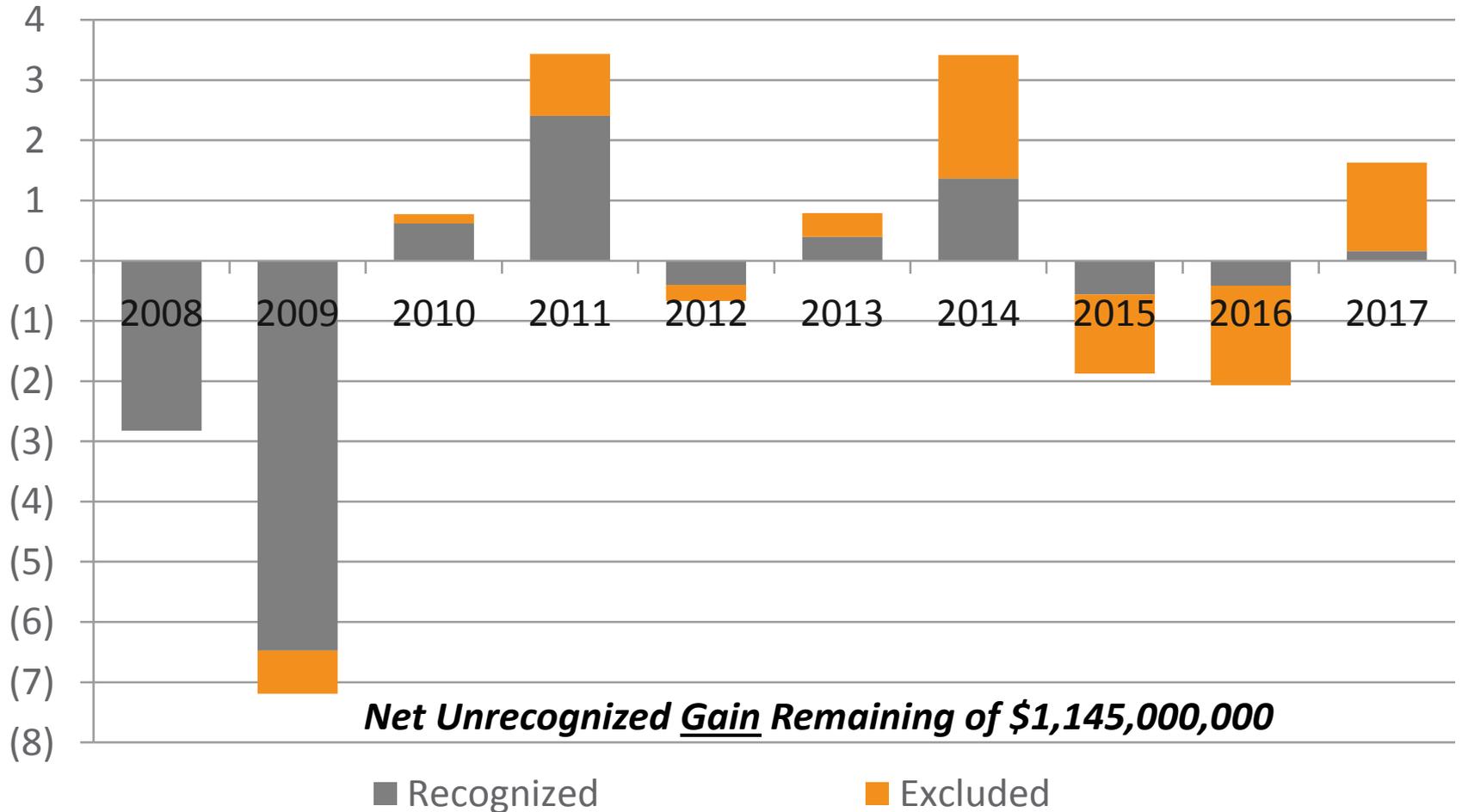
Group	2016	2017	Pct Change
Teachers	\$1,142,551,737	\$1,187,624,014	3.9%
Average	23,159	23,644	2.1
State	770,471,036	812,320,001	5.4
Average	14,898	15,276	2.5
Political Sub	350,552,906	376,190,301	7.3
Average	7,839	8,069	2.9
Others	97,089,598	97,619,260	0.5
Average	27,181	28,076	3.3
Total	\$2,360,665,277	\$2,473,753,576	4.8%
Average	\$15,807	\$16,115	1.9%

► Valuation Asset Method

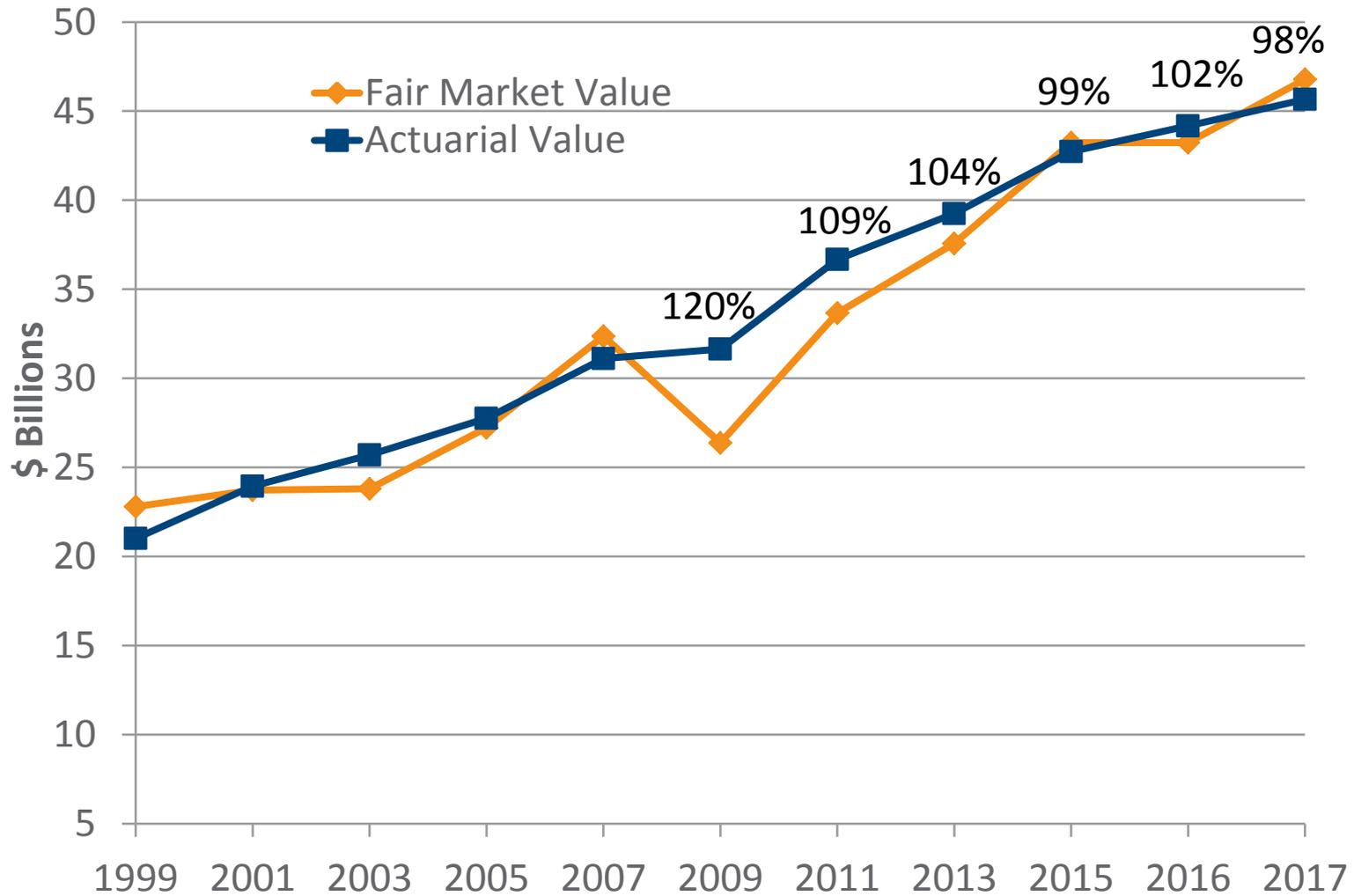
- Use “smoothing” device to limit contribution volatility
- Phase-in excess or deficit earnings compared to the earnings assumption ratably over ten-year period
- Utilize 80%/120% corridor
- Resulting value is “Actuarial Value of Assets”
- Actuarial Value of Assets is only used to determine contribution rates pursuant to the TCRS funding policy (Market Value of Assets used for GASB reporting)

Valuation Asset Gains and Losses (Legacy Plans)

\$ Millions



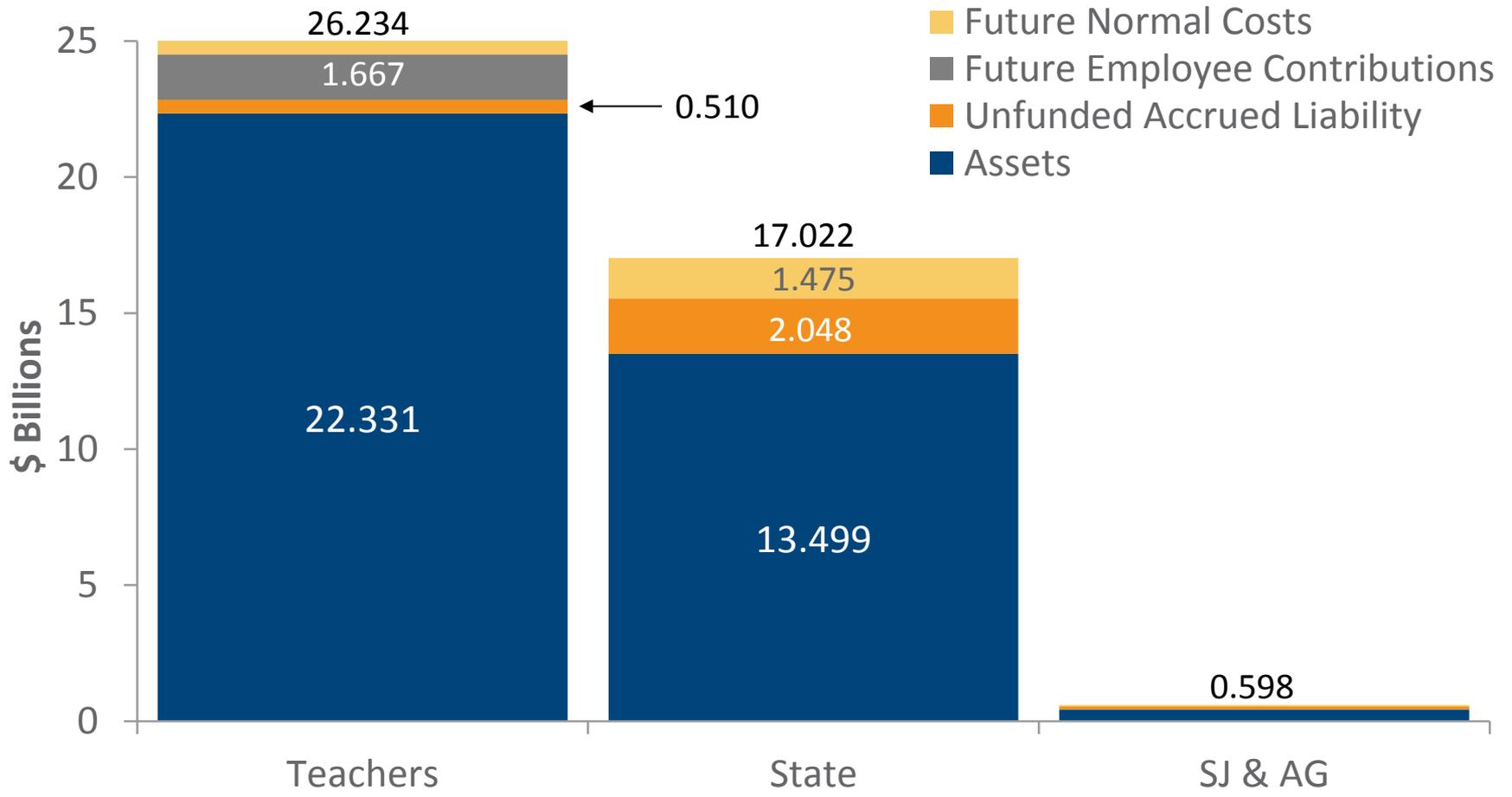
Valuation Asset Comparison to Market (Legacy Plans)



► Contribution Rate Determination

- Entry Age Normal funding method
- Normal Cost + Amortization of Unfunded Accrued Liability (UAL) + Administrative Fee
- Level dollar amortization of Unfunded Accrued Liability
- Amortization periods adjusted each year to manage rate changes and are within requirements of state law and pursuant to TCRS funding policy
- Local governments will be allowed to amortize the UAL pursuant to the TCRS funding policy

Present Value of Benefits – Legacy Plans (June 30, 2017)



Unfunded Accrued Liability – Legacy Plans (Actuarial Value of Assets)

	2016	2017	2017 Funded Ratio
Consolidated State	\$1,460,084,000	\$2,048,292,000	86.8%
State Judges and Attorneys General	90,434,000	107,971,000	80.1%
Total State	\$1,550,518,000	\$2,156,263,000	86.6%
Contributory Teachers	134,716,000	510,205,000	97.8%
Total	\$1,685,234,000	\$2,666,468,000	93.2%

The results for the Political Subdivisions are in progress and will be provided at a later date.

► Amortization of Unfunded Accrued Liability (UAL)

- New layer of UAL created with each valuation
- Effective Amortization Period for total UAL (in years)

	<u>2016</u>	<u>2017</u>
Teachers	1.13	3.38
State	8.46	13.64
Judges & AG	12.85	12.88

- Amortization periods are lower than many other states
- Full detail of amortization schedule by layer on following page

Amortization of Unfunded Accrued Liability (UAL) (Detailed Schedule of Periods)

- **2017 amortization periods for UAL**

- UAL Layer 1 - 2013 valuation
(Teachers – 2.72 years; State – 10.70 years; Judges & AG – 12.00 years)
- UAL Layer 2 - 2015 valuation
(Teachers – 18.00 years; State – 18.00 years; Judges & AG – 18.00 years)
- UAL Layer 3 - 2016 valuation
(Teachers – 19.00 years; State – 19.00 years; Judges & AG – 19.00 years)
- UAL Layer 4 - 2017 valuation
(Teachers – 20.00 years; State – 20.00 years; Judges & AG – 20.00 years)

▶ Contribution Rate Summary (Legacy Plans)

	2016	2017
Contributory Teachers	9.08%	10.46%
Consolidated State*	19.00%	19.36%
State Judges and Attorneys General	23.33%	25.55%

*The Consolidated State contribution rate includes the costs attributable to bridge and service retirement benefits for public safety officers. In practice, a separate contribution rate is determined for General Employees and Public Safety Officers.

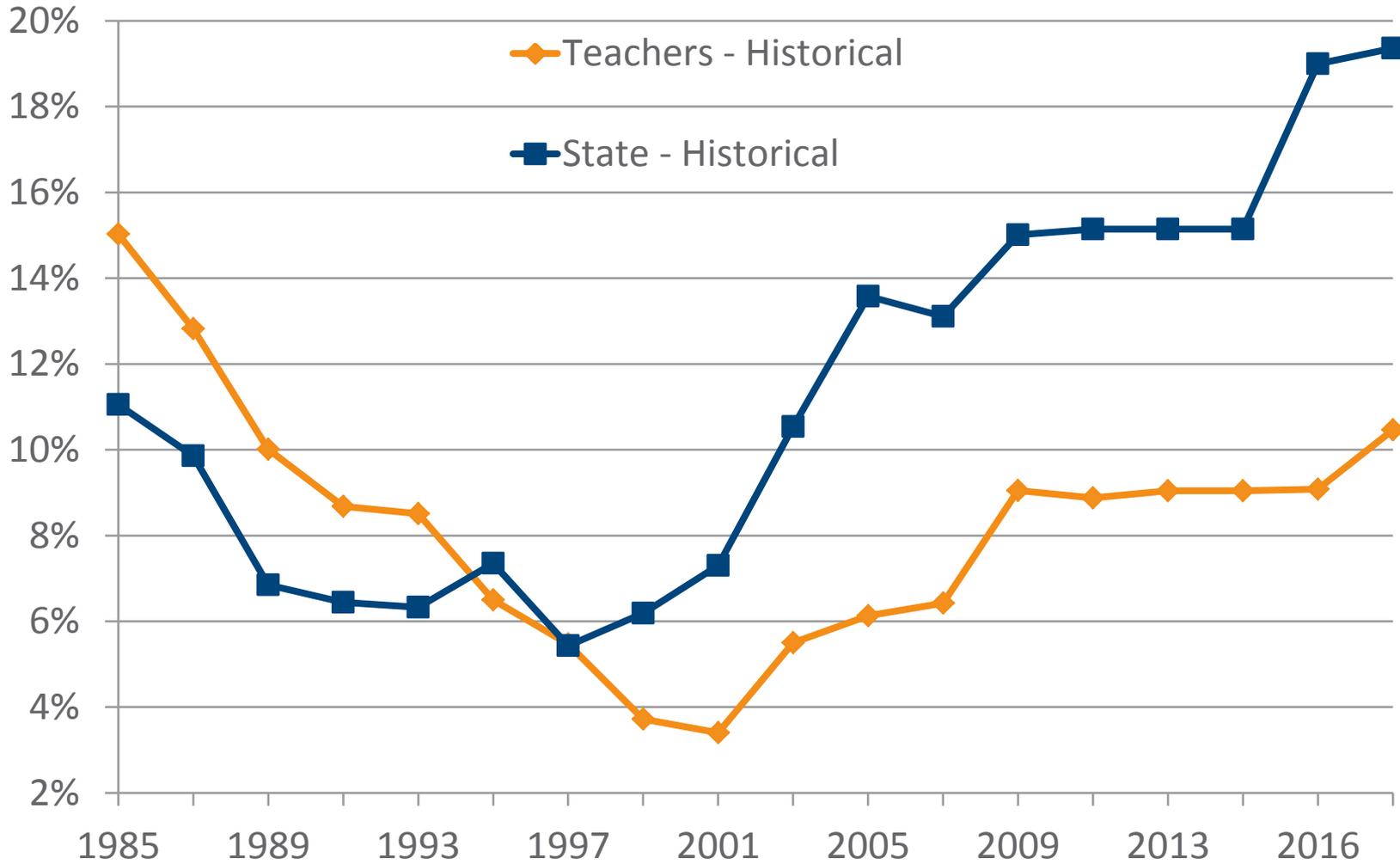
Contribution Reconciliation (Legacy Plans)

	Teachers	State
2016 Contribution rate	9.08%	19.00%
Asset Experience	0.73	0.68
Salary Experience	(0.12)	0.07
Cost of Living Escalation	(0.14)	(0.16)
Prior Service Purchases (estimate)	0.10	0.10
Turnover Impact on Total Payroll	0.04	0.44
Other Experience and Census Changes	(0.17)	0.34
Changes in Assumptions (see next slide)	0.94	1.79
Re-amortization of UAL	0.00	(2.90)
	10.46%	19.36%
2017 Contribution rate		

Detail of Changes in Assumptions (Legacy Plans)

	<u>Teachers</u>	<u>State</u>
Discount Rate	2.47%	2.24%
Cost of Living Adjustments (COLA)	(1.65)	(1.56)
Compensation Increases	(0.68)	(0.51)
Pre-Retirement Mortality	0.03	0.04
Post-Retirement Mortality	0.77	1.58
Total Changes in Assumptions (effect on 2017 Contribution rate)	0.94%	1.79%

Contribution Rate History (Legacy Plans)

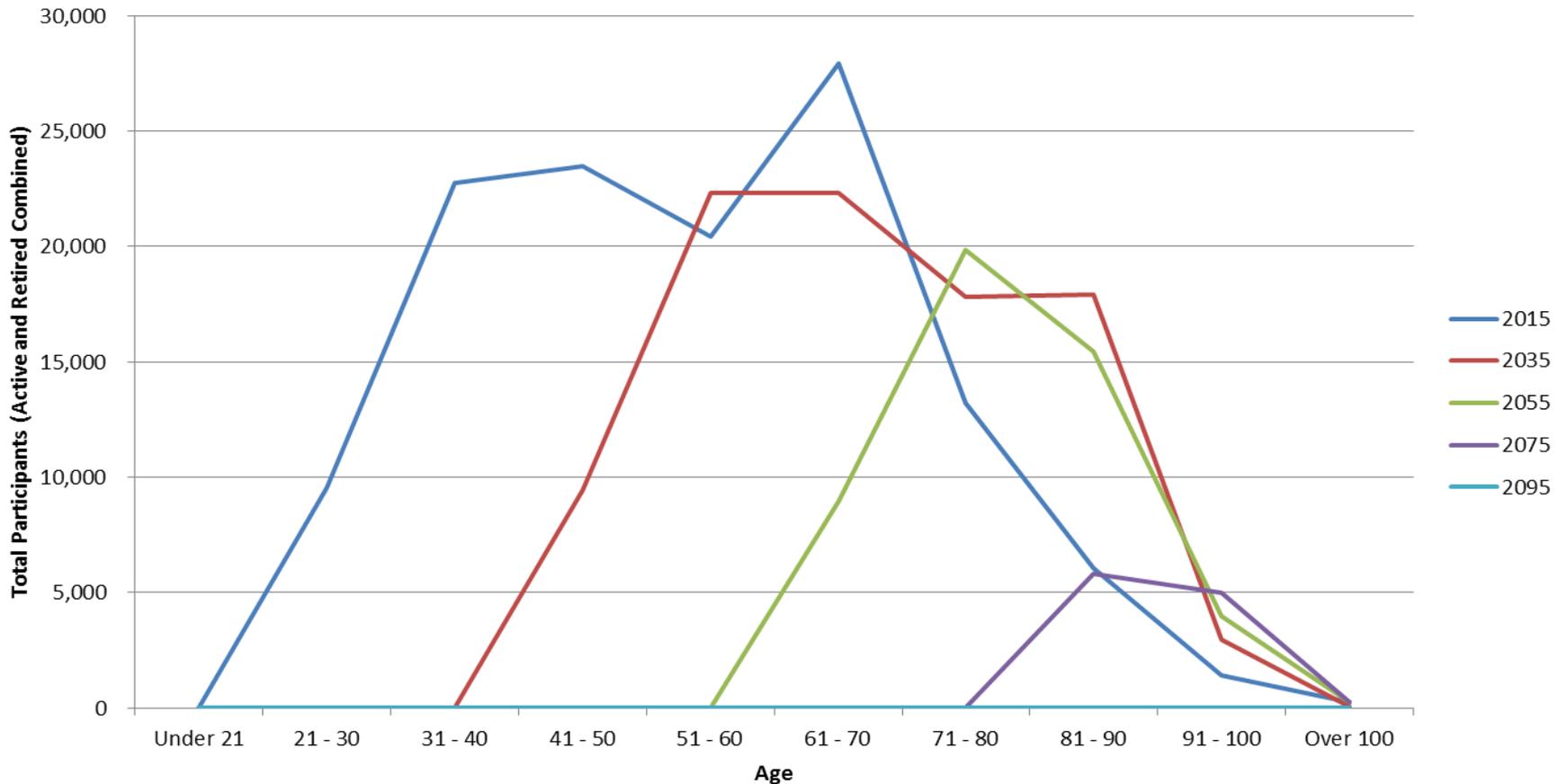


► Future Considerations and Potential Challenges

- Closed Plan (no new hires enter the plan)
 - Total payroll base used to determine contribution % will decrease
 - Level \$ UAL amortization payments will grow as a % of payroll
- Recognition of prior investment gains and losses
- Contribution rate and funded status volatility risk
 - Investment returns after June 30, 2017
 - Mortality improvements/salary growth/COLA

Legacy Teacher Participants by Age

TCRS Legacy Plan - Teacher
(80-Year Participant Age Band Projection)



Total Participants By Year:

2015: 125,106

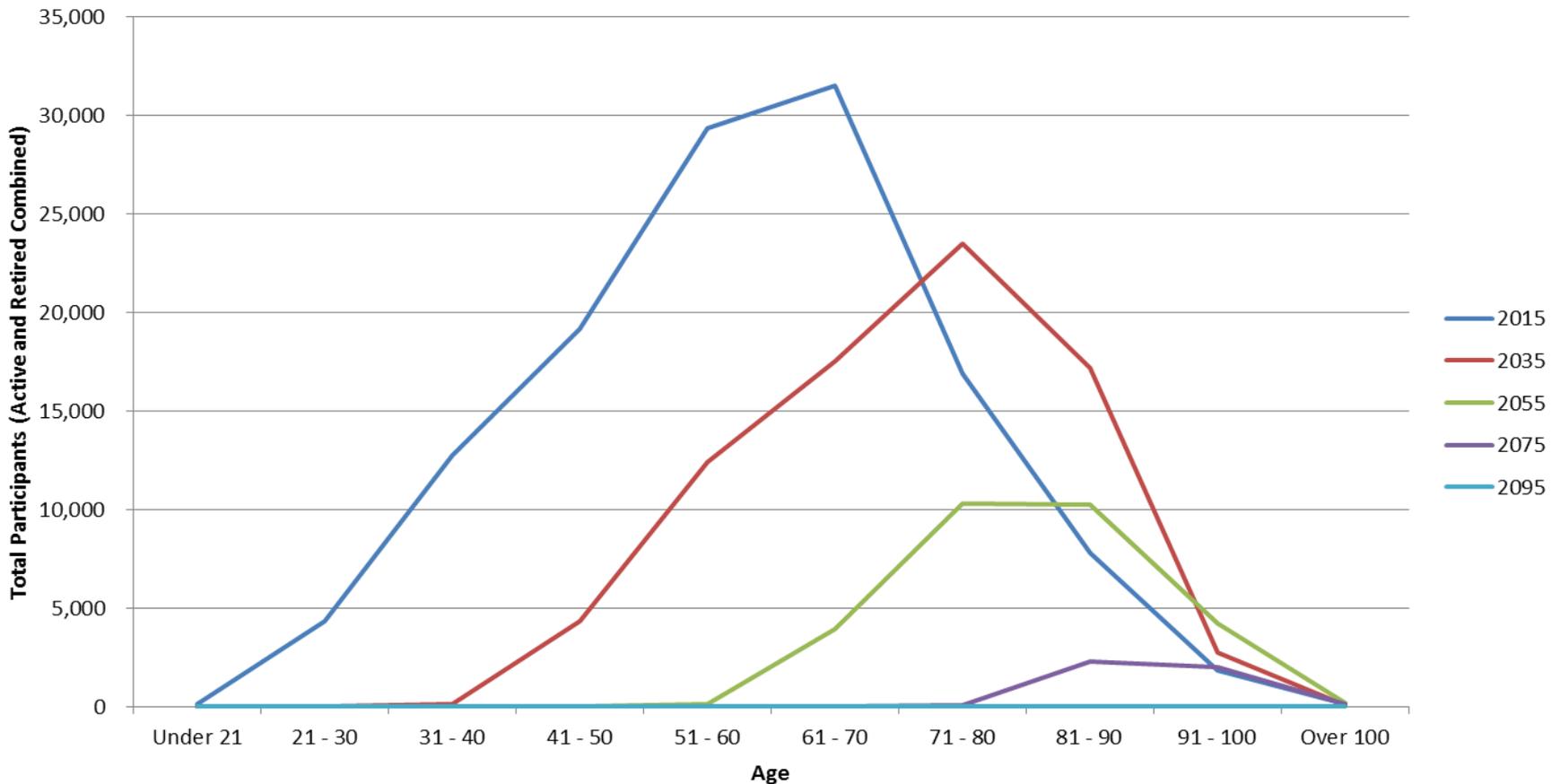
2035: 92,832

2055: 48,534

2075: 11,058

Legacy State Participants by Age

TCRS Legacy Plan - State
(80-Year Participant Age Band Projection)



Total Participants By Year:

2015: 123,861

2035: 77,798

2055: 29,042

2075: 4,515