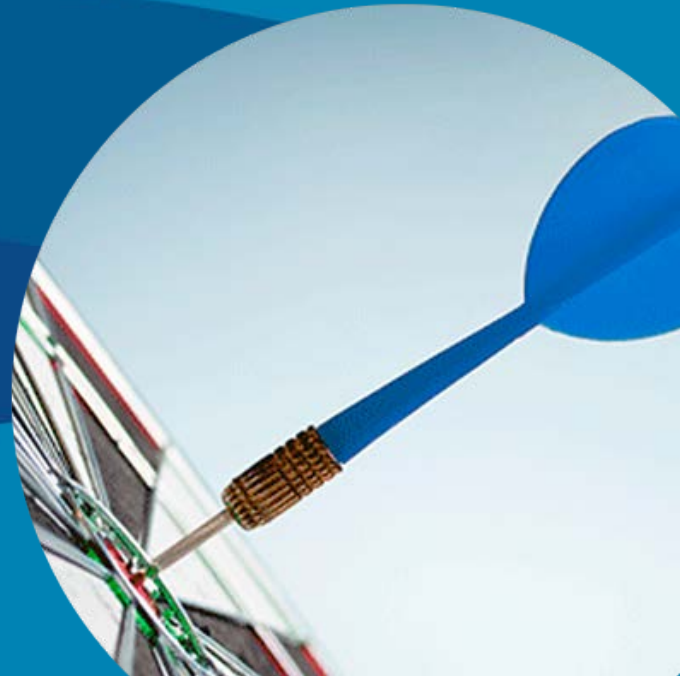# Texas Municipal Retirement System Actuarial Valuation Report as of December 31, 2019

May 28, 2020

Mark Randall
Joe Newton

Today's Agenda

- Summary of System-wide Results & Experience
  - Benefit changes
  - Asset Performance
- Liabilities with Projections
- Funded Status with Projections
- Amortization Policy Example and Equivalent Single Periods
- Contribution Requirements with Projections
- Sustainability Checklist
- Summary

Distribution of Changes: Payroll Weighted Total Changes in Full Retirement Rate
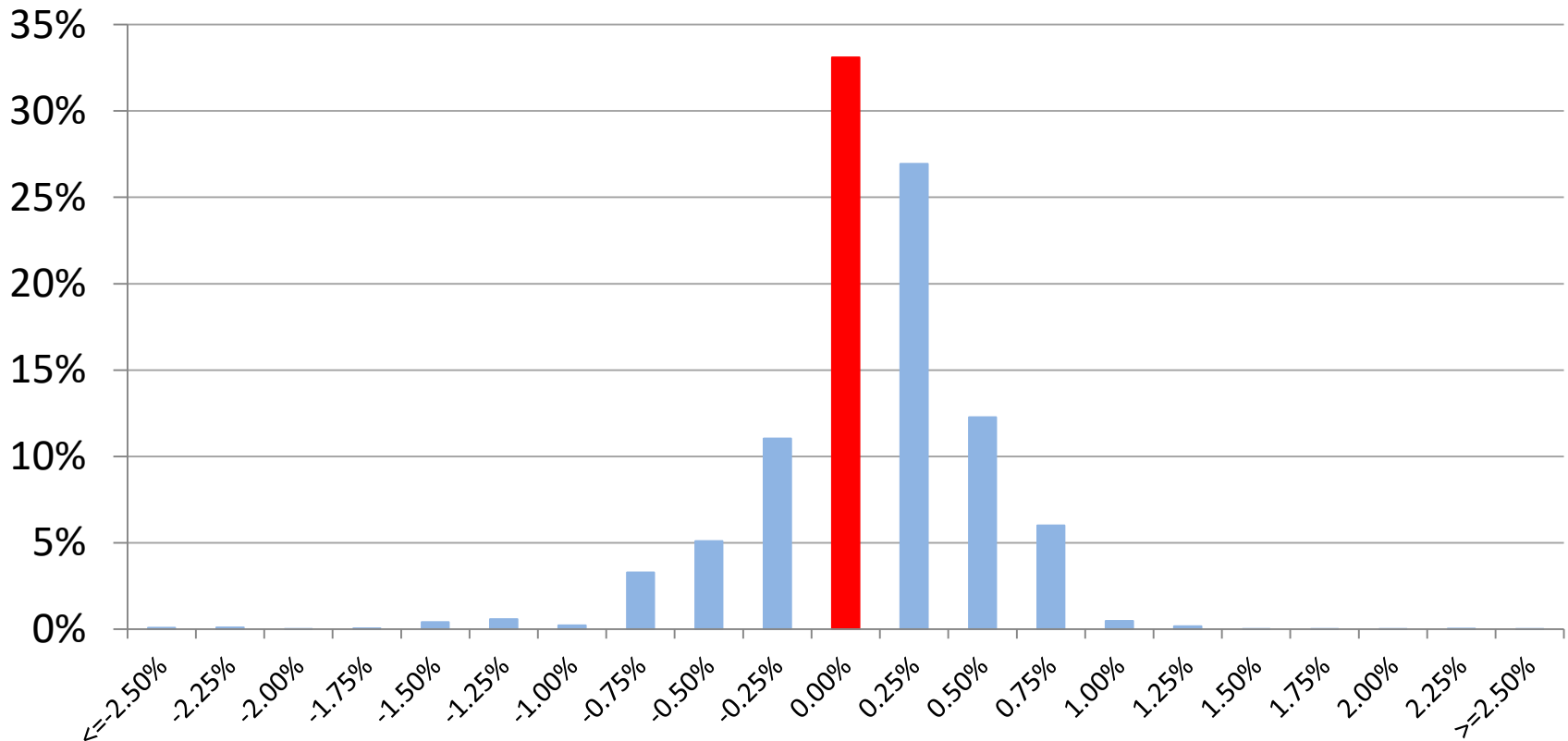
Does not include impact from changes to benefits
Rounded to nearest 0.25% change in rate

GRS

Summary of System-wide Results

$ amounts in millions	Dec 31, 2017 Valuation	Dec 31, 2018 Valuation	Dec 31, 2019 Valuation
Actuarial Accrued Liability (AAL)	$31,812	$33,731	$35,585
Actuarial Value of Assets	27,814	29,385	31,314
Unfunded Actuarial Accrued Liability (UAAL)	$3,998	$4,346	$4,271
Funded Ratio	87.4%	87.1%	88.0%
Average Funding Period (Years)	18.8	18.2	17.2
Full Contribution Rates:			
Straight Average	8.89%	8.97%	9.06%
Payroll Weighted Average	13.09%	13.58%	13.65%
Normal Cost %	8.43%	8.61%	8.72%
Prior Service %	4.66%	4.97%	4.93%

69 cities have a phase-in rate with 67 due change in assumptions & methods this year

GRS

Aggregate BAF Valuation ($ in millions)
Reconciliation of Unfunded Actuarial Accrued Liability ("UAAL")

	Change in UAAL	Impact on Funded Ratio	Impact on Full Rate
@ BOY	$4,346	87.1%	13.58%
Interest (6.75%)	293		
Amortization Payments	(340)	0.7%	-0.00%
Asset Performance	(56)	0.2%	-0.05%
Benefit Changes/New Cities	(35)	0.1%	-0.02%
Assumption/Method Changes	85	-0.2%	0.29%
Contributions different than Actuarially Determined	(19)	0.1%	-0.02%
Liability (Gains)/Losses	(3)	0.0%	-0.04%
Payroll Growth			-0.09%
@ EOY	$4,271	88.0%	13.65%

GRS

Non-Investment Experience

- Actual CPI of 2.29% was less than the 2.50% assumption, so liability for repeating COLAs was less than expected
  - System-wide, created a Liability Gain of about $15 million
  - 2018 CPI of 1.91% resulted in a system-wide gain of about $35 million
  - 2017 CPI of 2.11% resulted in a system-wide gain of about $20 million
  - 2016 CPI of 2.07% resulted in a system-wide gain of about $20 million
- Valuation uses 3-year smoothing on salaries
  - The 2018-2019 salary experience in aggregate was higher than expected (6.6% vs 5.0%), but this line item will vary based on who received what increase and if the City had USC
  - In general, salary increases greater than expected result in an actuarial loss

GRS

Summary of Benefit Changes

- Total Changes
  - 62 cities made changes that impacted the total retirement rate since the last valuation
    - Increases in Benefits   60   (61,49)
    - Decreases in Benefits   2   (3,5)

- Number of cities changing matching ratio, deposit rate, and/or eligibilities 42 (42,30)

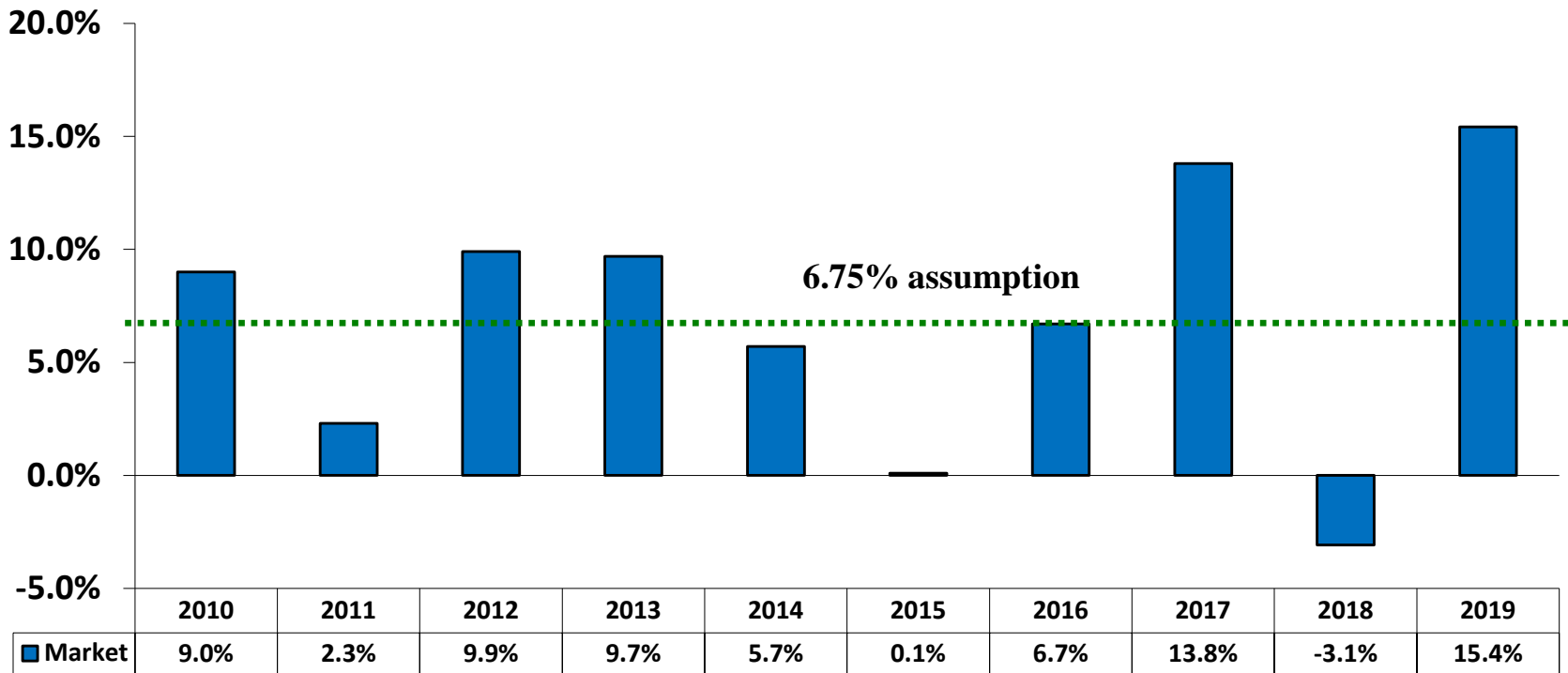Numbers in parentheses are the values for 2018 and 2017, respectively

GRS

Summary of Benefit Changes (cont.)

- **USC Changes**

	'19	'18	'17
Ad Hoc USC	11	11	11
New/Increase Repeating USC	4	5	1
Rescind/Decrease Repeating USC	0	2	4

- **COLA Changes**

Ad Hoc COLA	11	10	13
Adopted/Increased Repeating COLA	2	4	2
Rescind/Decrease Repeating COLA	2	3	3

Yields based on Market Value of Assets

6.75% assumption

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
■ Market	9.0%	2.3%	9.9%	9.7%	5.7%	0.1%	6.7%	13.8%	-3.1%	15.4%

~ 6.8% average compound return (on market value) over last 10 years

GRS

Market and Actuarial Values of Assets

|	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Market	$16.3	$18.0	$18.6	$20.5	$22.5	$23.7	$23.7	$25.2	$28.6	$27.7	$31.8
Actuarial	$16.3	$17.0	$18.3	$19.8	$21.3	$22.9	$24.3	$25.8	$27.8	$29.4	$31.3
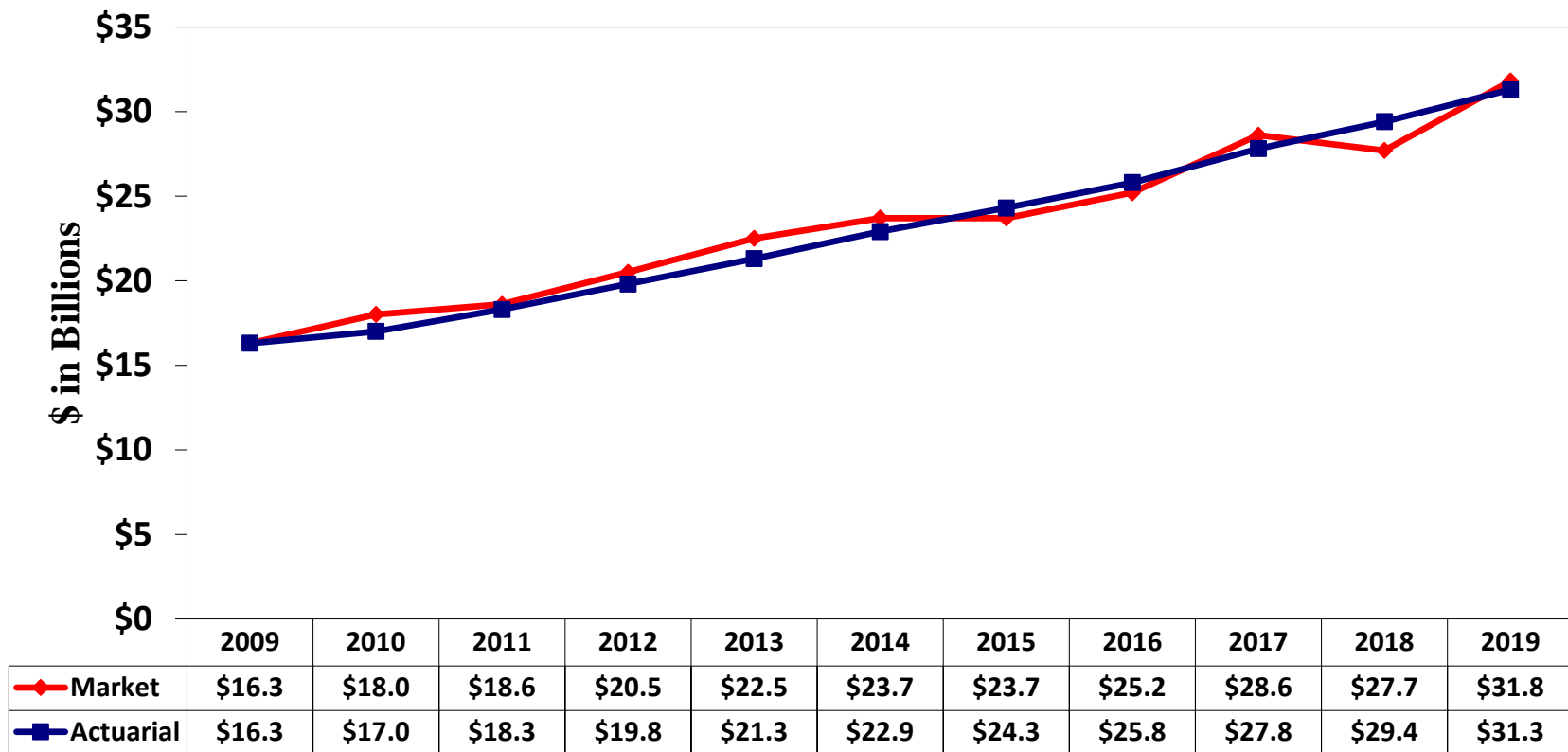
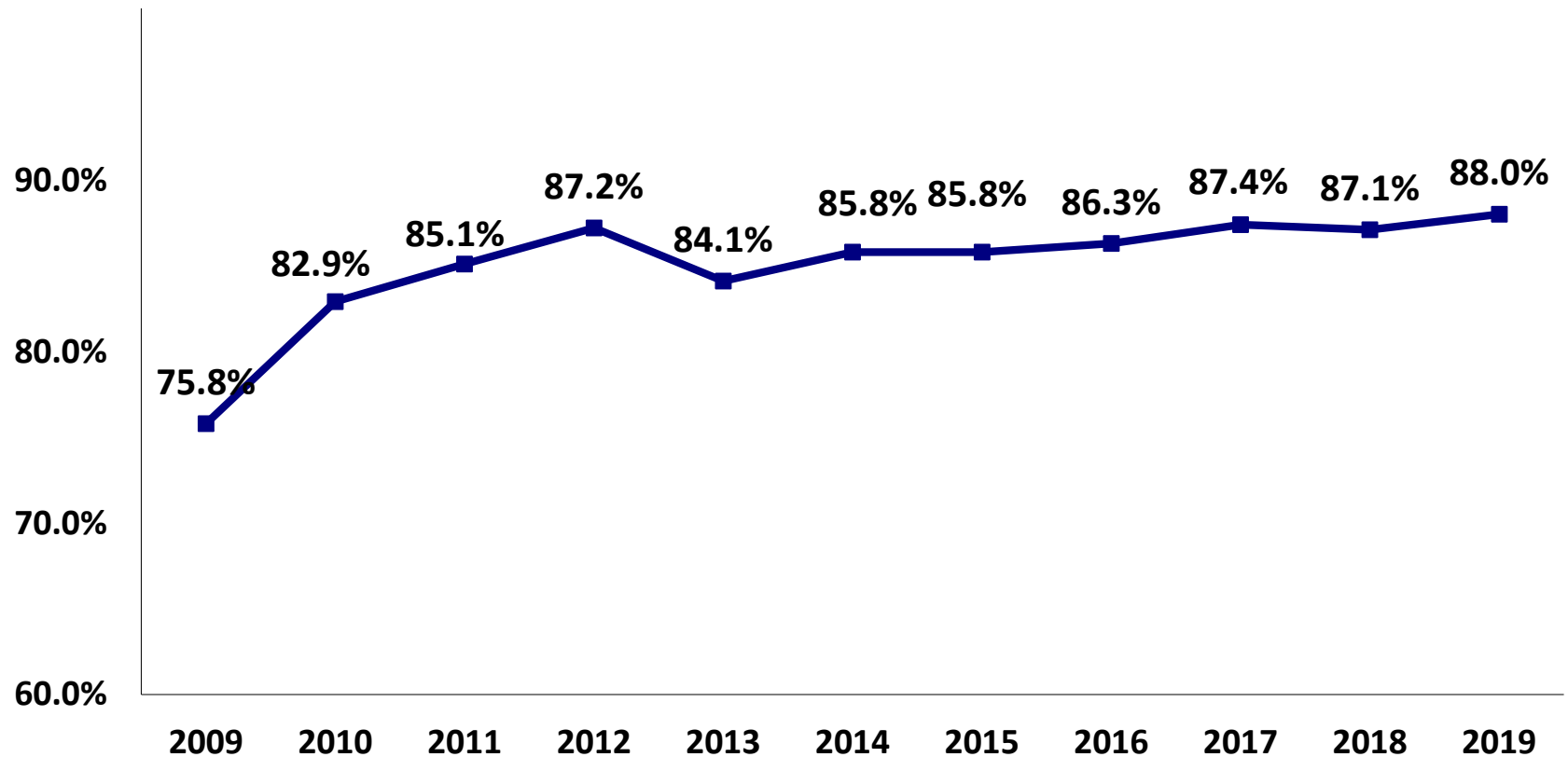# Actuarial Value of Assets (Smoothed) vs. Actuarial Accrued Liability (AAL)
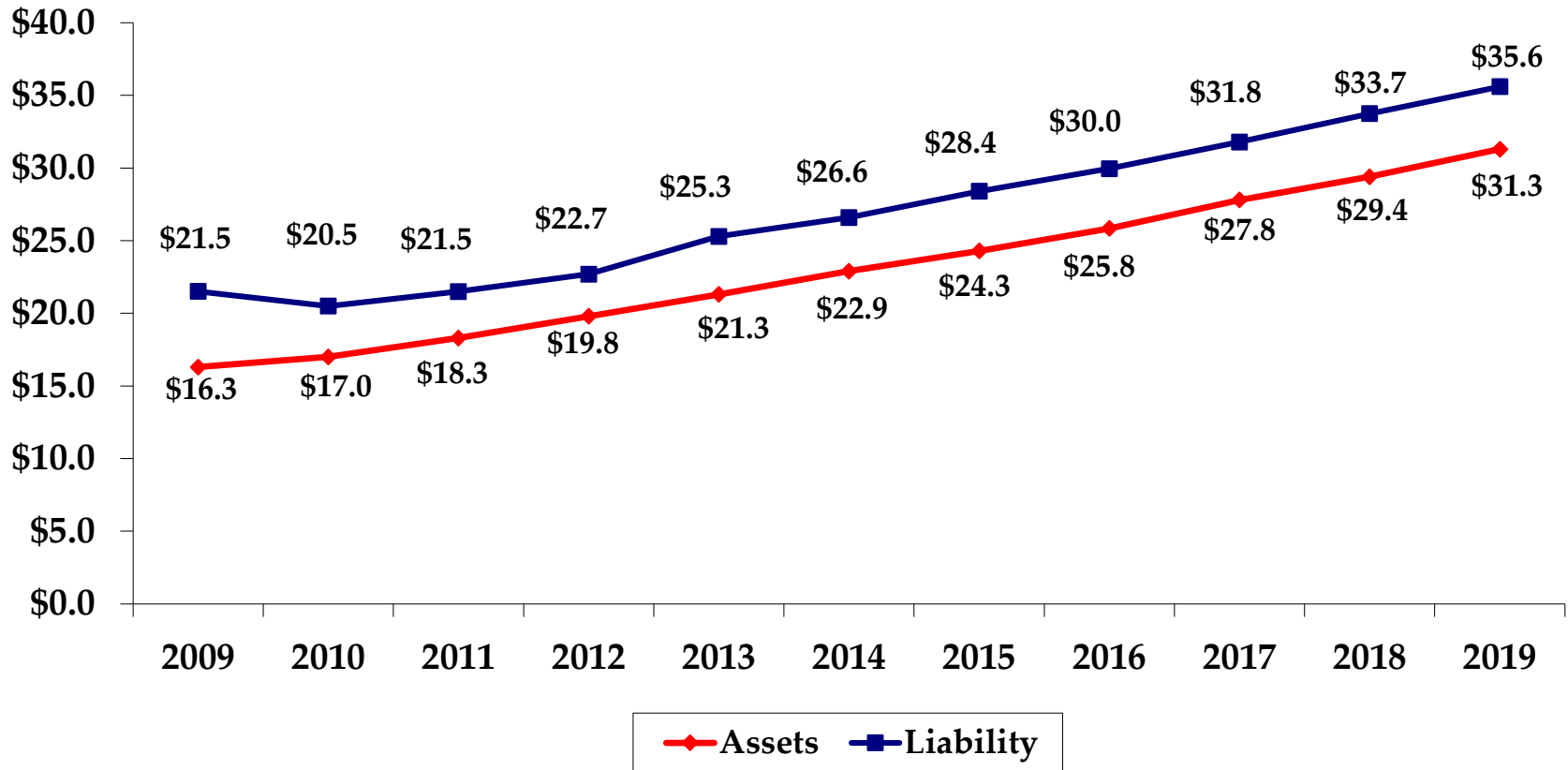
Liabilities for previous years reflect the previous structure before 2010, PUC cost method before 2013, and 7.00% discount rate before 2015
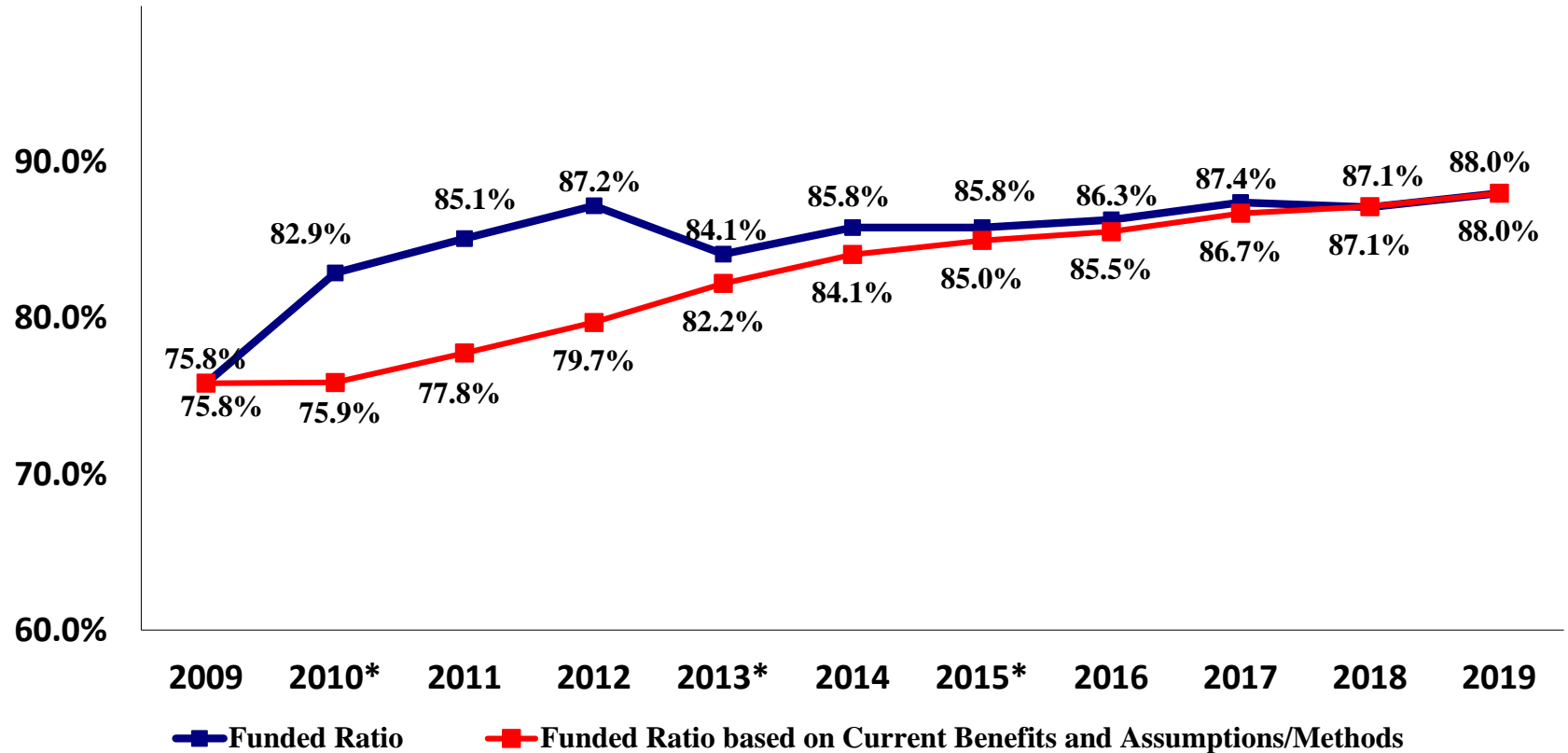
Relative Size of UAAL to AAL
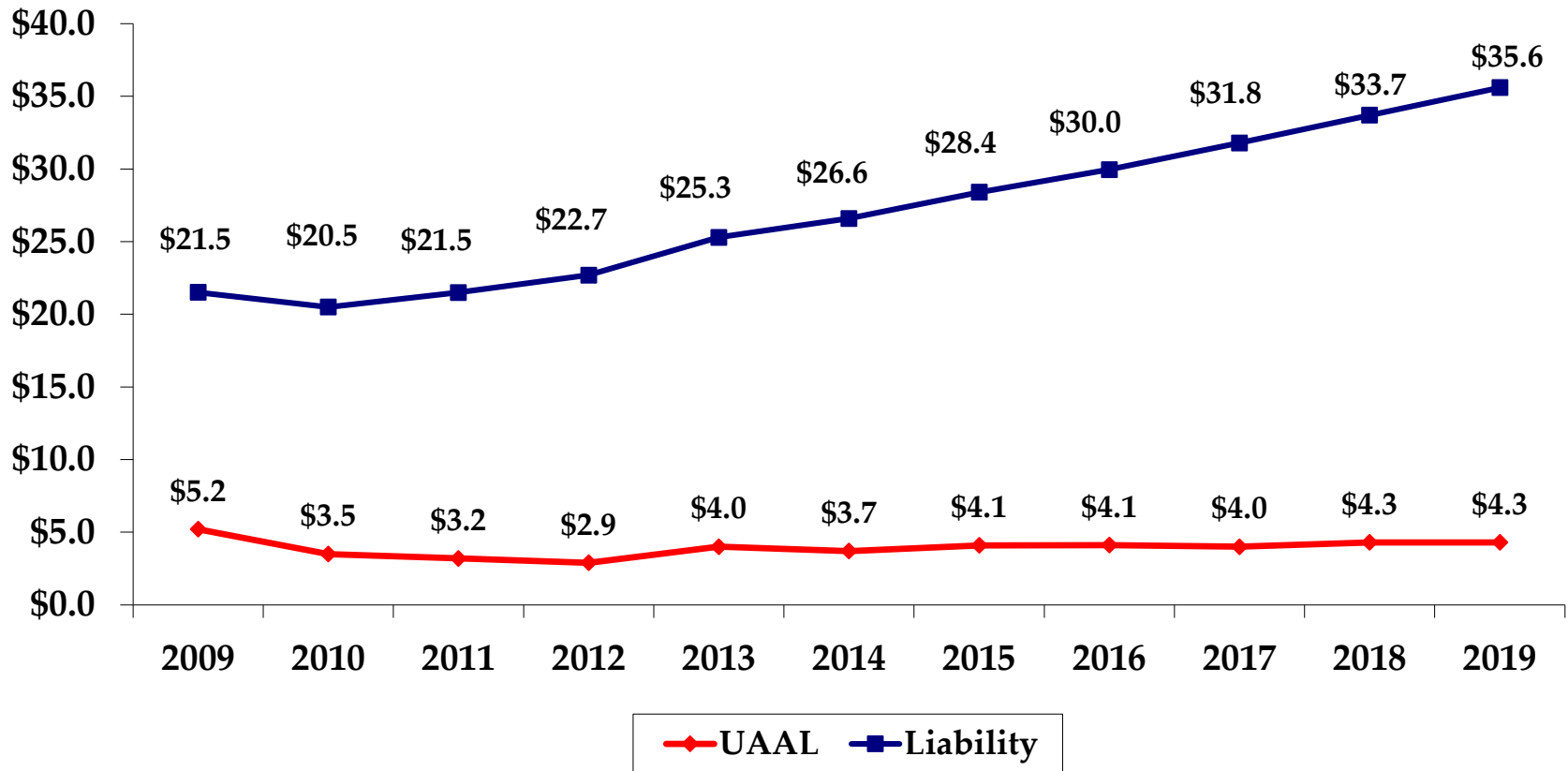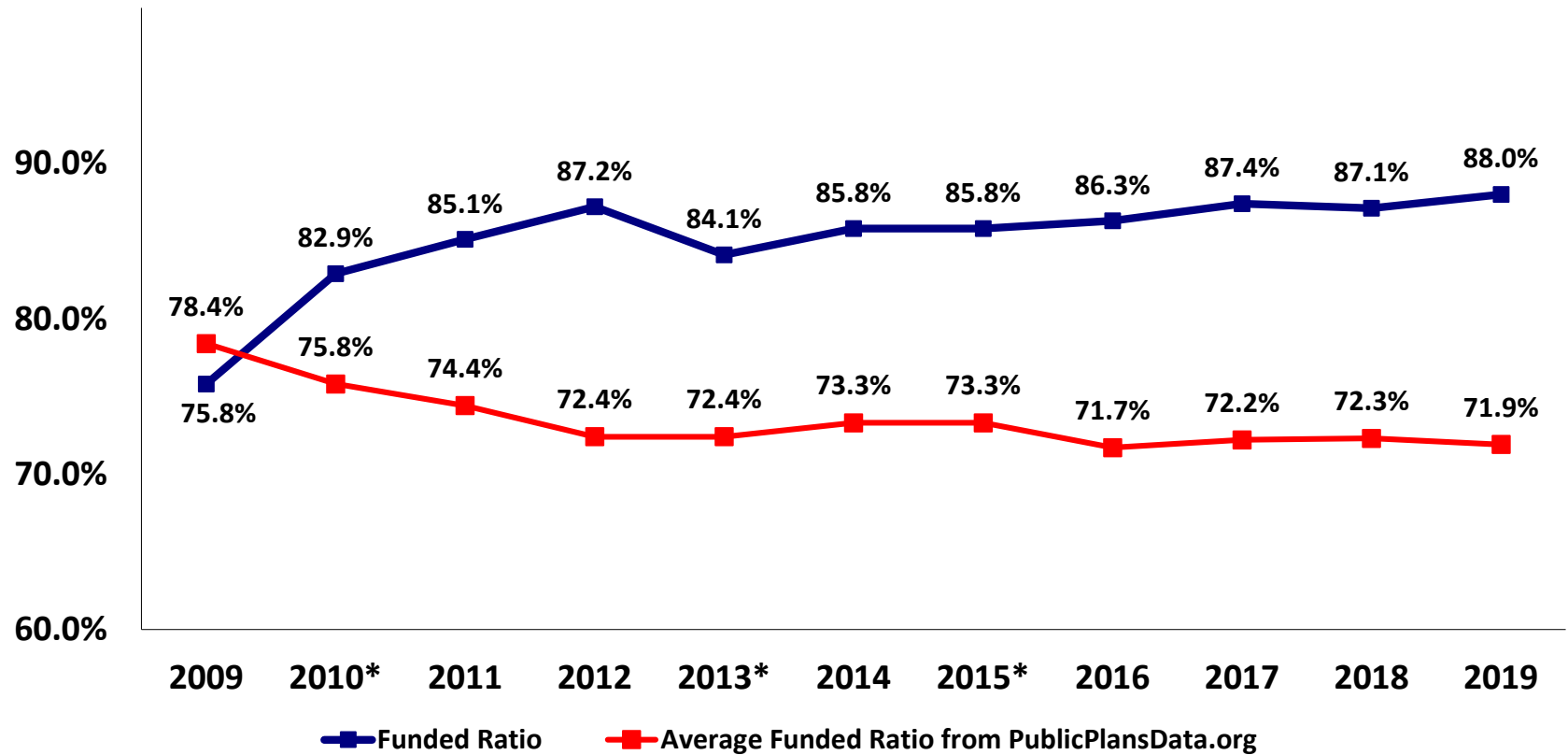
Funded Ratio Percentages

Funded Ratio Percentages:
## Normalized to Current Assumptions and Benefits

* Restructure in 2010, Change to EAN in 2013, 6.75% Discount Rate in 2015

Funded Ratio Percentages:
Compared to Peers

Legend: Funded Ratio (blue); Average Funded Ratio from PublicPlansData.org (red)

Year	Funded Ratio	Average Funded Ratio from PublicPlansData.org
2009	75.8%	78.4%
2010*	82.9%	75.8%
2011	85.1%	74.4%
2012	87.2%	72.4%
2013*	84.1%	72.4%
2014	85.8%	73.3%
2015*	85.8%	73.3%
2016	86.3%	71.7%
2017	87.4%	72.2%
2018	87.1%	72.3%
2019	88.0%	71.9%

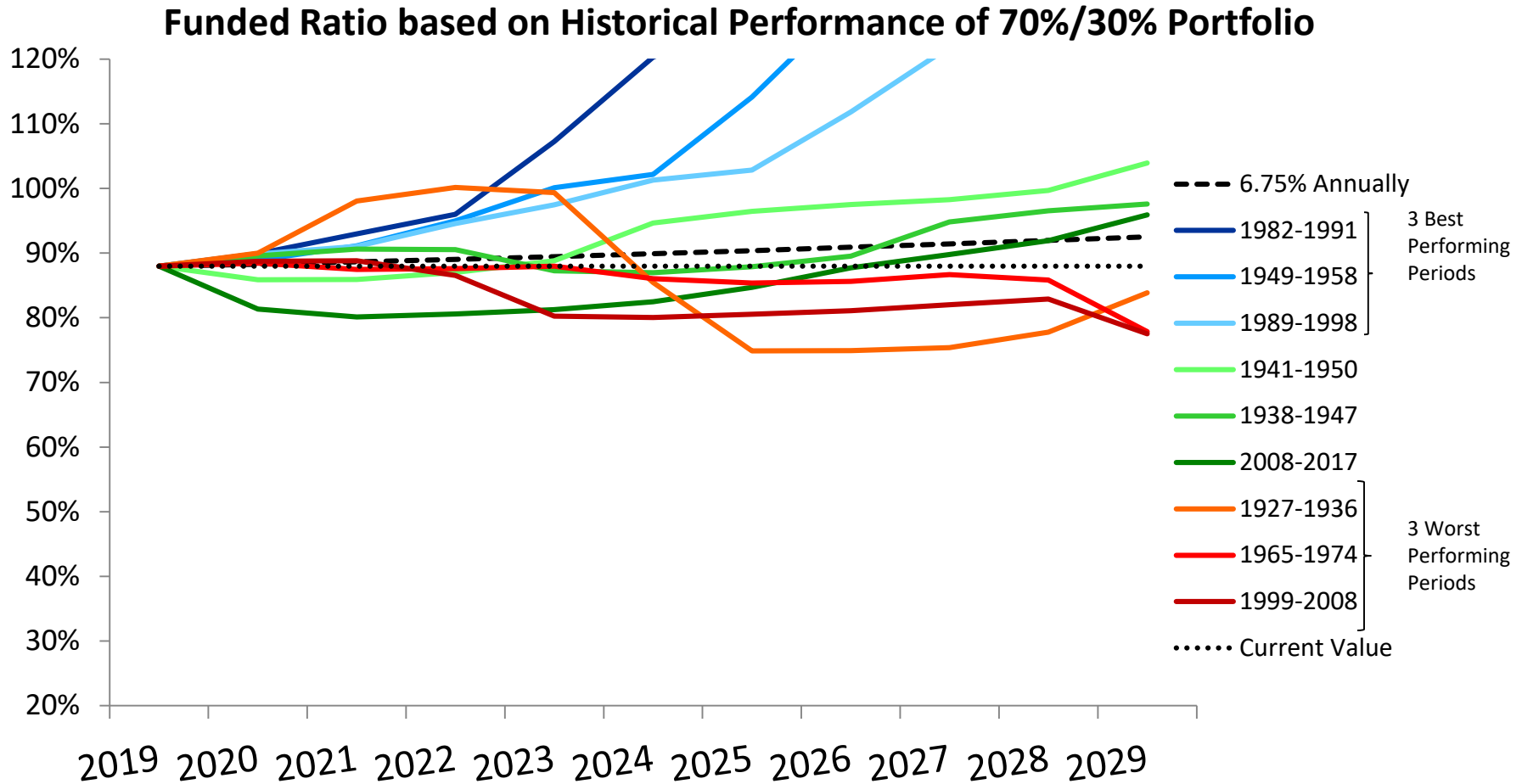- Restructure in 2010, Change to EAN in 2013, 6.75% Discount Rate in 2015
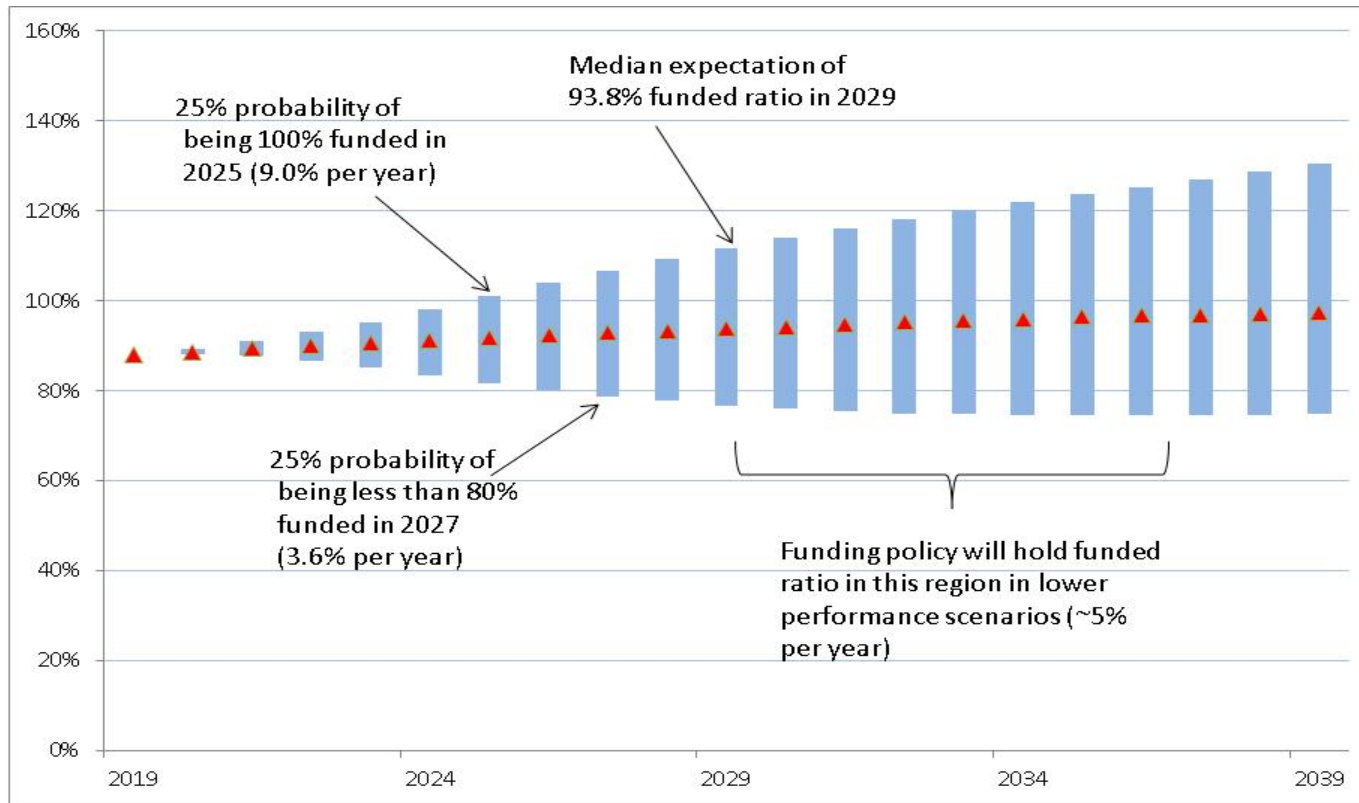
Projected Funded Ratio
(Longer Term)
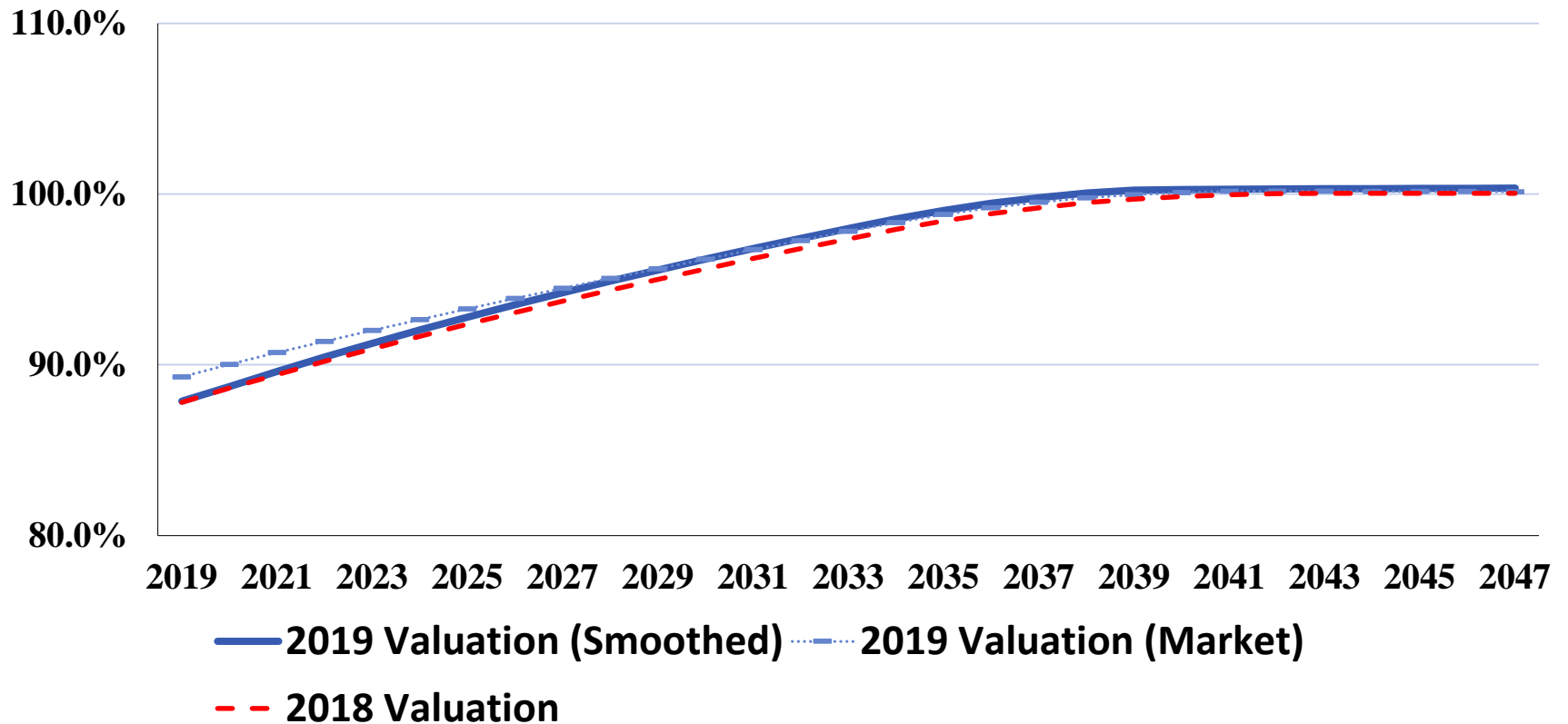
Assumes all assumptions are met in future years, including earning 6.75% on the labeled value of assets

# Projected Funded Ratio Based on Historical Scenarios

Funded Ratio based on Historical Performance of 70%/30% Portfolio

Legend:
- - - - 6.75% Annually
- ——— 1982-1991 — 3 Best Performing Periods
- ——— 1949-1958 — 3 Best Performing Periods
- ——— 1989-1998 — 3 Best Performing Periods
- ——— 1941-1950
- ——— 1938-1947
- ——— 2008-2017
- ——— 1927-1936 — 3 Worst Performing Periods
- ——— 1965-1974 — 3 Worst Performing Periods
- ——— 1999-2008 — 3 Worst Performing Periods
- ······ Current Value

Projected Funded Ratio: System-wide

160%

140%

120%

100%

80%

60%

40%

20%

0%

2019   2024   2029   2034   2039

25% probability of
being 100% funded in
2025 (9.0% per year)

Median expectation of
93.8% funded ratio in 2029

25% probability of
being less than 80%
funded in 2027
(3.6% per year)

Funding policy will hold funded
ratio in this region in lower
performance scenarios (~5%
per year)

Returns and
probabilities based
on results of 2019
experience and asset
allocation studies

- Assumes ADEC met each year
- Assumes continuation of current amortization policy & payroll grows at 2.75% per year
- Investment returns are only variable in the stochastic process

**GRS**

Distribution of Funded Ratio Percentages
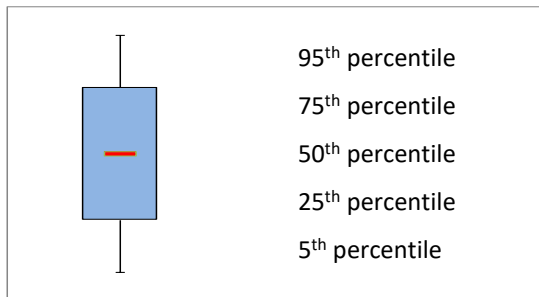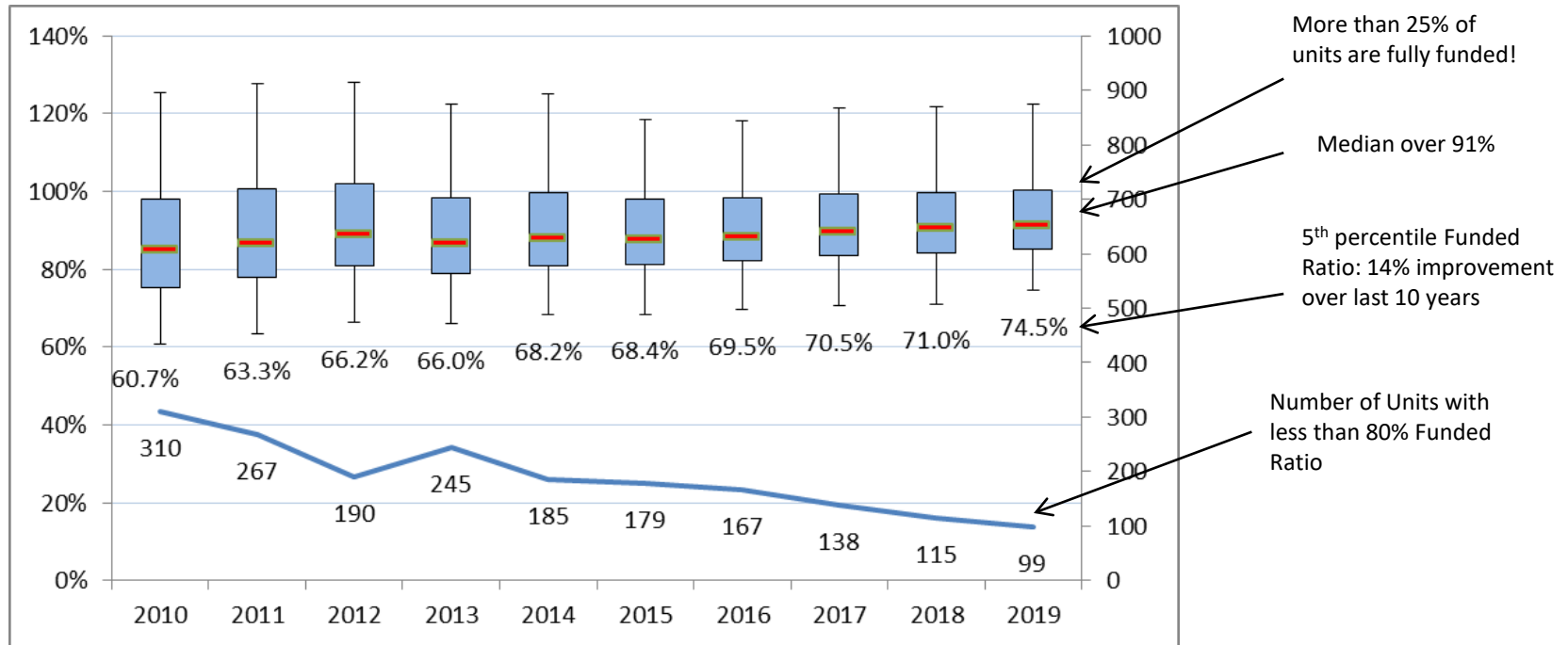
Amortization Layer Exhibit (Sample City)

Source	Original Balance	Remaining Balance as of December 31, 2019	Payment FY2020	Payment FY2021	Payment FY2022	Years Remaining
2013 Valuation (Fresh Start)	$ 25,099,074	$ 24,391,284	$ 1,976,998	$ 2,031,365	$ 2,087,228	17
2014 Experience	(1,320,133)	(1,281,027)	(103,832)	(106,687)	(109,621)	17
2015 Experience	475,691	492,596	30,289	31,122	31,978	26
2015 Actuarial Changes	(138,287)	(134,252)	(10,882)	(11,181)	(11,488)	17
2016 Experience	1,484,334	1,494,848	101,803	104,603	107,480	22
2017 Experience	(355,659)	(348,567)	(28,253)	(29,030)	(29,828)	17
2018 Experience	(154,344)	(152,567)	(12,366)	(12,706)	(13,055)	17
2019 Experience	(144,685)	(144,685)	(11,727)	(12,049)	(12,380)	17
2019 Experience Study	334,579	334,579	21,055	21,634	22,229	25
Unfunded Actuarial Accrued Liability		$ 24,652,209	$ 1,963,085	$ 2,017,071	$ 2,072,543	
Projected Payroll			$ 31,275,974	$ 32,136,063	$ 33,019,805	
Amortization Payment as a Percent of Payroll			6.28%	6.28%	6.28%	

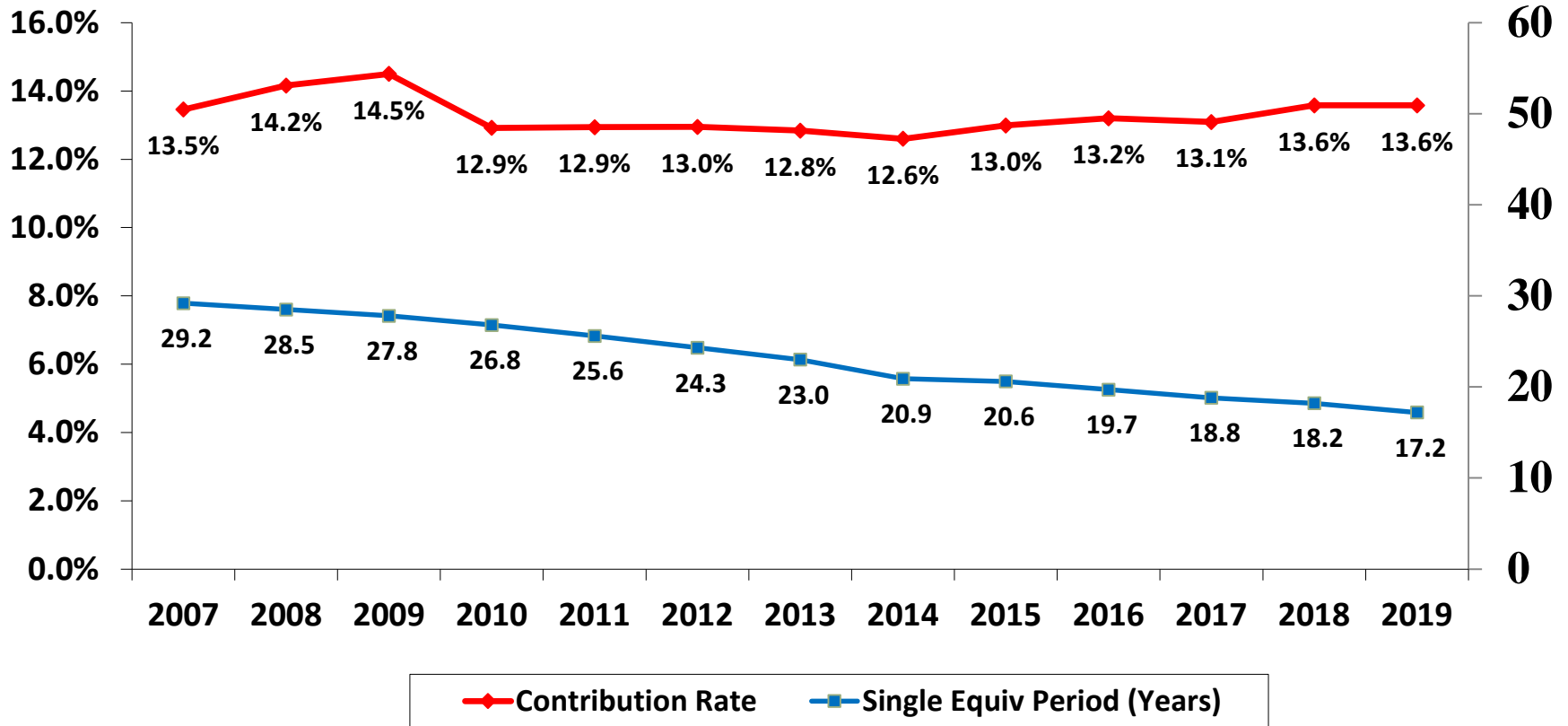**Equivalent Single Amortization Period = 17.4 years**

Distribution of Single Equivalent Amortization Periods
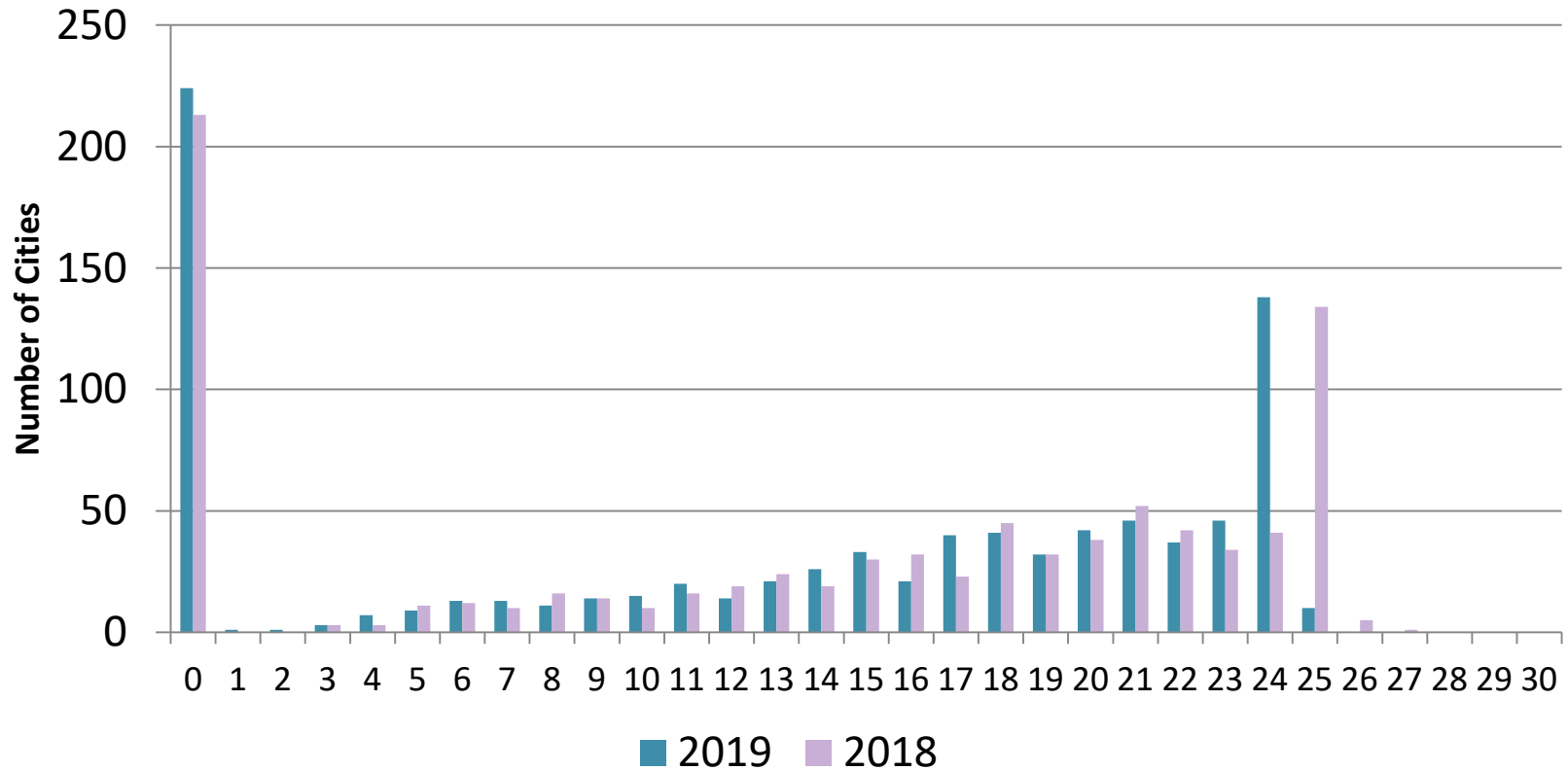
Remaining average period in years
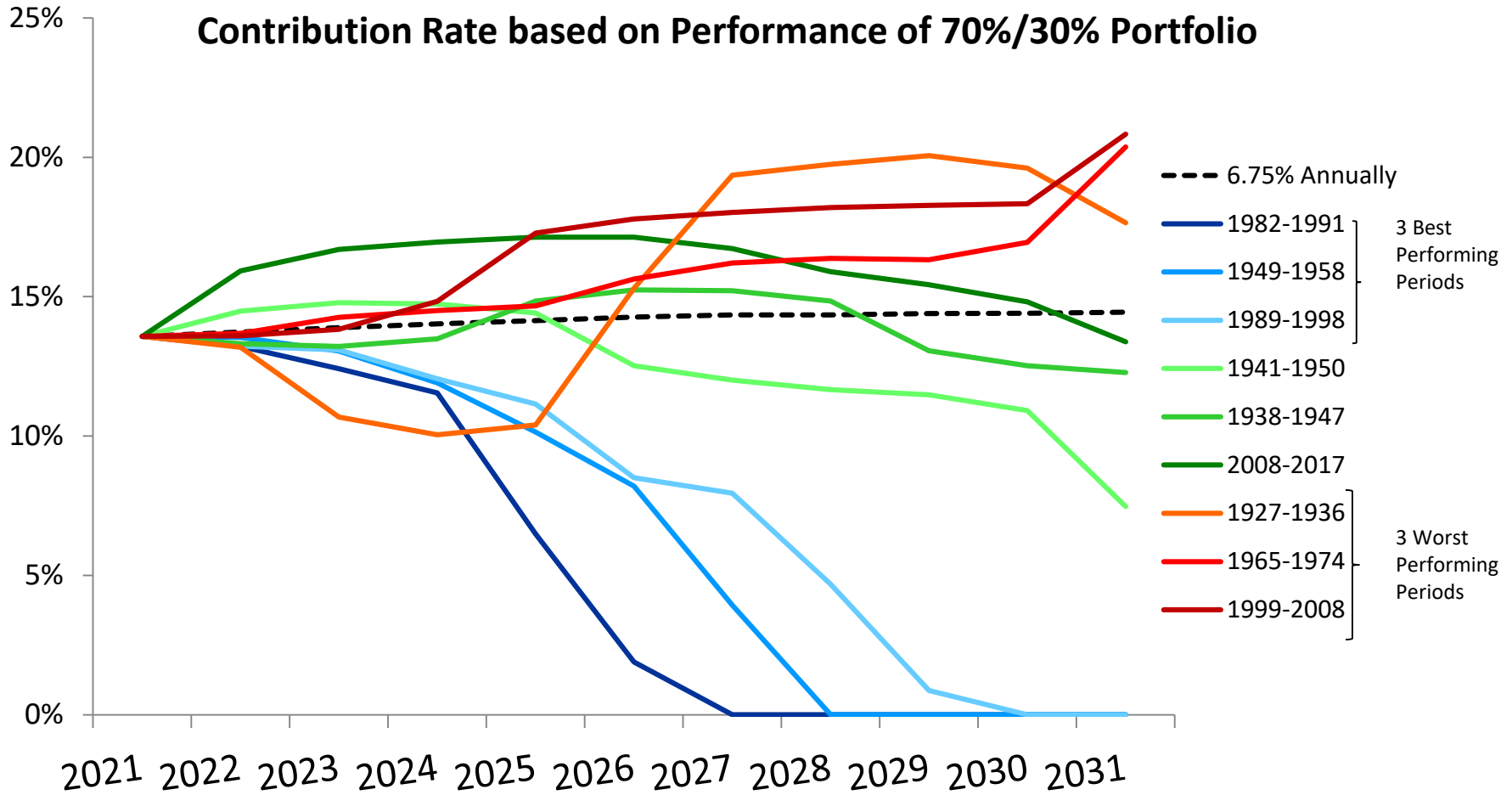0 would be overfunded

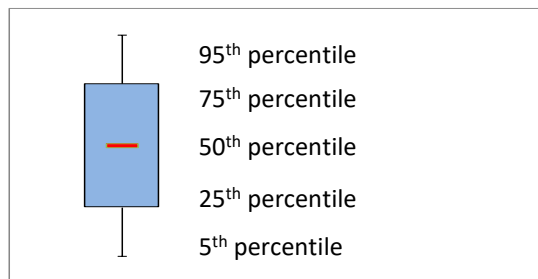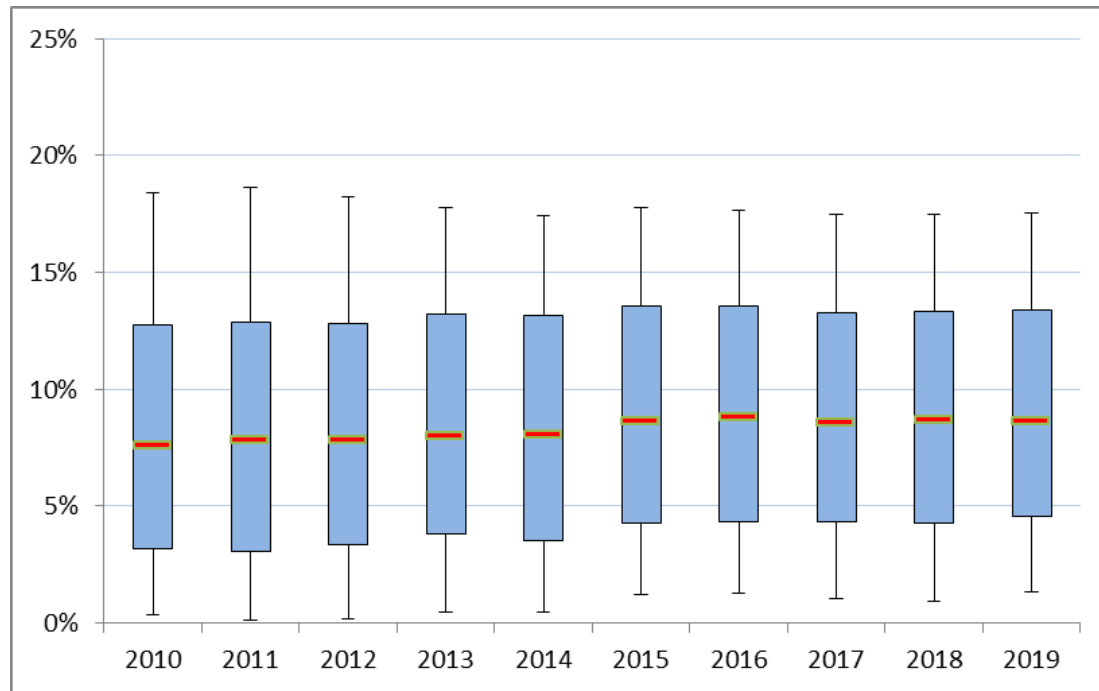# Historical Dollar Weighted Contribution Rates for TMRS

Contributions represent aggregate phase in minimums

Projected Dollar Weighted Contribution Rates Based on Historical Scenarios

Contribution Rate based on Performance of 70%/30% Portfolio

Legend:
- - - - 6.75% Annually
- 1982-1991 ⎫
- 1949-1958 ⎬ 3 Best Performing Periods
- 1989-1998 ⎭
- 1941-1950
- 1938-1947
- 2008-2017
- 1927-1936 ⎫
- 1965-1974 ⎬ 3 Worst Performing Periods
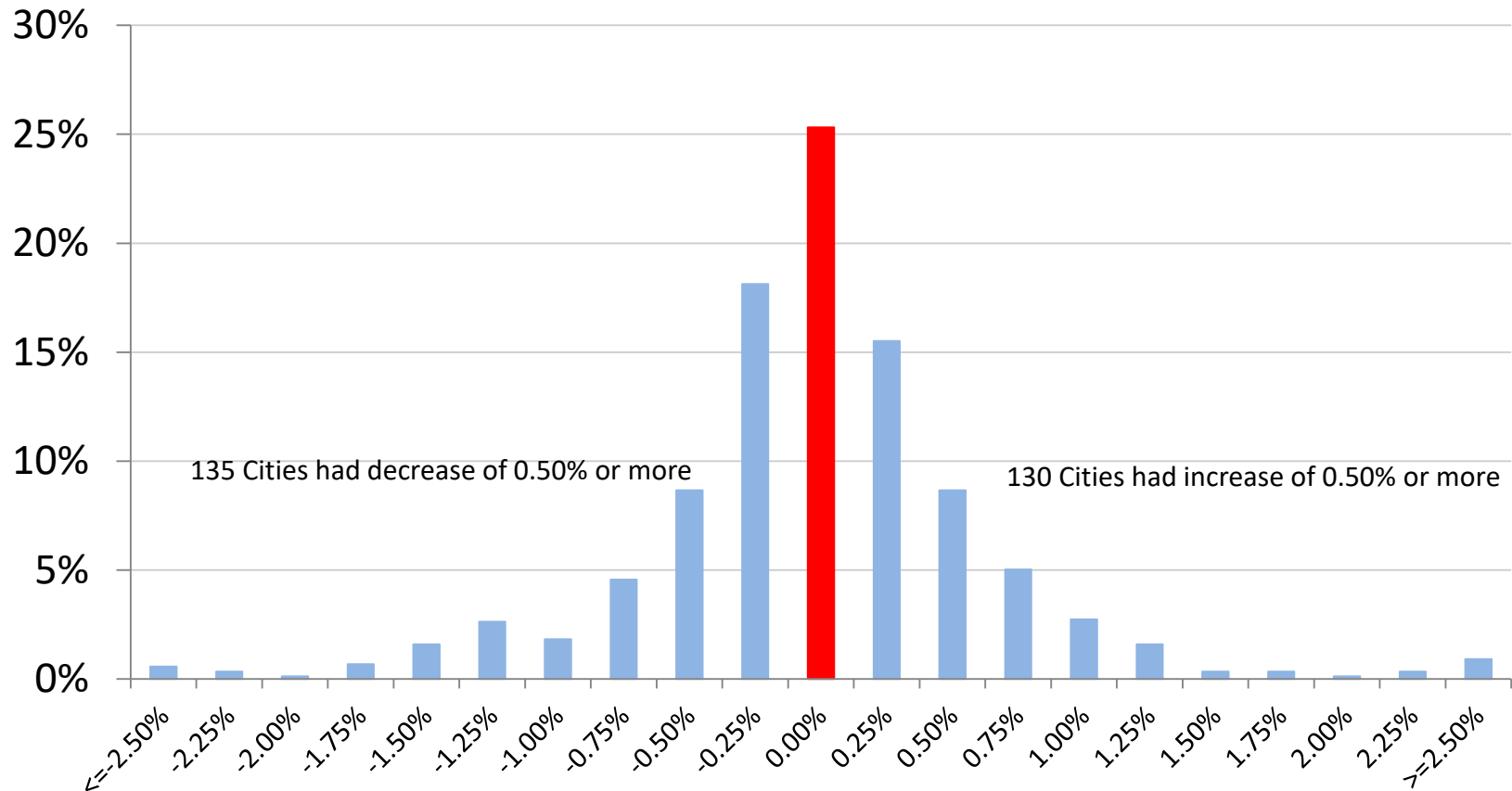- 1999-2008 ⎭

Distribution of Full Retirement Rate

The percentile represents the proportion of employers below the point. For example, the 75th percentile is 13.51%, meaning that 75% of cities have a rate less than 13.51%.

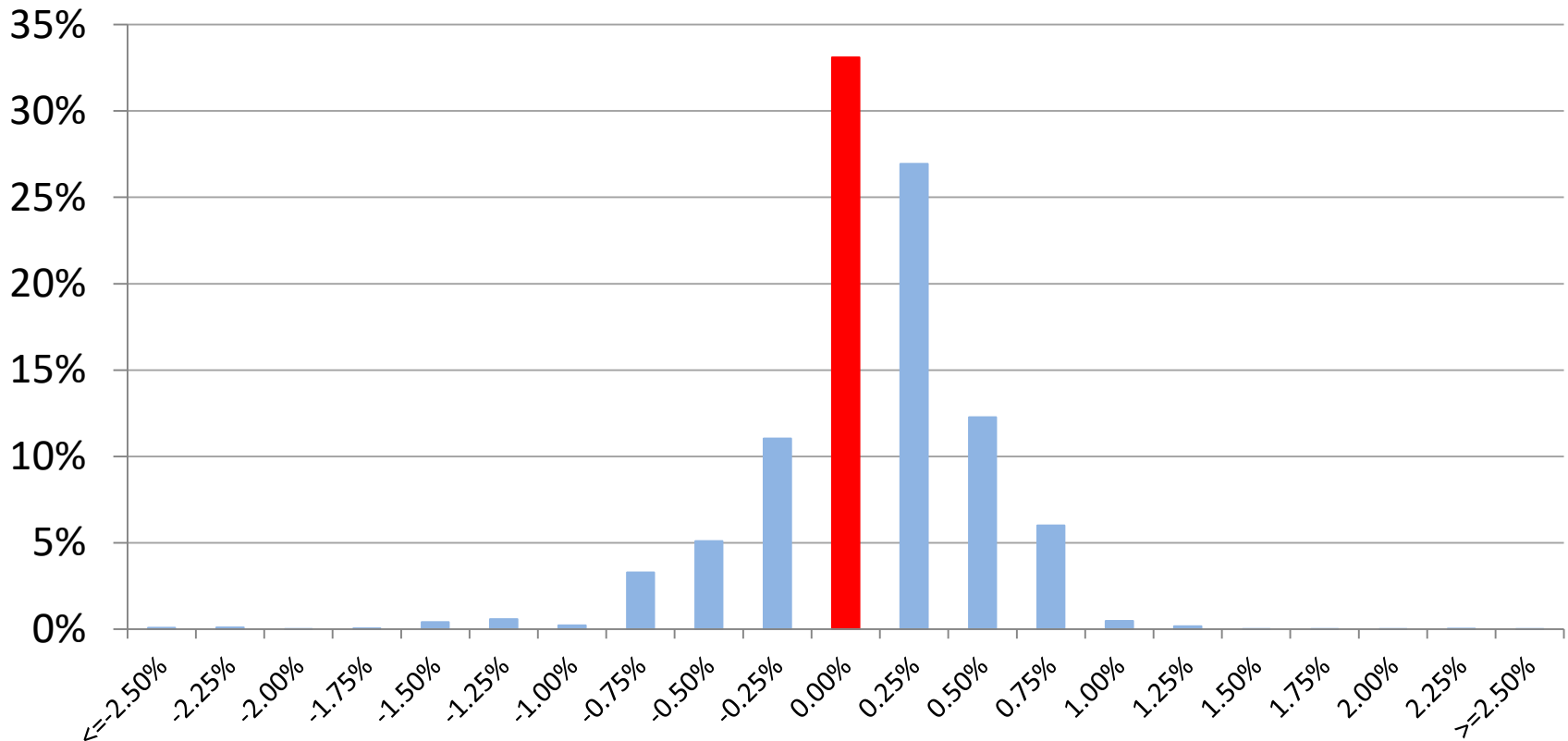# Distribution of Changes: By City
Total Changes in Full Retirement Rate

135 Cities had decrease of 0.50% or more

130 Cities had increase of 0.50% or more

Does not include impact from changes to benefits
Rounded to nearest 0.25% change in rate

Distribution of Changes: Payroll Weighted Total Changes in Full Retirement Rate
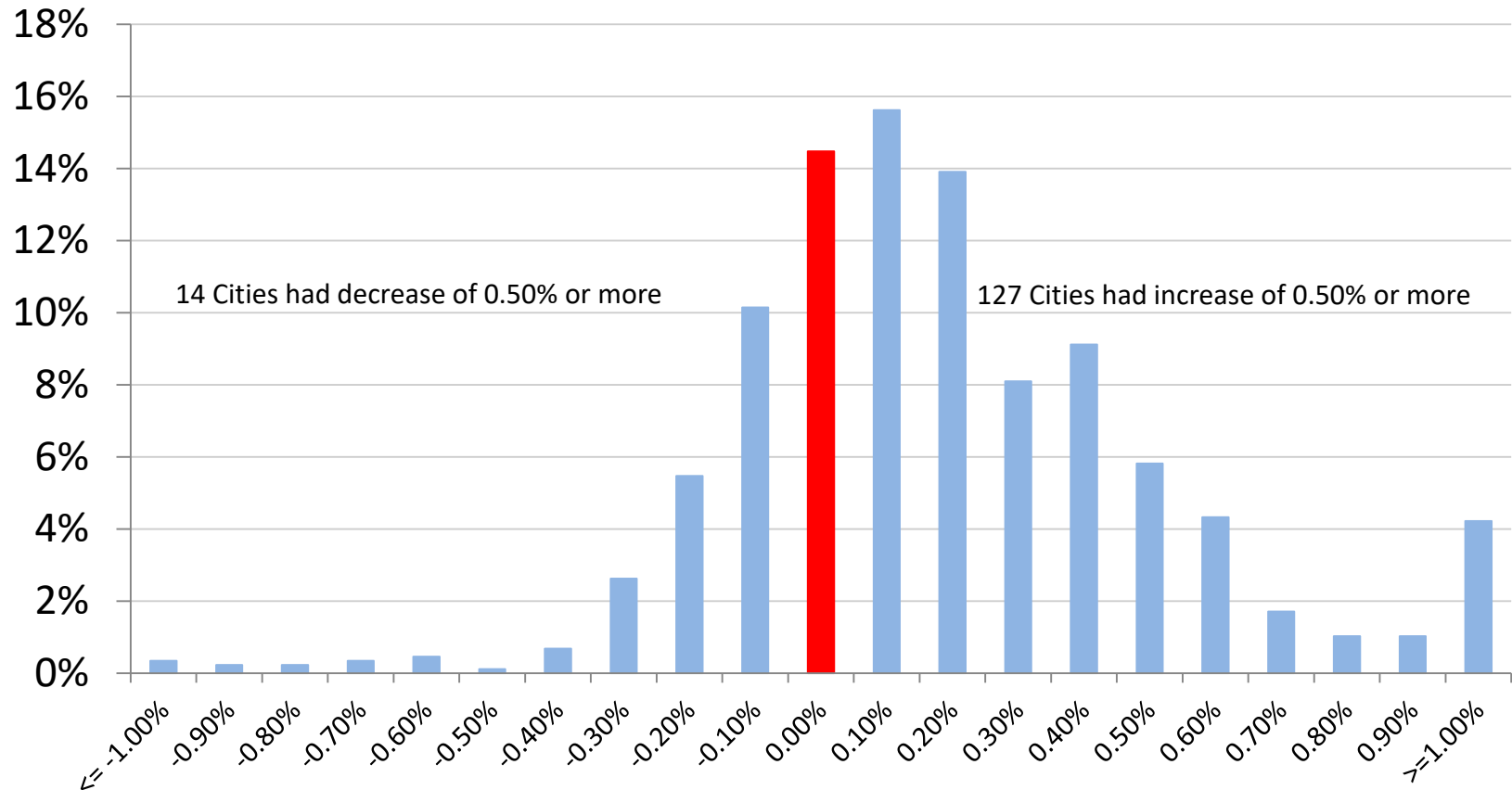

Does not include impact from changes to benefits
Rounded to nearest 0.25% change in rate

Distribution of Changes: Impact on Full Rate Due to Change in Assumptions

14 Cities had decrease of 0.50% or more

127 Cities had increase of 0.50% or more

Rounded to nearest 0.10% change in rate

GRS

Sustainability Checklist

- The following is a list of metrics that can be used to assess the sustainability of a pension plan.

- This can be used to gain a larger picture of sources of risk on a pension plan

- 5 star would be absolute best practice.   4 star is very good and usually sustainable. Below 3 stars are items that are either making sustainability more difficult or not adding in a positive way.

- Please note the aggregate results are much more meaningful than the impact of any one item.

- Also, it is unnecessary to achieve a 5 star result on each item to be considered sustainable. In fact, that type of result may suggest too much conservatism

Sustainability Checklist: Priorities

	Stars	Comment
Are there automatic adjustments to the program as experience unfolds?	7	Sum of next two items needs to be at least 6 stars
Contributions automatically adjust per statute or non-discretionary policy	★★★★★	20 Year layered amortization, no employer discretion, positive amortization.
Are any of the liabilities contingent on future experience?	★★	CPI COLA can provide slower growth during low inflation environments, benefits can be modified prospectively
Are there any benefits that are likely to be paid, but not reflected in the liabilities and contributions? Examples include ad hoc colas that occur regularly but are not advanced recognized, subsidized service purchases, or pay spiking patterns.	★★★★★ ★★★	No Some employers utilize ad hoc cola provisions, but there is a reasonable financing requirement. Employers have ability to enhance benefits, amortization period for retrospective benefit enhancements is 20 years.
Has the sponsor demonstrated a 10-year history of meeting an actuarially appropriate, required contribution?	★★★★★ ★★★	Most have 100% Some used forms of phase in
What is your ratio of non-contingent accrued liability to payroll?	★★★★	5.0
What is your longer term ratio of non-contingent accrued liability to payroll?	★★★	~7.0+
What is your short – intermediate term negative cash flow as a % of assets?	★★★★★	<1%, minimal risk of spikes in payouts. Multiple Employers lessens fluctuations.
What is your longer term negative cash flow as a % of assets?	★★★★★	3-4%

GRS

Sustainability Checklist: Other Factors

	Stars	Comment
Based on current practices and assumptions, is your UAAL expected to be lower 10 years from now?	★★★★★	Yes - About 30% smaller
What is the amortization period for the current UAAL based on the required contribution?	★★★★★	17 Years, Positive Amortization
What is the sum of the smoothing period and amortization period for new losses?	★★★★★	<30 Years
Is your funded ratio higher than it was 10 years ago?	★★★★★	Yes
Does the contribution as a percentage of payroll change each year regardless of experience?	★★★	Yes, will increase or decrease based on formula and results from that year. 20 Year layered does have higher end year to year volatility. Cash Balance plan design dampens volatility.
Does the Board regularly review actuarial assumptions?	★★★★	All assumptions reviewed every 4 years (5 star would include a macro economic every 2 years)
What is the likelihood of meeting or exceeding the assumed return assumption over the next 20 years based on analysis?	★★★★	** for Between Arithmetic and Geometric Mean (45-50%) and ** for being in lower quartile of public funds
Assumed rate of payroll growth for amortization purposes?	★★★★★	Equal to the wage inflation assumption with a stable active population and supported by historical 10-year average of past payroll growth, and adjustments if population declining
What is the annual percent change in active population last 10 years?	★★★★★ ★★	+1% system-wide 234 cities have a trend of a declining population
What is your current active to retiree ratio?	★★★★	1.6 (1.6 to 1.9)
What is your longer term active to retiree ratio?	★★	1.1-1.3

Sustainability Checklist

- TMRS grades out very well on the checklist
  - Required, actuarially determined contributions
  - Current UAAL in positive amortization
  - Reasonable payroll growth assumptions
  - Manageable short and long term cash flow needs

- Items to pay attention to
  - Longer term liability (or asset) to payroll ratios will increase contribution rate volatility
  - Capital market expectations continue to contract, continues to become more difficult to generate safe/passive earnings

In Summary

- Overall System-wide "health" continues to improve
  - Median funded level continue to improve
  - Contributions rates have remained relatively stable

- The expectation is for a slowly increasing funded ratio over the next few valuations and continued stability in the contribution rates, System-wide