

SAILING INTO RETIREMENT

2018

TMRS Annual Seminar



Presentations available at www.tmrs.com/ats.php

SAILING INTO RETIREMENT



TMRS' Anchor

Actuarial Soundness
and Investment Earnings

Presentations available at www.tmr.com/ats.php

TMRS' Anchor

- Investments Overview
 - T.J. Carlson, Chief Investment Officer, TMRS
- Actuarial Update
 - Mark Randall, CEO, GRS
- Contribution Rate Stabilization
 - Leslee Hardy, ASA, FCA, EA, MAAA
Director of Actuarial Services, TMRS



Investments Overview – Tracking and Analyzing Investments



Asset Allocation Process

Investment Policy Statement: *Asset Allocation Reviews*

- Formal pension financial (asset-liability) study will be conducted at least every five years (2019)
- Formal asset allocation study will be conducted at least every three years to verify or amend the targets
- Strategic Target Allocation will be reviewed at least annually to ensure that the long-term return objective and risk tolerance continues to be appropriate for the current environment and the Board's goals.

Objective Setting

- **RARELY CHANGES:** overarching goal of the Investment program

Strategic Target Allocation

- **LONG TERM DECISION** subject to change based on periodic reviews

Asset Class Structure

- **EVOLVING DECISIONS** based on opportunities to improve risk/return trade-off

Manager Selection

- **ONGOING DECISIONS** stem from asset class structure decisions and manager evaluations



Asset Allocation Process

Investment Policy Statement: *Investment Beliefs*

The investment beliefs of the Board are based on capital market theories that are generally accepted and followed by institutional investors, who by definition are long-term oriented investors. These beliefs hold that¹:

1. Increasing risk is compensated
2. Risk can be diversified
3. Relative performance of asset classes is reasonably consistent
 - (Return, Volatility and Correlation assumptions are used to represent investment opportunities)
4. The primary determinant of return is asset allocation
 - (The choice of Strategic Target Allocation is the most important investment decision)
5. The risk of tactical shifts between asset classes is hard to diversify and must be used judiciously
6. Active management can improve returns and is inversely dependent on market efficiency
 - (Choices of sub-asset classes, Active Strategies, and Managers are expected to contribute to total performance)

Risk Tolerance²: Risk commensurate with a 6.75% target rate of return



1. Summarized from the TMRS Investment Policy Statement (IPS)

2. TMRS IPS Sec. IV. Investment Objective . . . The Board is responsible for approving an Actuarial Return Assumption and accepting that the commensurate risk posture of that portfolio is in line with the Board's Risk Tolerance.

Asset Allocation Process

Investment Policy Statement: *Asset Allocation Policy*

- The Board has adopted the following framework for making asset allocation decisions.
 - The Board will adopt a Strategic Target Allocation that must deliver:
 1. A representation of the Board's long-term return objective with its implied Risk Tolerance;
 2. Sufficient confidence for the Board to “stay the course” given extreme market moves; and
 3. A benchmark against which to measure performance.



Asset Allocation Inputs

Asset Class	2017			2018			Change (2018 - 2017)		
	Nominal Return (Arith.)	Risk (St. Dev.)	Nominal Return (Geo.)	Nominal Return (Arith.)	Risk (St. Dev.)	Nominal Return (Geo.)	Nominal Return (Arith.)	Risk (St. Dev.)	Nominal Return (Geo.)
Large/Mid Cap US Equity	7.00%	17.75%	5.56%	6.75%	17.75%	5.30%	-0.25%	0.00%	-0.25%
Small Cap US Equity	7.50%	21.25%	5.46%	7.25%	21.25%	5.20%	-0.25%	0.00%	-0.25%
Broad US Equity	7.05%	17.80%	5.60%	6.80%	17.80%	5.35%	-0.25%	0.00%	-0.25%
Dev'd Large/Mid Cap Int'l Equity	8.25%	19.00%	6.62%	8.00%	19.00%	6.37%	-0.25%	0.00%	-0.25%
Dev'd Small Cap Int'l Equity	8.50%	23.00%	6.14%	8.25%	23.00%	5.89%	-0.25%	0.00%	-0.26%
Emerging Markets Equity	10.75%	29.00%	7.14%	10.25%	29.00%	6.62%	-0.50%	0.00%	-0.51%
Broad International Equity	8.85%	20.65%	6.94%	8.60%	20.80%	6.66%	-0.25%	0.15%	-0.28%
Global Equity	7.90%	18.30%	6.38%	7.65%	18.35%	6.12%	-0.25%	0.05%	-0.26%
Intermediate Duration Fixed Income	3.50%	6.00%	3.33%	3.50%	6.00%	3.33%	0.00%	0.00%	0.00%
Non-US Dev'd Sovereign Fixed Income UH	2.25%	10.50%	1.72%	2.25%	10.50%	1.72%	0.00%	0.00%	0.00%
TIPS	3.75%	6.25%	3.56%	3.75%	6.25%	3.56%	0.00%	0.00%	0.00%
Low Duration Fixed Income	2.50%	3.50%	2.44%	3.00%	3.50%	2.94%	0.50%	0.00%	0.50%
Long Duration Fixed Income	4.00%	11.50%	3.37%	3.50%	11.50%	2.87%	-0.50%	0.00%	-0.50%
High Yield	6.00%	15.00%	4.95%	5.50%	15.00%	4.45%	-0.50%	0.00%	-0.50%
Emerging Markets Debt Hard Currency	5.75%	12.50%	5.02%	5.25%	12.50%	4.52%	-0.50%	0.00%	-0.50%
Emerging Markets Debt Local Currency	6.75%	12.50%	6.03%	5.75%	12.50%	5.02%	-1.00%	0.00%	-1.01%
Core Real Estate	6.25%	12.50%	5.52%	6.25%	12.50%	5.52%	0.00%	0.00%	0.00%
Global REITs	6.25%	19.00%	4.59%	6.25%	19.00%	4.59%	0.00%	0.00%	0.00%
MLPs	8.50%	22.00%	6.34%	8.50%	22.00%	6.34%	0.00%	0.00%	0.00%
Diversified Hedge Funds	6.25%	9.50%	5.83%	5.75%	9.50%	5.33%	-0.50%	0.00%	-0.50%
GTAA	6.25%	10.00%	5.78%	6.00%	10.50%	5.48%	-0.25%	0.50%	-0.30%
Private Equity	10.00%	25.50%	7.16%	9.75%	25.50%	6.90%	-0.25%	0.00%	-0.26%
Commodities	5.75%	19.75%	3.95%	5.75%	19.75%	3.95%	0.00%	0.00%	0.00%
Diversified Inflation Strategies	5.25%	11.50%	4.63%	5.25%	11.50%	4.63%	0.00%	0.00%	0.00%
US Inflation	2.50%	3.00%	2.46%	2.50%	3.00%	2.46%	0.00%	0.00%	0.00%
Cash Equivalents	2.25%	3.00%	2.21%	2.50%	3.00%	2.46%	0.25%	0.00%	0.25%

RVK
Assumptions:
Summary of
Year-over-
Year
Changes

Orange highlighted cells indicate values are being calculated based on a roll up of underlying asset classes.

Global Equity is a combination of 53.7% Broad US Equity and 46.3% Broad International Equity.

Broad US Equity is a combination of 92.0% Large/Mid Cap US Equity and 8.0% Small Cap US Equity.

Broad International Equity is a combination of 66.6% Dev'd Large/Mid Cap Int'l Equity, 10.8% Dev'd Small Cap Int'l Equity, and 22.5% Emerging Markets Equity.

Diversified Inflation Strategies is a combination of 1/3 TIPS, 1/3 Global REITs, and 1/3 Commodities.

The Custom GTAA Index is comprised of 30% MSCI ACWI, 25% BB US Agg, 5% Citi Non-US WGBI UH, 10% JPM GBI EM Gbl, 10% BB US TIPS, 10% BB US HY, and 10% DJ-UBS Commodities

The Custom DIS Index is comprised of 1/3 BB US Trsry, 1/3 US TIPS Index, 1/3 MSCI World Real Estate Index, and 1/3 DJ-UBS Commodity Index.



Investment Constraint Impact

- Prior to solving for optimal asset allocations, constraints are typically reviewed and set for all asset classes
- Constraints typically reflect subjective risk tolerances of an investor, which may not be directly captured by the return, risk and correlation assumptions alone
- Constraints can (and normally do) in effect define the target allocations to most asset classes and are therefore very significant
- Minimum and Maximum Target Allocation Constraints:
 - 50/50 Equity (0-50%)
 - Intermediate Duration Fixed Income (0-40%)
 - Non-Core Fixed Income (0-40%)
 - Custom Real Return (0-10%)
 - Real Estate (0-15%)
 - Hedge Funds (0-10%)
 - Private Equity (0-5%)



Asset Allocation Methodology

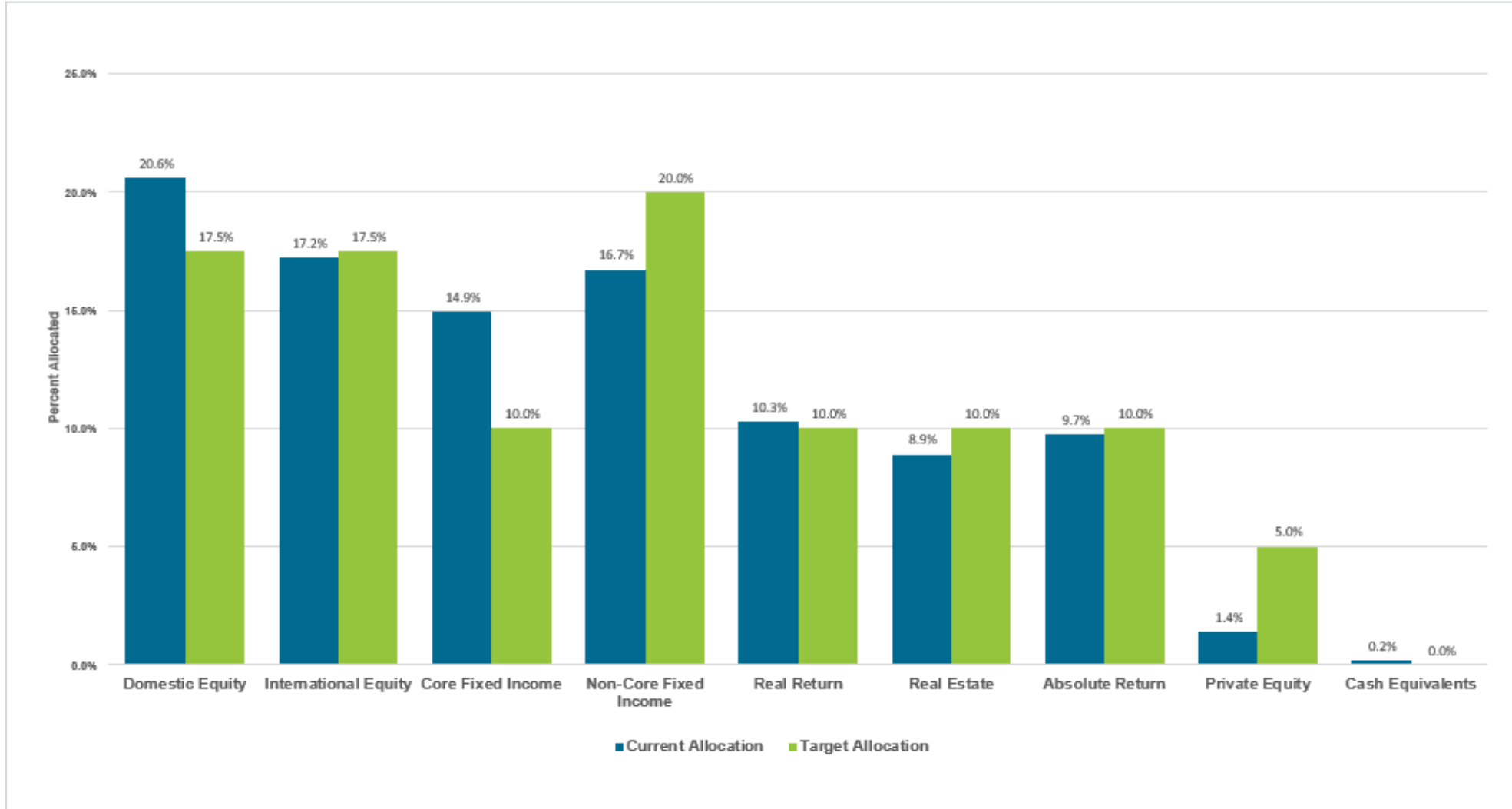
Investment Policy Statement: *Current Strategic Allocation Target and Ranges*

The Strategic Target Allocation and acceptable ranges as determined by the Board to facilitate the achievement of long-term investment objectives within acceptable risk parameters are as follows:

Asset Class	Minimum %	Strategic Target Allocation %	Maximum %
US Equity	12.5	17.5	22.5
International Equity	12.5	17.5	22.5
Core Fixed Income	5	10	15
Non-Core Fixed Income	15	20	25
Real Estate	5	10	15
Real Return	5	10	15
Absolute Return	5	10	15
Private Equity	0	5	10
Cash Equivalents	0	0	10

TMRS Investment Portfolio Asset Allocation and Performance

June 30, 2018

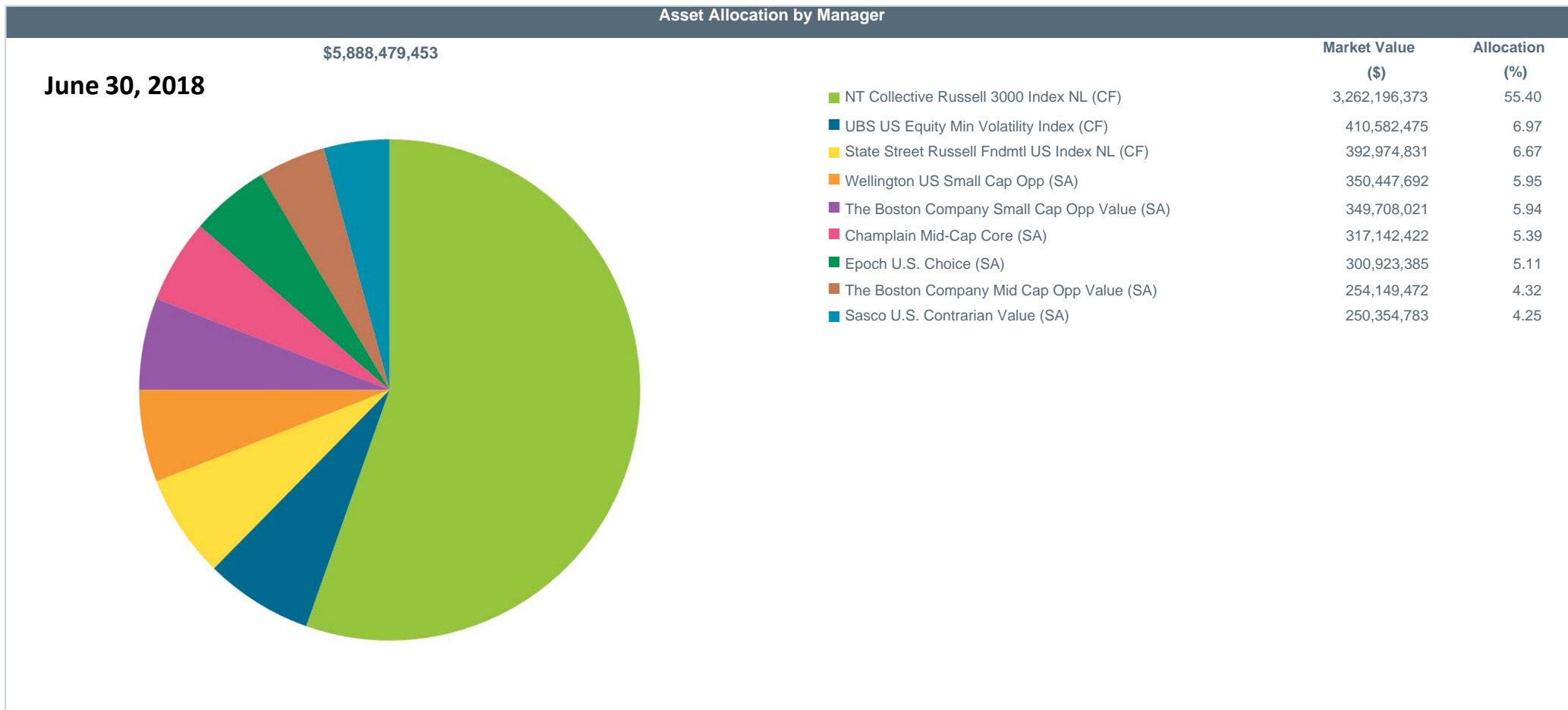
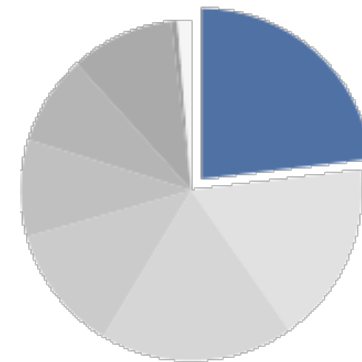


Performance shown is net of fees and provided by State Street. Performance is annualized for periods greater than one year.

	Allocation		Performance (%)									
	Market Value (\$)	%	Quarter	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	15 Years	Since Incep.	Inception Date
Total Fund	28,619,063,378	100.00	0.76	0.93	7.53	6.51	7.01	6.45	6.75	6.05	8.52	01/01/1989
Actual Allocation Benchmark			0.84	0.74	7.09	6.12	6.78	6.22	6.58	5.69	7.96	



Domestic Equity Composite Performance & Allocation



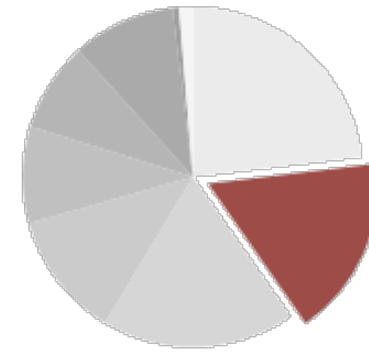
Performance shown is gross of fees. Allocations shown may not sum up to 100% exactly due to rounding. Total Domestic Equity market value excludes Citigroup Global Markets, Inc.

Comparative Performance

	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Domestic Equity	3.99	3.29	14.75	11.39	13.08	10.12	20.55	13.33	-0.32	12.61	33.20	9.13	02/01/2008
Russell 3000 Index	3.89	3.22	14.78	11.58	13.29	10.23	21.13	12.74	0.48	12.56	33.55	9.23	
Difference	0.10	0.07	-0.03	-0.19	-0.21	-0.11	-0.58	0.59	-0.80	0.05	-0.35	-0.10	



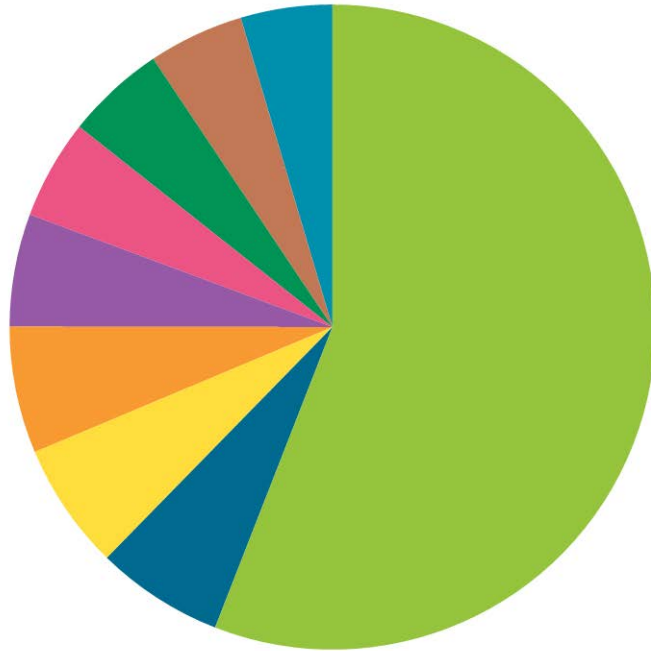
International Equity Composite Performance and Allocation



Asset Allocation by Manager

\$4,931,763,643

June 30, 2018



■ NT Daily Collective ACW Ex US IMI Non-Lending (CF)	2,757,913,742	55.92
■ Wasatch International Small Cap Growth (SA)	314,917,622	6.39
■ Wellington International Small Cap Opp (SA)	313,535,090	6.36
■ UBS World Ex US Min Volatility NL (CF)	313,335,127	6.35
■ State Street Russell RAFI Gbl Ex US Index NL (CF)	278,706,522	5.65
■ Acadian Emerging Markets (SA)	246,210,513	4.99
■ Wellington International Horizons (SA)	245,096,460	4.97
■ William Blair Emerging Markets (SA)	235,832,092	4.78
■ Lazard International Equity Plus (SA)	226,216,474	4.59

Market Value (\$)	Allocation (%)
2,757,913,742	55.92
314,917,622	6.39
313,535,090	6.36
313,335,127	6.35
278,706,522	5.65
246,210,513	4.99
245,096,460	4.97
235,832,092	4.78
226,216,474	4.59

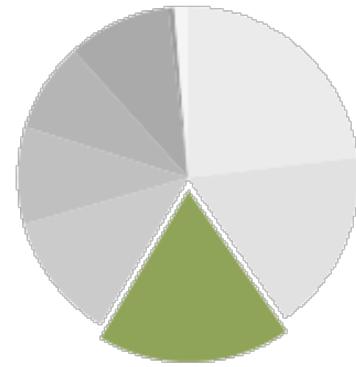
Performance shown is gross of fees. Allocations shown may not sum up to 100% exactly due to rounding.

Comparative Performance

	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
International Equity	-3.02	-2.64	9.27	6.39	7.19	2.79	29.41	3.72	-3.32	-3.11	16.31	2.52	02/01/2008
International Equity Benchmark	-2.61	-3.65	7.75	5.46	6.39	2.27	27.81	4.41	-4.60	-3.89	15.82	1.99	
Difference	-0.41	1.01	1.52	0.93	0.80	0.52	1.60	-0.69	1.28	0.78	0.49	0.53	



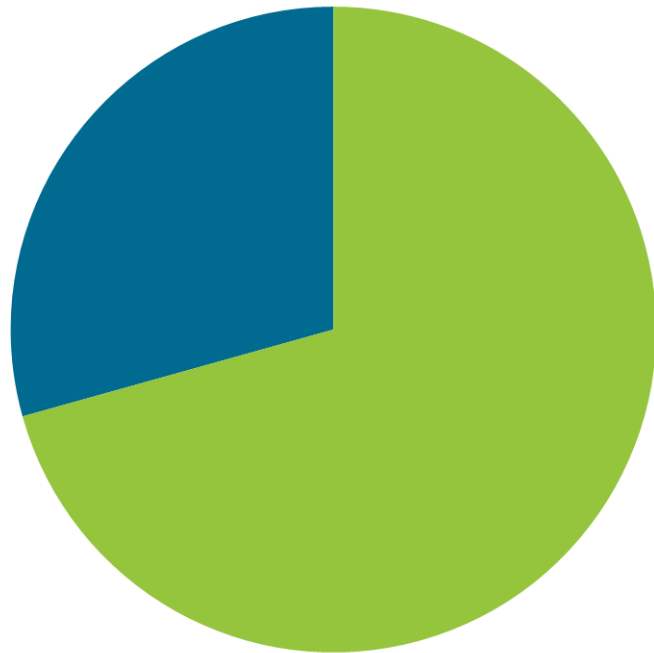
Core Fixed Income Composite Performance and Allocation



Asset Allocation by Manager

June 30, 2018

\$4,276,004,129



- BlackRock, Inc. Core (SA)
- PIMCO Core Plus Fixed Income (SA)

Market Value	Allocation
(\$)	(%)
3,021,577,767	70.66
1,254,426,363	29.34

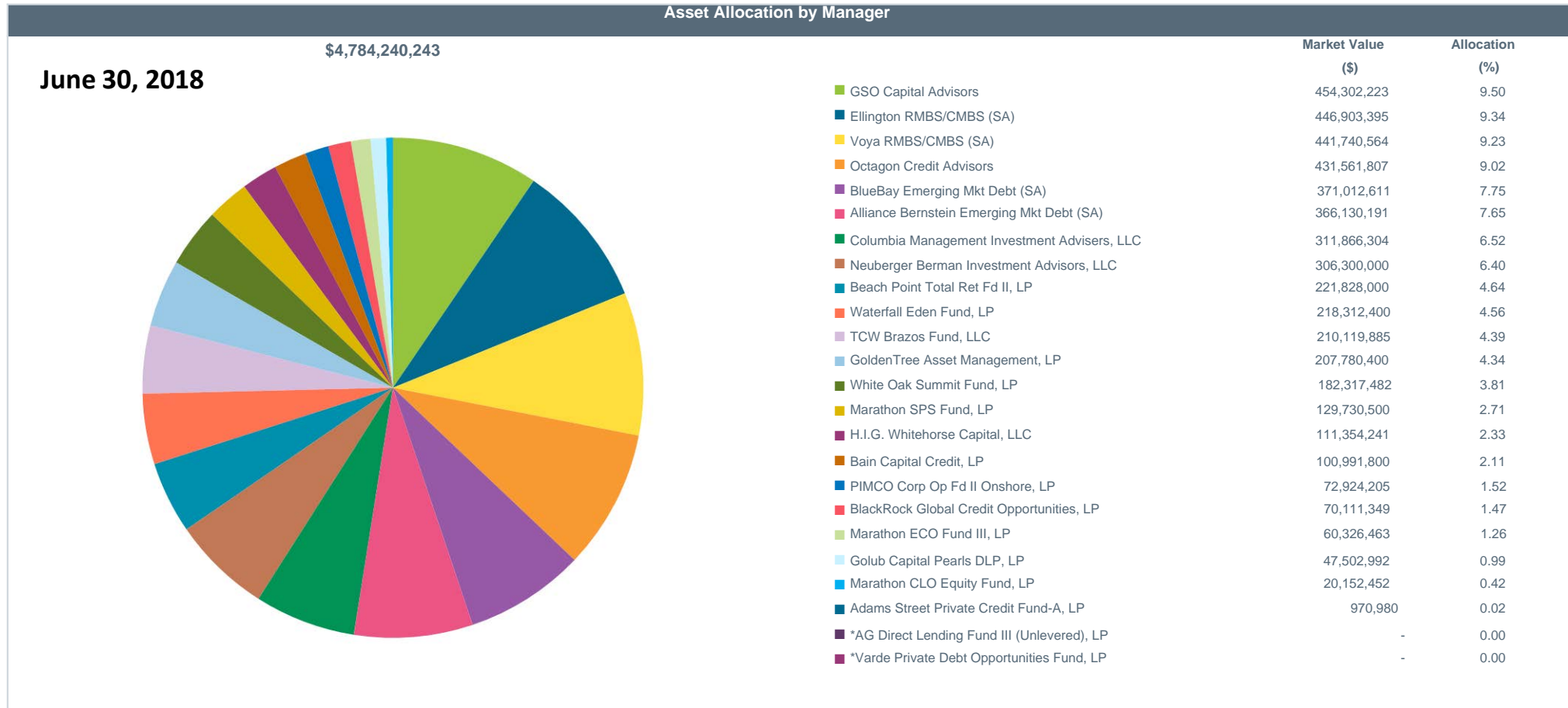
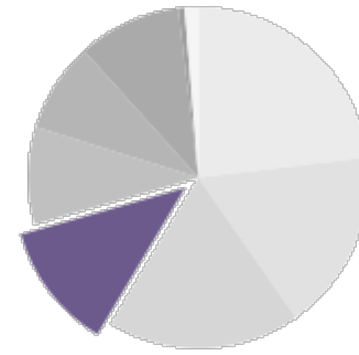
Performance shown is gross of fees. Allocations shown may not sum up to 100% exactly due to rounding.

Comparative Performance

	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Core Fixed Income	0.01	-1.41	0.02	1.98	2.48	3.83	3.93	2.98	0.80	5.77	-1.94	7.52	01/01/1989
Fixed Income Benchmark	-0.16	-1.62	-0.40	1.72	2.27	3.65	3.54	2.65	0.55	5.97	-2.02	6.95	
Difference	0.17	0.21	0.42	0.26	0.21	0.18	0.39	0.33	0.25	-0.20	0.08	0.57	



Non-Core Fixed Income Composite Performance & Allocation



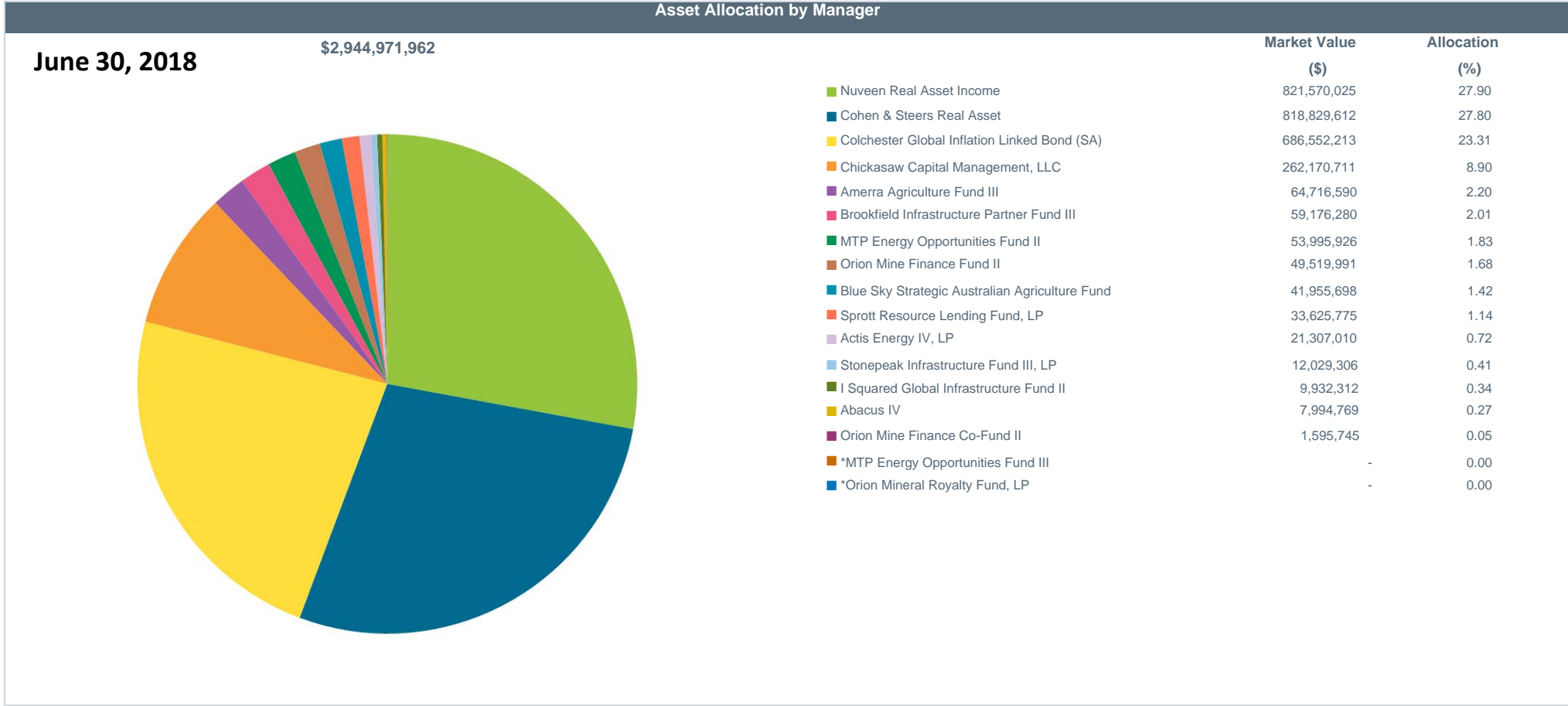
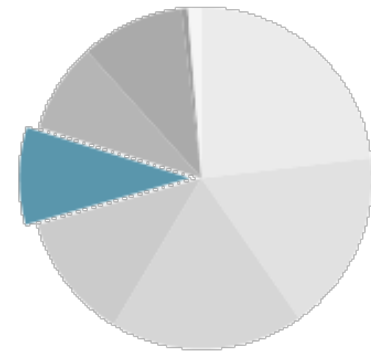
Performance shown is gross of fees. Allocations shown may not sum up to 100% exactly due to rounding.

Comparative Performance

	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Non-Core Fixed Income	0.05	1.48	4.61	5.39	N/A	N/A	8.06	7.96	1.09	N/A	N/A	5.13	10/01/2014
Non-Core Fixed Income Benchmark	0.05	1.18	3.52	3.65	N/A	N/A	5.54	7.14	-0.87	N/A	N/A	3.62	
Difference	0.00	0.30	1.09	1.74	N/A	N/A	2.52	0.82	1.96	N/A	N/A	1.51	



Real Return Composite Performance and Allocation



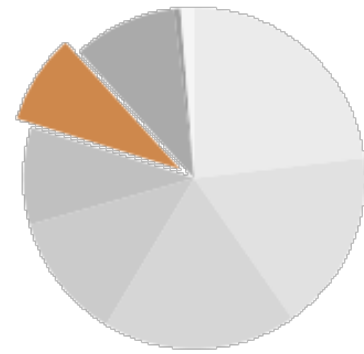
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Comparative Performance

	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Real Return	1.65	-0.16	4.82	3.51	3.15	N/A	8.32	6.99	-5.55	4.44	-4.06	3.60	02/01/2011
Real Return Benchmark	1.73	-0.07	5.16	4.42	3.76	3.03	9.91	7.51	-4.70	4.08	-4.84	3.72	
Difference	-0.08	-0.09	-0.34	-0.91	-0.61	N/A	-1.59	-0.52	-0.85	0.36	0.78	-0.12	



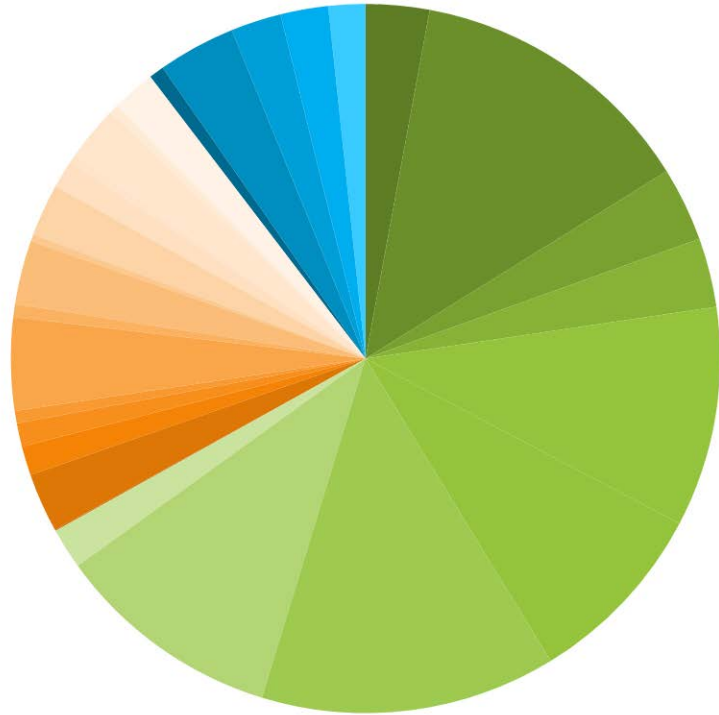
Real Estate Composite Allocation



Asset Allocation by Manager

\$2,551,160,684

June 30, 2018



	Market Value (\$)	Allocation (%)
Abacus Core Income Fund, LP	74,027,315	2.90
BlackStone Property Partners	337,699,743	13.24
H/2 CP, LP	86,153,484	3.38
H/2 CP Core RE Debt Fund, LP	80,352,975	3.15
Harrison St. Real Estate	256,060,308	10.04
INVESCO Advisers, Inc.	218,175,872	8.55
Stockbridge Smart Markets Fund, LP	343,513,620	13.46
USAA Eagle Real Estate Fund, LP	263,839,635	10.34
Walton St Real Estate Debt Fund	47,524,816	1.86
Abacus Multi-Family Partners II, LP	1,228,659	0.05
Abacus Multi-Family Partners III, LP	68,873,208	2.70
Alcion RE Part Fund III-B, LP	33,916,965	1.33
DivcoWest V	27,333,097	1.07
Greenfield Acquisition Partners VI, LP	14,356,758	0.56
Greenfield Acquisition Partners VII, LP	108,038,724	4.23
IC Berkeley Partners IV, LP	15,061,928	0.59
Madison Realty Capital Debt Fund IV, LP	74,476,274	2.92
Miller Global Fund VII	7,961,980	0.31
Rubenstein Properties Fund II	60,780,427	2.38
Rubenstein Properties Fund III	32,447,366	1.27
Stockbridge Value Fund, LLC	10,285,310	0.40
Stockbridge Value Fund II, LP	63,508,383	2.49
Stockbridge Value Fund III, LP	9,989,207	0.39
Torchlight Debt Opp Fund V, LP	50,831,235	1.99
*Torchlight Debt Opp Fund VI, LP	-	0.00
European Property Inv Special	17,436,207	0.68
*Kildare European Partners II	-	0.00
Lubert-Adler Fund VII	90,350,134	3.54
Moorfield Real Estate III	58,590,141	2.30
TPG Real Estate Part II, LP	55,462,155	2.17
*TPG Real Estate Partners III, LP	-	0.00
*Tristan European Property Inv Sp Opp 5 SCSP	-	0.00
Walton St Real Estate Fund VII	42,884,757	1.68

Performance shown is gross of fees. Allocations shown may not sum up to 100% exactly due to rounding. *Represents approved investments that have not been funded and/or are pending legal documents.

Comparative Performance

	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Real Estate	2.35	5.00	10.86	14.12	14.29	N/A	11.93	14.76	15.25	20.35	11.69	13.14	01/01/2012
Real Estate Benchmark	2.19	4.31	8.08	9.95	11.42	5.11	7.65	9.97	15.00	12.40	13.04	11.37	
Difference	0.16	0.69	2.78	4.17	2.87	N/A	4.28	4.79	0.25	7.95	-1.35	1.77	

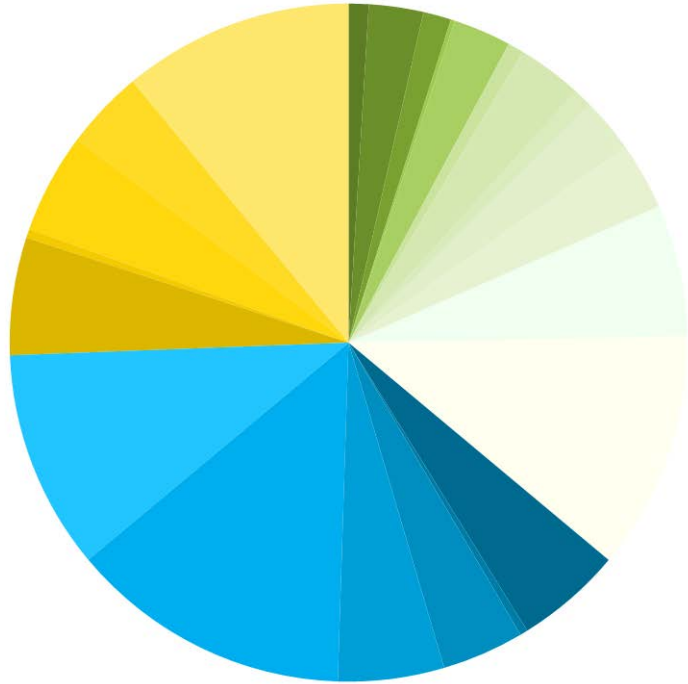


Private Equity Performance and Allocation

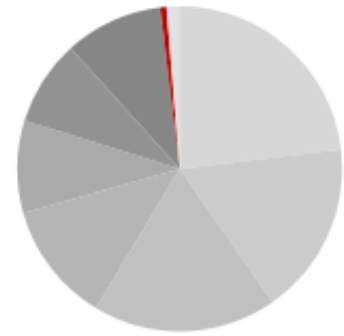
Asset Allocation by Manager

\$404,064,523

June 30, 2018



	Market Value (\$)	Allocation (%)
Altaris Constellation Partners IV, LP	3,851,071	0.95
Altaris Health Partners IV, LP	10,518,566	2.60
Capital Partners Private Equity Income Fund III, LP	5,375,858	1.33
*CapVest Equity Partners IV SCSp	-	0.00
*Dunes Point Capital Fund II, LP	-	0.00
GTCR Fund XII, LP	799,164	0.20
Harvest Partners VII	11,127,339	2.75
*H.I.G. Strategic Partners Fund	-	0.00
Incline Equity IV	3,086,035	0.76
Kainos Capital Partners II	12,512,449	3.10
Marlin Heritage II, LP	3,757,105	0.93
Marlin Equity V, LP	10,420,021	2.58
One Rock Capital Partners II, LP	12,971,153	3.21
*Providence Equity Partners VIII, LP	-	0.00
Searchlight Capital II	25,359,143	6.28
Tritium I, LP	45,989,518	11.38
Foundry Group Next Fund, LP	20,562,729	5.09
Foundry Group Next 2018, LP	1,462,500	0.36
FTV V	15,842,030	3.92
Mercato Partners Growth III, LP	20,447,548	5.06
Providence Strategic Growth II	54,297,952	13.44
*Providence Strategic Growth III, LP	-	0.00
Update Partners V, LP	42,256,203	10.46
Carlyle Energy Mezzanine Fund II	22,665,119	5.61
GSO COF III Co-investment Fund, LP	1,693,491	0.42
GSO Capital Opportunities Fund III, LP	19,385,543	4.80
H.I.G. Bayside Fund IV	15,245,253	3.77
*LightBay Investment Partners, LP	-	0.00
*TPG Opportunities Partners IV, LP	-	0.00
TSSP Adjacent Opportunities Fund III	44,438,733	11.00
*TSSP Adjacent Opportunities (D), LP	-	0.00



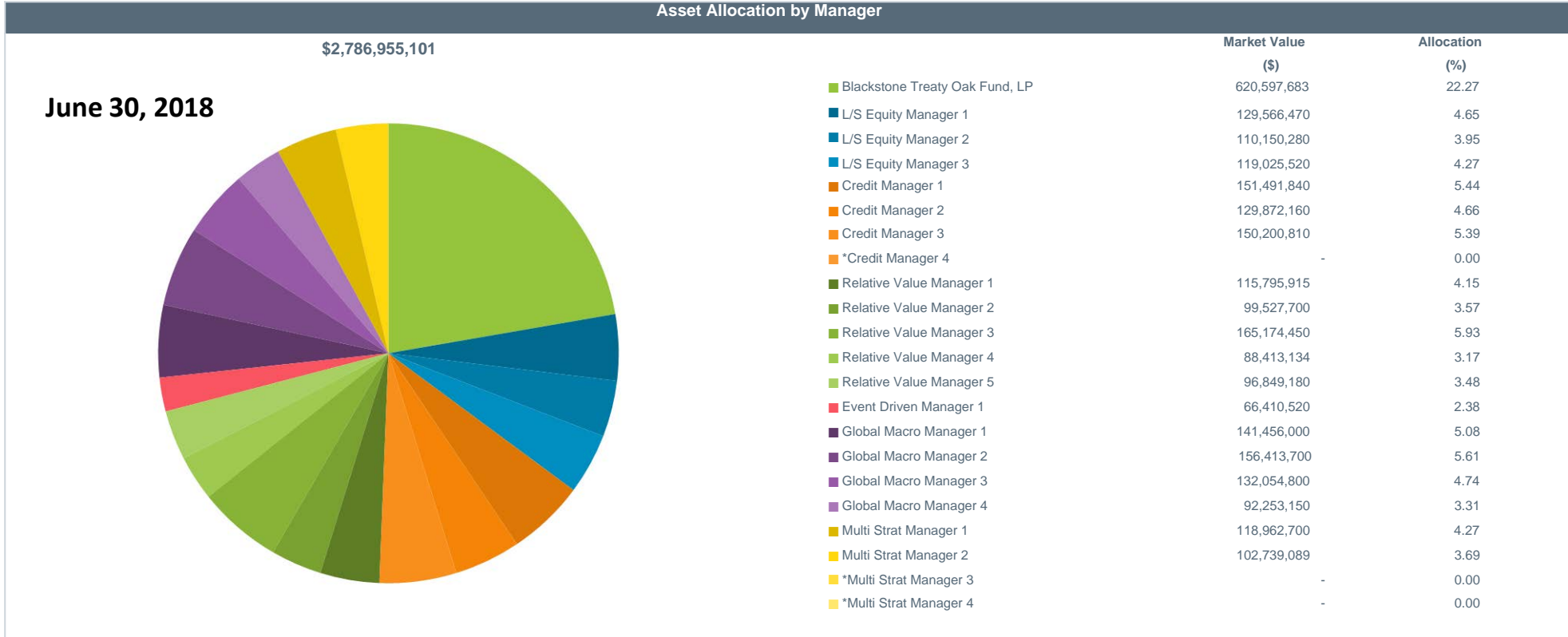
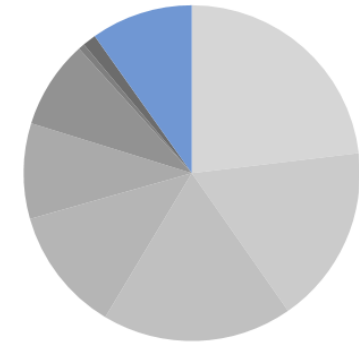
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Comparative Performance

	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Private Equity	10.33	23.31	35.00	N/A	N/A	N/A	19.69	1.68	N/A	N/A	N/A	17.02	12/01/2015
Private Equity - Buy Out	6.92	21.51	25.61	N/A	N/A	N/A	7.09	23.91	N/A	N/A	N/A	21.06	01/01/2016
Private Equity - Venture/Growth	16.83	30.15	57.42	N/A	N/A	N/A	34.71	N/A	N/A	N/A	N/A	22.24	07/01/2016
Private Equity - Special Situations	2.52	9.80	12.13	N/A	N/A	N/A	12.52	N/A	N/A	N/A	N/A	9.42	03/01/2016



Absolute Return Performance and Allocation



Performance shown is gross of fees. Allocations shown may not sum up to 100% exactly due to rounding. *Represents approved investments that have not been funded and/or are pending legal documents.

Comparative Performance

	1 Quarter	Year To Date	1 Year	3 Years	5 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Absolute Return	0.97	2.39	7.09	5.21	N/A	N/A	11.35	2.97	3.39	N/A	N/A	5.30	08/01/2014
Absolute Return Benchmark	0.43	1.90	5.26	1.48	3.10	1.39	7.11	-1.34	0.79	4.72	8.61	2.40	
Difference	0.54	0.49	1.83	3.73	N/A	N/A	4.24	4.31	2.60	N/A	N/A	2.90	
Blackstone Treaty Oak Fund, LP	1.70	2.59	6.03	3.88	N/A	N/A	6.91	3.04	3.39	N/A	N/A	4.28	08/01/2014
Absolute Return Benchmark	0.43	1.90	5.26	1.48	3.10	1.39	7.11	-1.34	0.79	4.72	8.61	2.40	
Difference	1.27	0.69	0.77	2.40	N/A	N/A	-0.20	4.38	2.60	N/A	N/A	1.88	
Absolute Return Direct Composite	0.76	2.33	7.39	N/A	N/A	N/A	13.21	2.65	N/A	N/A	N/A	7.18	01/01/2016
Absolute Return Benchmark	0.43	1.90	5.26	1.48	3.10	1.39	7.11	-1.34	0.79	4.72	8.61	3.00	
Difference	0.33	0.43	2.13	N/A	N/A	N/A	6.10	3.99	N/A	N/A	N/A	4.18	



Other Important Notes

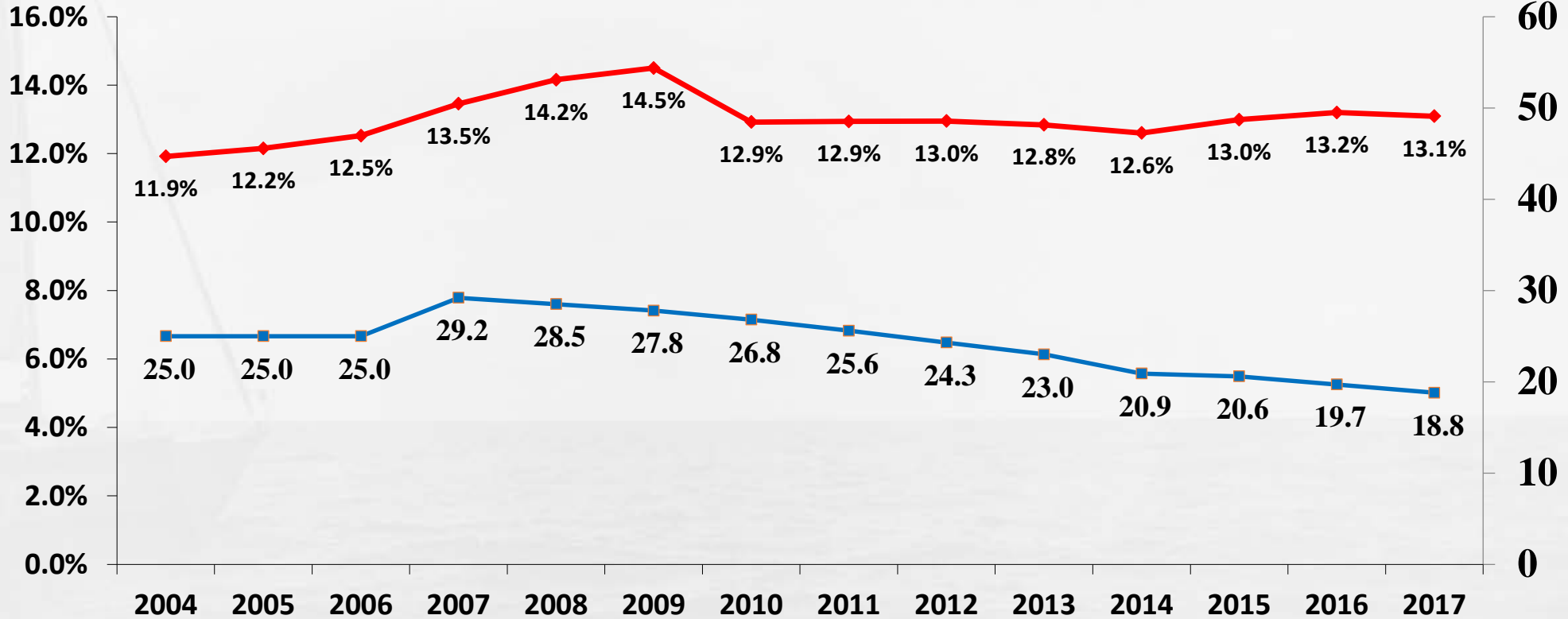
- Compliance
- Risk
- Audit
 - Internal
 - External



Actuarial Overview – Funding the Benefit



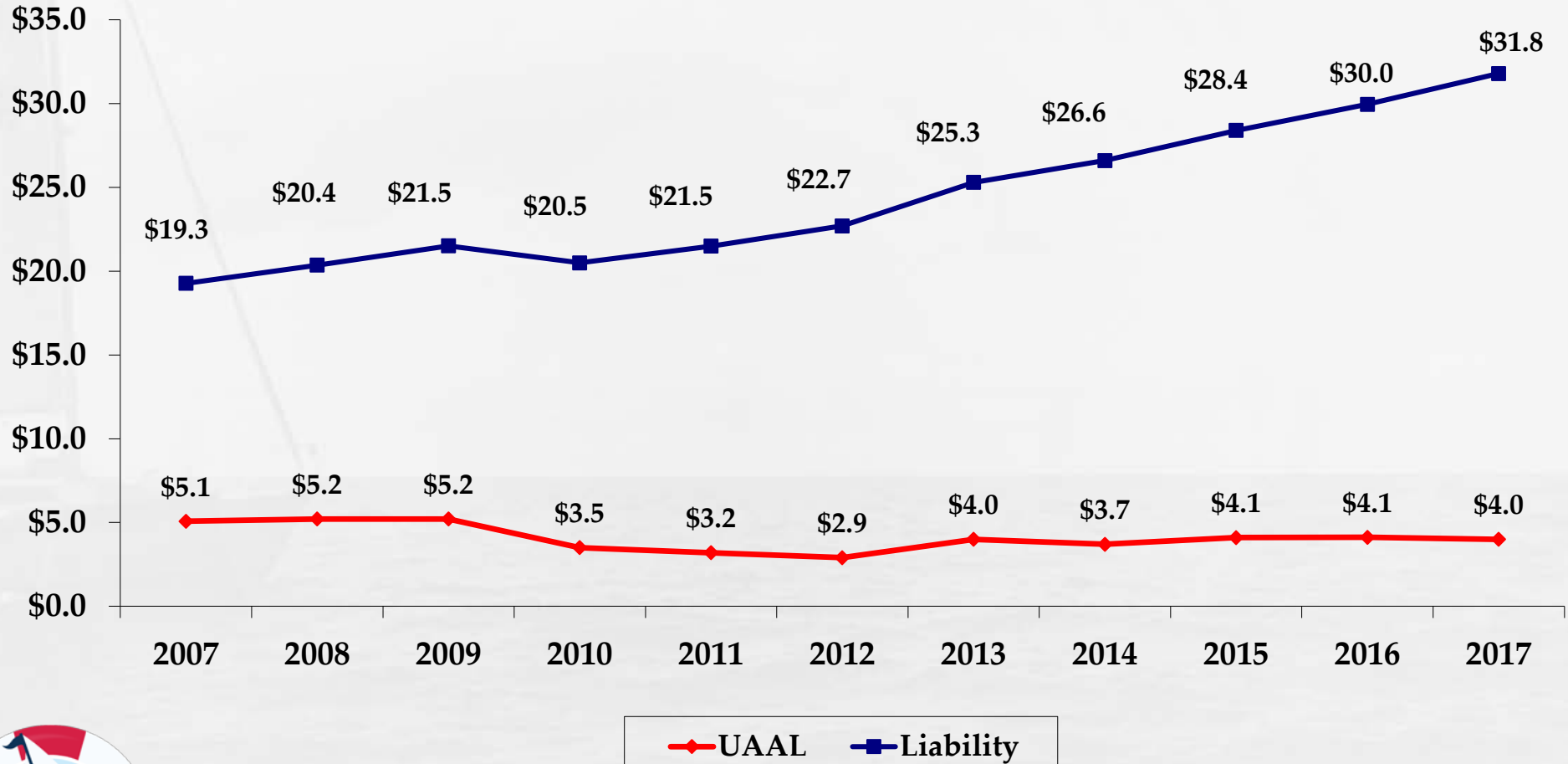
Historical Dollar-Weighted Contribution Rates for TMRS



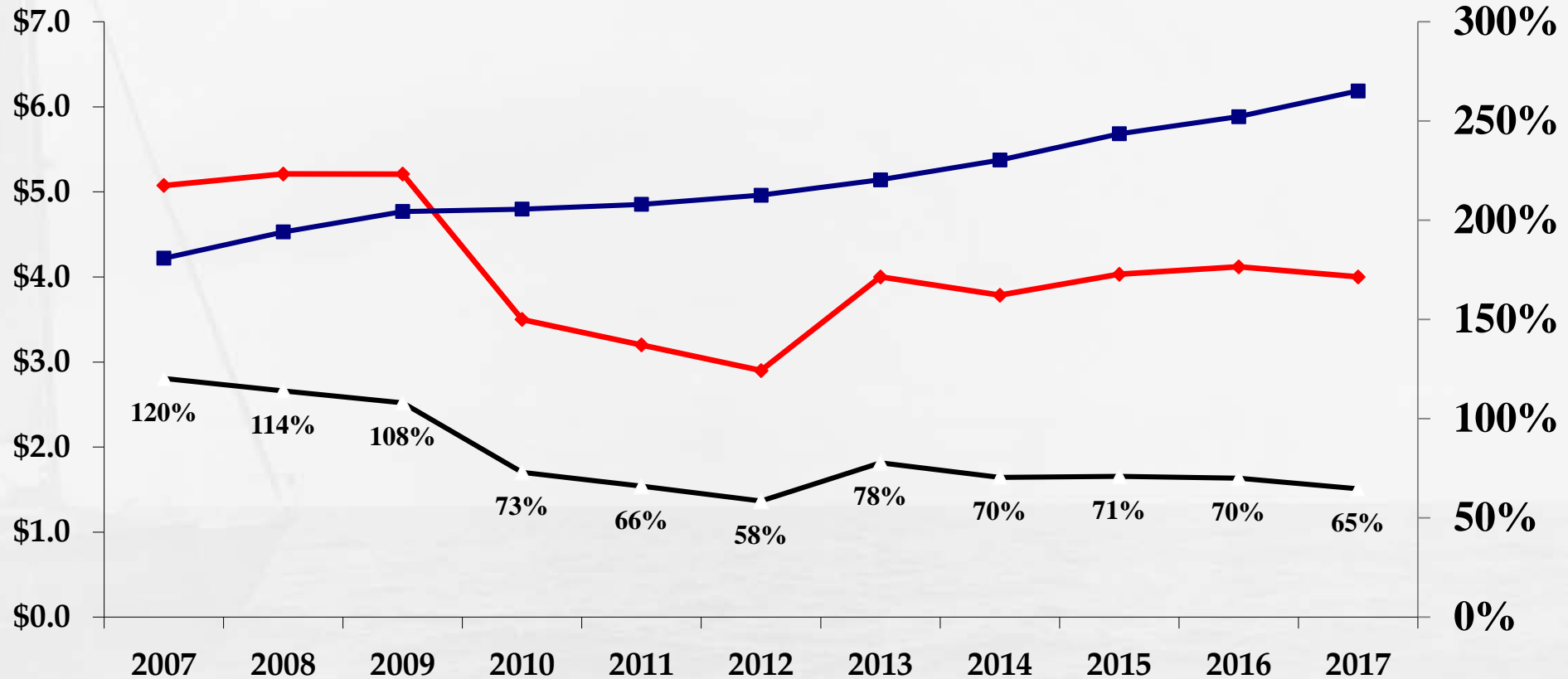
◆ Contribution Rate
 ■ Single Equiv Period (Years)



Relative Size of UAAL to AAL



Relative Size of UAAL to Payroll

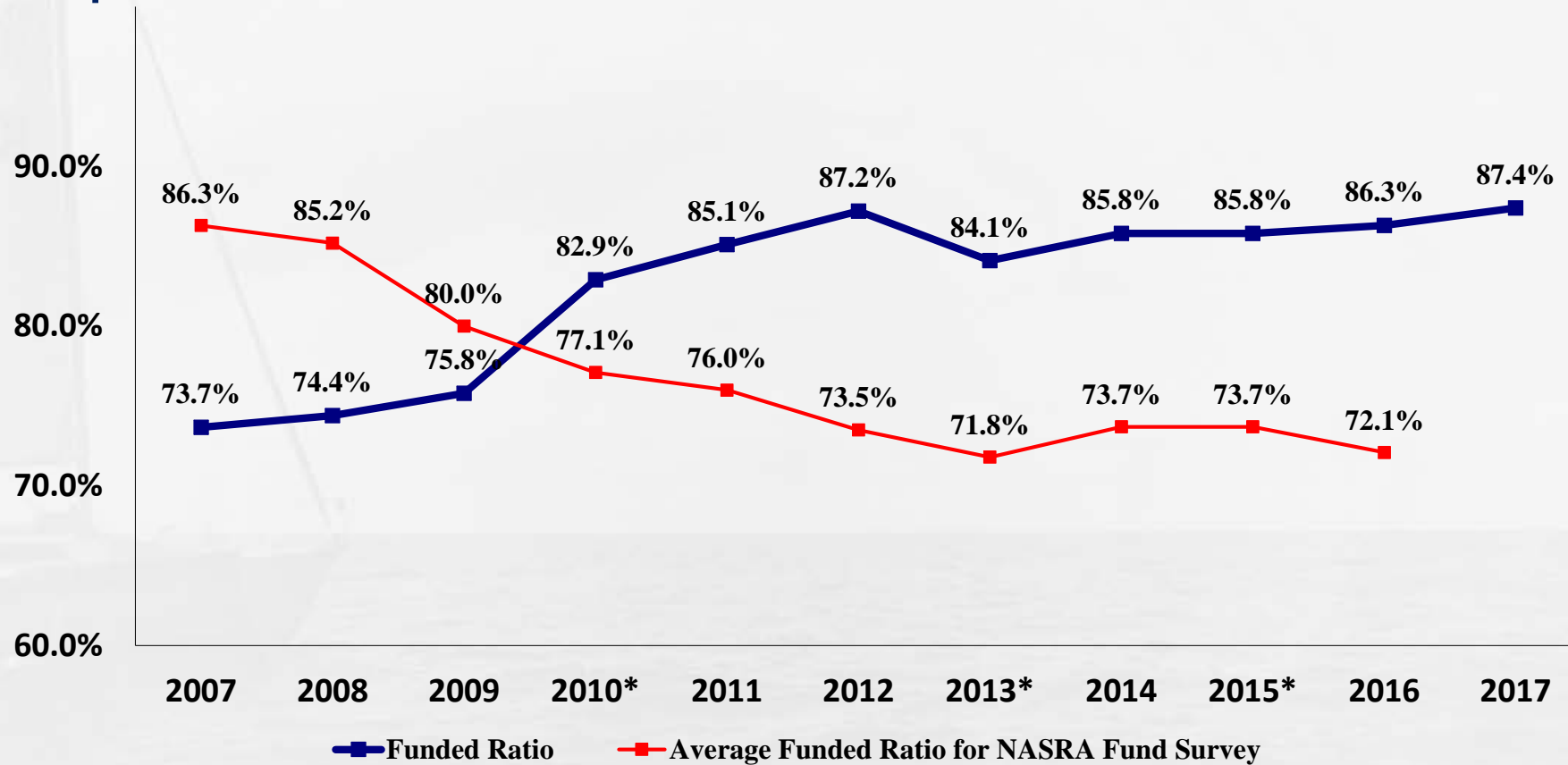


◆ UAAL
 ■ Payroll
 - - UAAL/Payroll



Funded Ratio Percentages:

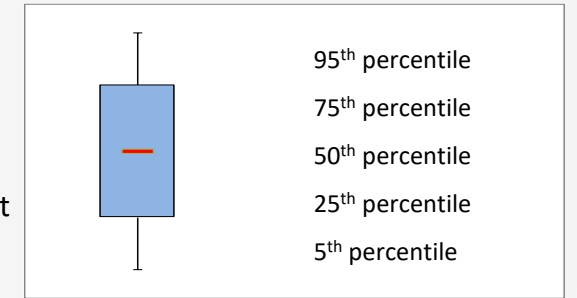
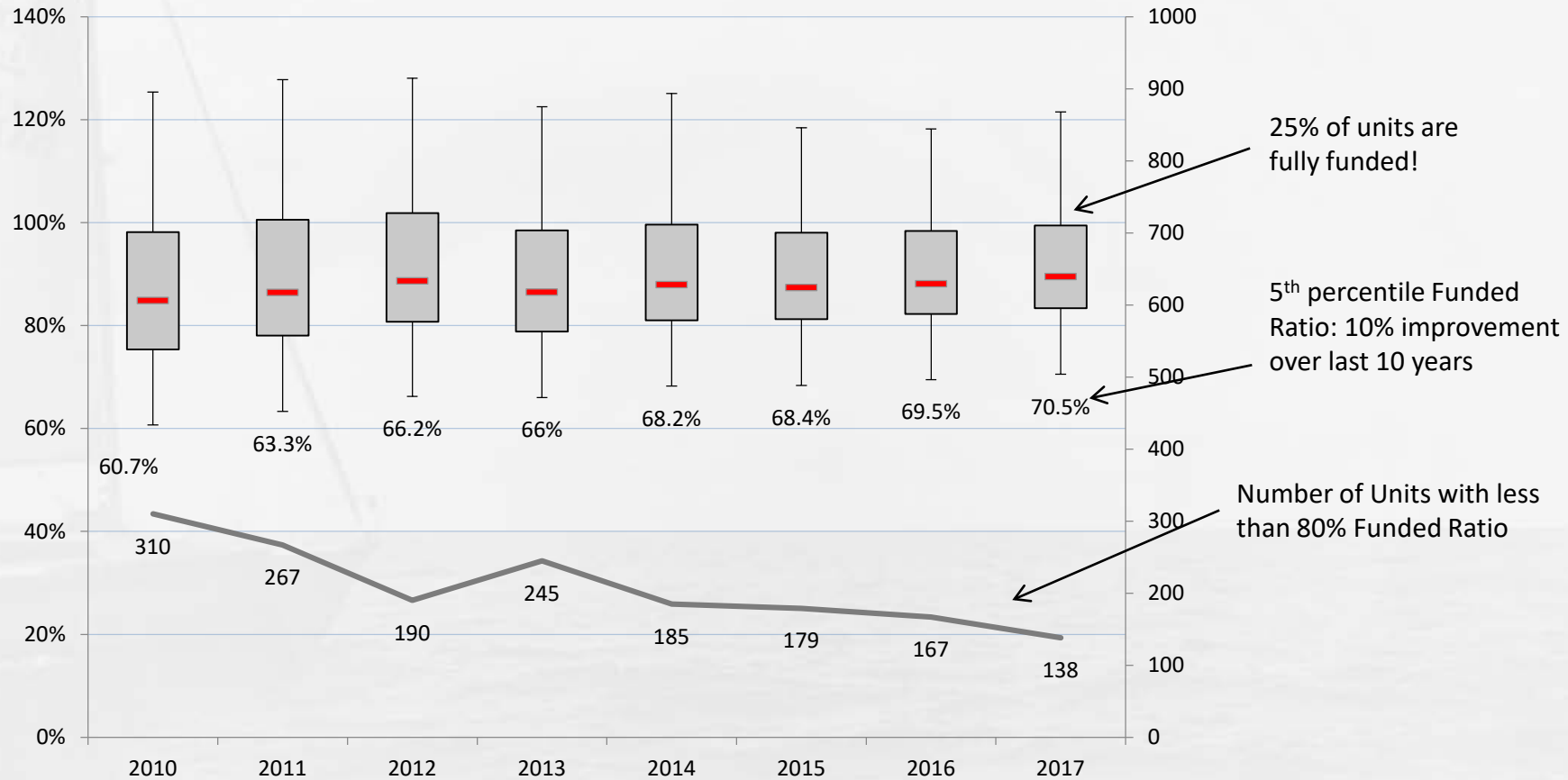
Compared to TMRS' Peers



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



Distribution of Funded Ratio Percentages



The percentile represents the proportion of employers below the point. For example, the 75th percentile is 99%, meaning that 75% of cities have a funded ratio less than 99%. Conversely, 25% of the cities have a funded ratio of 99% or greater.

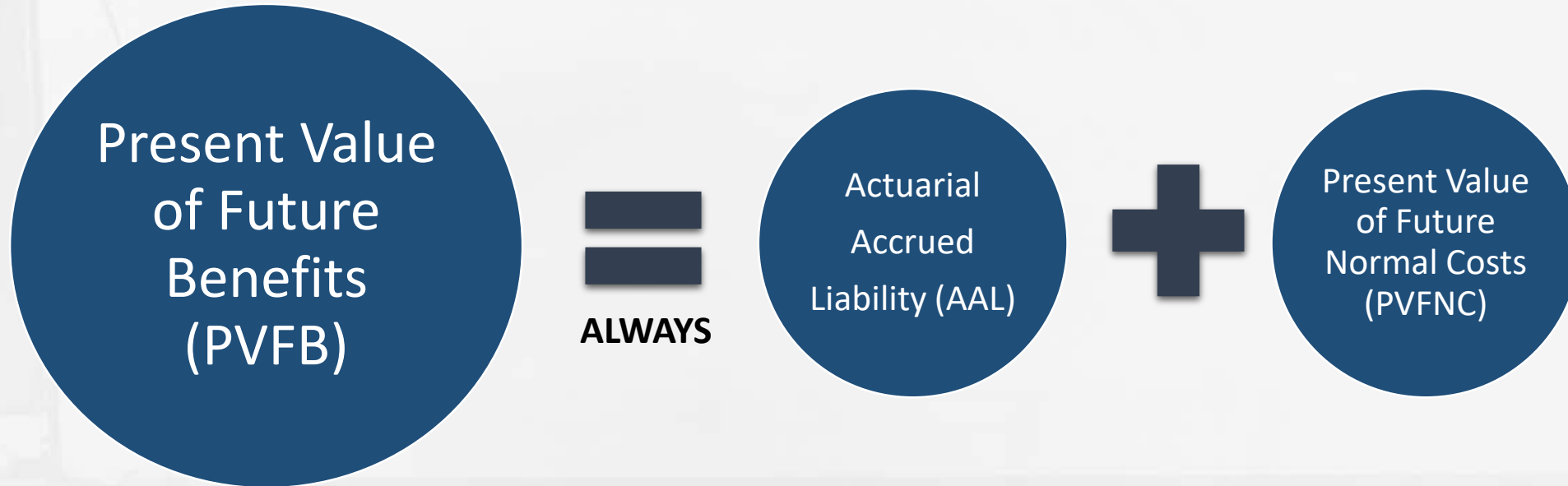


Funding Summary

- Overall System-wide “health” continues to improve
 - Overall funded levels continue to improve
 - Contribution rates have remained relatively stable
- With no changes in assumptions, the expectation is for an increasing funded ratio over the next few valuations and continued stability in the contribution rates, System-wide



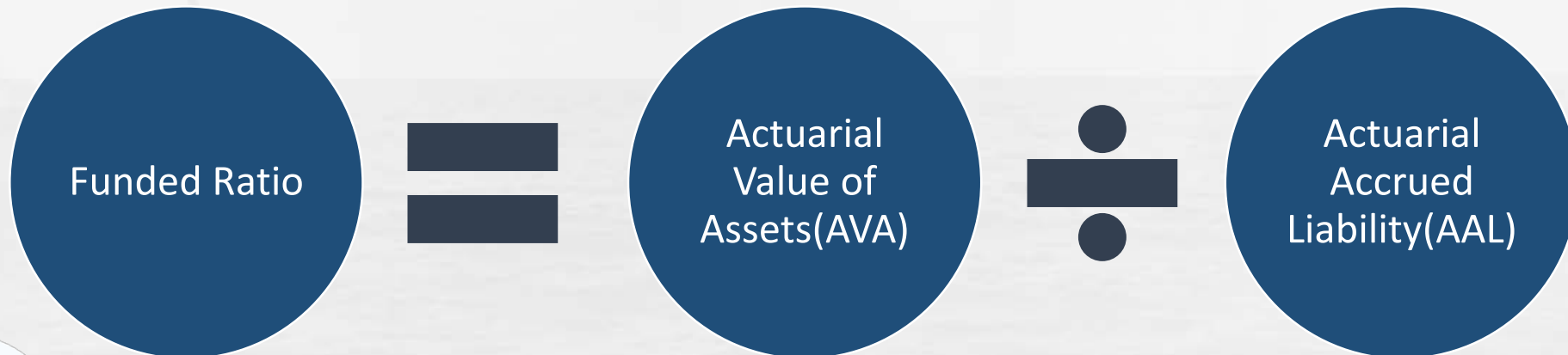
Benefits



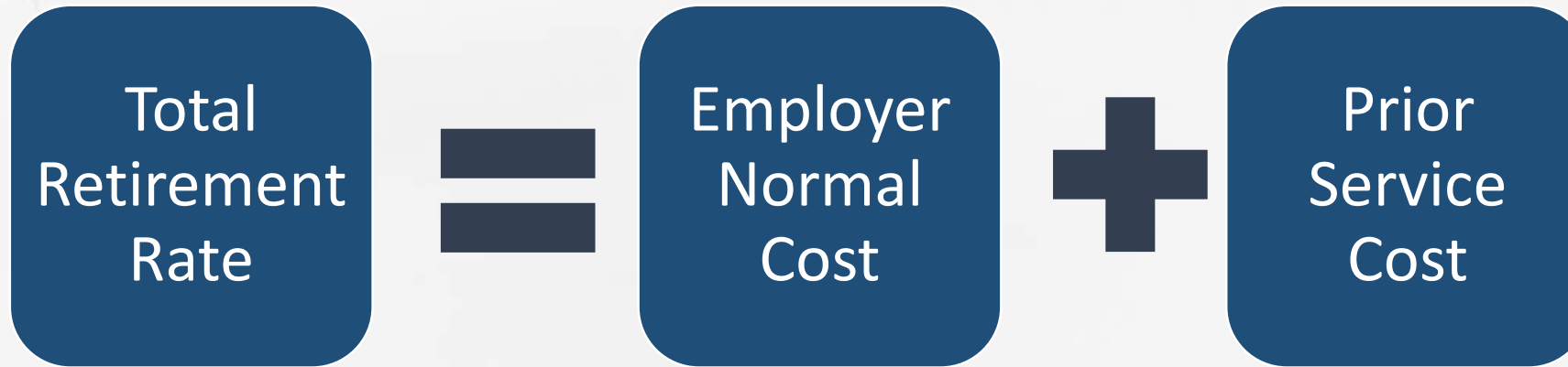
- AAL is the value of the benefits accrued from past years of service
- Normal Cost is the value of the benefits accruing during the current year
- PVFNC is the value of the benefits accruing during the current and all future years of service (includes the Normal Cost)



Unfunded Actuarial Accrued Liability & Funded Ratio



Contributions



- Normal cost contribution rate is the value of benefits accruing during the current year expressed as a percentage of payroll
- Prior service contribution rate is the level percentage of payroll required to amortize the unfunded actuarial liability over the specified amortization period



Rate Stabilization Techniques

- Contribution Rate stabilization is a long-term strategic goal of the TMRS Board of Trustees. Over the past several years, the Board has approved many actuarial changes to meet that goal.
- Rate stabilization at the System level is fully optimized under the current funding policy.
- Further rate stabilization must be done at the city level.
- The TMRS Act and a Board Rule allow any TMRS city to make additional contributions above the required contribution rate, on a voluntary basis, to its TMRS Benefit Accumulation Fund (BAF) account.



What Can Cities Do?



- The most effective way for a city to stabilize its TMRS contribution rate is to determine, during the budget process, an affordable contribution rate that exceeds the required calculated contribution rate and continue to pay monthly at this level from year to year, even when the calculated contribution rate goes down.
- A city can also make lump sum payments, but it is less effective from a rate stabilization perspective.



Advantages Beyond Rate Stabilization

Making additional contributions will:

- Directly reduce the Unfunded Actuarial Accrued Liability (UAAL) dollar for dollar
- Reduce the years needed to attain a 100% funded status (i.e., to pay off the UAAL)
- Produce cost savings over the long run
- Provide a contribution rate cushion for future adverse plan experience
- In most cases, reduce the required contribution rate for future years



Rate Letter Information

Amortization Bases and Payments

Year Established	Description	Years Remaining	Base	Payment
2013	2013 Valuation (Fresh Start)	23	\$12,257,462	\$793,353
2014	2014 Experience	23	(1,476,019)	(95,534)
2015	2015 Experience	28	239,225	13,723
2015	2015 Actuarial Changes	28	878,611	50,401
2016	2016 Experience	24	398,205	25,083
2017	2017 Experience	23	<u>(596,987)</u>	<u>(38,639)</u>
	Total		11,700,497	748,387



For Rate Letter questions, see TMRS Staff in the City Information Cove

Sample City - UAAL Amortization as of 12/31/2017

2019 Retirement Rate = 14.10% (Normal Cost = 10.30%; Prior Service Cost = 3.80%)

Description	2013 Valuation/ 2014 Experience/ 2017 Experience	2015 Actuarial Changes/ Experience	2016 Experience	2017 Total UAAL
Years Left	23	28	24	
UAAL Balance	10,184,456	1,117,836	398,205	11,700,497

<u>Payment Stream</u>				<u>Total Payment</u>	<u>UAAL Balance (BOY)</u>	<u>Valuation Payroll</u>	<u>Prior Service Rate</u>	<u>Retirement Rate</u>
1	659,180	64,124	25,083	748,387	11,700,497	19,709,545	3.80%	14.10%
2	678,955	66,048	25,835	770,839	11,716,910	20,300,831	3.80%	14.10%
3	699,324	68,029	26,611	793,964	11,711,231	20,909,856	3.80%	14.10%
4	720,304	70,070	27,409	817,783	11,681,270	21,537,152	3.80%	14.10%
5	741,913	72,172	28,231	842,316	11,624,674	22,183,267	3.80%	14.10%
6	764,170	74,337	29,078	867,586	11,538,904	22,848,765	3.80%	14.10%
7	787,095	76,567	29,950	893,613	11,421,233	23,534,228	3.80%	14.10%
8	810,708	78,864	30,849	920,422	11,268,721	24,240,255	3.80%	14.10%
9	835,030	81,230	31,774	948,034	11,078,212	24,967,463	3.80%	14.10%
10	860,080	83,667	32,728	976,475	10,846,310	25,716,487	3.80%	14.10%
11	885,883	86,177	33,709	1,005,770	10,569,363	26,487,982	3.80%	14.10%
12	912,459	88,763	34,721	1,035,943	10,243,450	27,282,621	3.80%	14.10%
13	939,833	91,425	35,762	1,067,021	9,864,358	28,101,100	3.80%	14.10%
14	968,028	94,168	36,835	1,099,032	9,427,561	28,944,133	3.80%	14.10%
15	997,069	96,993	37,940	1,132,002	8,928,202	29,812,457	3.80%	14.10%
16	1,026,981	99,903	39,078	1,165,963	8,361,063	30,706,831	3.80%	14.10%
17	1,057,790	102,900	40,251	1,200,941	7,720,550	31,628,036	3.80%	14.10%
18	1,089,524	105,987	41,458	1,236,970	7,000,655	32,576,877	3.80%	14.10%
19	1,122,210	109,167	42,702	1,274,079	6,194,936	33,554,183	3.80%	14.10%
20	1,155,876	112,442	43,983	1,312,301	5,296,484	34,560,808	3.80%	14.10%
21	1,190,552	115,815	45,303	1,351,670	4,297,887	35,597,632	3.80%	14.10%
22	1,226,269	119,290	46,662	1,392,220	3,191,202	36,665,561	3.80%	14.10%
23	1,263,057	122,868	48,062	1,433,987	1,967,912	37,765,528	3.80%	14.10%
24	-	126,554	49,503	176,058	618,889	38,898,494	0.45%	10.75%
25	-	130,351	-	130,351	478,729	40,065,449	0.33%	10.63%
26	-	134,261	-	134,261	376,341	41,267,412	0.33%	10.63%
27	-	138,289	-	138,289	263,000	42,505,434	0.33%	10.63%
28	-	142,438	-	142,438	137,847	43,780,597	0.33%	10.63%
29	-	-	-	-	-	45,094,015	0.00%	10.30%
Total Payment	21,392,292	2,752,902	863,519	25,008,714				



Sample City - UAAL Amortization as of 12/31/2017

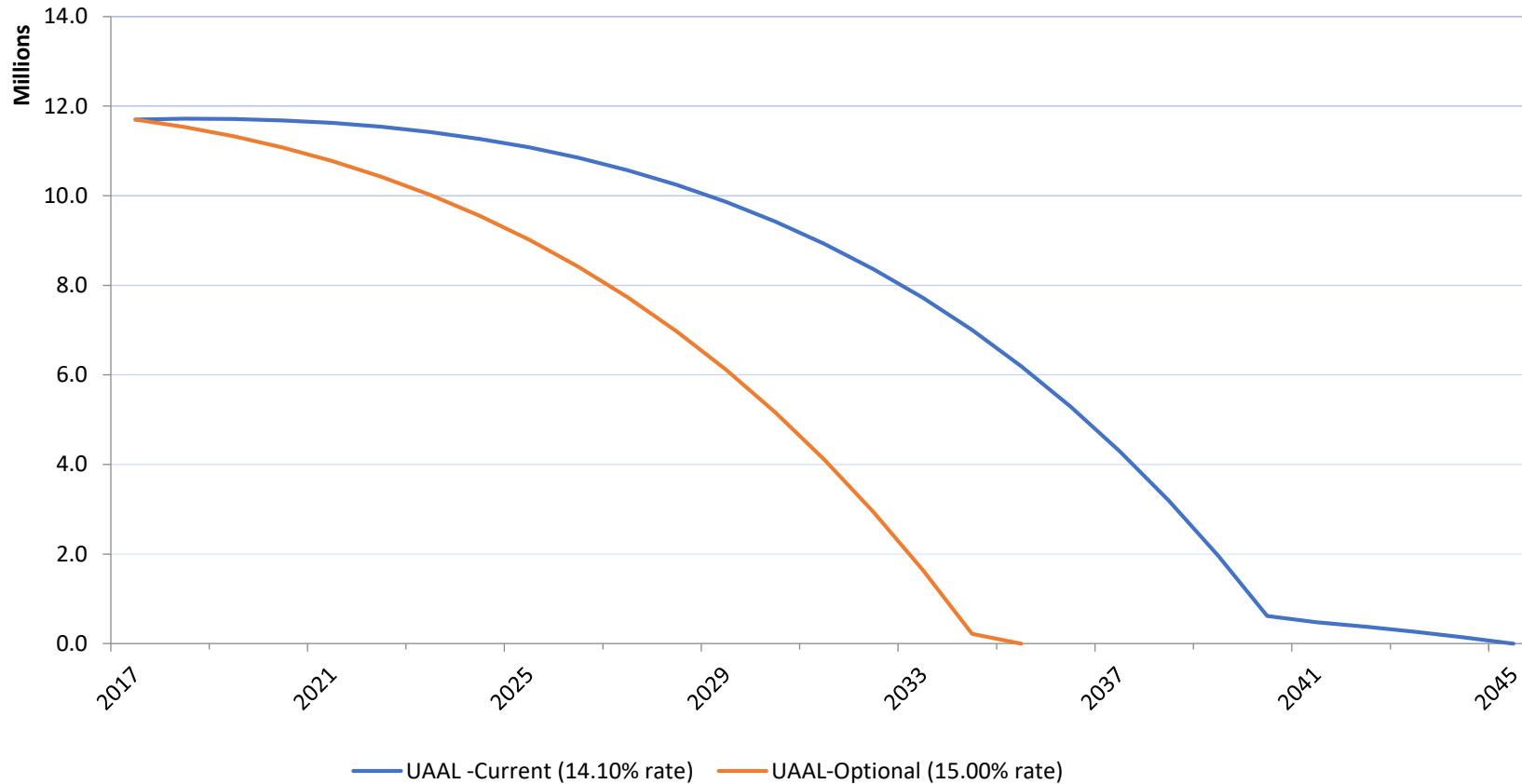
2019 Retirement Rate = 15.00% (Normal Cost = 10.30%; Prior Service Cost = 4.70%)

Description	2013 Valuation/ 2014 Experience/ 2017 Experience	2015 Actuarial Changes/ Experience	2016 Experience	2017 Total UAAL
Years Left	23	28	24	
UAAL Balance	10,184,456	1,117,836	398,205	11,700,497

<u>Payment Stream</u>				<u>Additional</u>		<u>UAAL Balance (BOY)</u>	<u>Val Payroll</u>	<u>Prior Service Rate</u>	<u>Retirement Rate</u>
				<u>Prior Service Payment</u>	<u>Total Prior Service Payment</u>				
1	659,180	64,124	25,083	177,962	926,349	11,700,497	19,709,545	4.70%	15.00%
2	678,955	66,048	25,835	183,300	954,139	11,533,008	20,300,831	4.70%	15.00%
3	699,324	68,029	26,611	188,799	982,763	11,325,495	20,909,856	4.70%	15.00%
4	720,304	70,070	27,409	194,463	1,012,246	11,074,396	21,537,152	4.70%	15.00%
5	741,913	72,172	28,231	200,297	1,042,614	10,775,880	22,183,267	4.70%	15.00%
6	764,170	74,337	29,078	206,306	1,073,892	10,425,833	22,848,765	4.70%	15.00%
7	787,095	76,567	29,950	212,495	1,106,109	10,019,836	23,534,227	4.70%	15.00%
8	810,708	78,864	30,849	218,870	1,139,292	9,553,141	24,240,254	4.70%	15.00%
9	835,030	81,230	31,774	225,436	1,173,471	9,020,654	24,967,462	4.70%	15.00%
10	860,080	83,667	32,728	232,200	1,208,675	8,416,904	25,716,486	4.70%	15.00%
11	885,883	86,177	33,709	239,166	1,244,935	7,736,021	26,487,980	4.70%	15.00%
12	912,459	88,763	34,721	246,340	1,282,283	6,971,708	27,282,620	4.70%	15.00%
13	939,833	91,425	35,762	253,731	1,320,752	6,117,209	28,101,098	4.70%	15.00%
14	968,028	94,168	36,835	261,343	1,360,374	5,165,279	28,944,131	4.70%	15.00%
15	997,069	96,993	37,940	269,183	1,401,185	4,108,149	29,812,455	4.70%	15.00%
16	1,026,981	99,903	39,078	277,258	1,443,221	2,937,488	30,706,829	4.70%	15.00%
17	1,057,790	102,900	40,251	285,576	1,486,518	1,644,369	31,628,034	4.70%	15.00%
18	1,089,524	105,987	41,458	294,143	1,531,113	219,223	32,576,875	4.70%	15.00%
19						-	33,554,181	0.00%	10.30%
Total Payment	15,434,328	1,501,427	587,304	4,166,871	21,689,930				



UAAL Amortization for a Sample City



Assumes all actuarial assumptions are exactly met each year

The City's calculated contribution rate is 14.10%.

By paying an additional 0.90% (15% total), the City can pay off the UAAL 10 years sooner and save approximately \$3.3M. This also allows the City a stable contribution rate for budgeting and builds a cushion for future adverse experience.



What If My City Is Already Overfunded?

- Congratulations! Now let's keep you there.
- As a reminder, your Normal Cost is the cost of current year's accruals for active employees. Under the EAN funding method, the Normal Cost is generally stable.
- If cities have an Overfunded Actuarial Accrued Liability (OAAL, or surplus), their required contribution rate will be less than the Normal Cost (i.e., a negative prior service rate equal to a 25-year open amortization of the OAAL).
- Overfunded cities that pay less than the Normal Cost push the funded ratio back toward 100% by using the surplus assets to pay for current year accruals, which also increases contribution rate volatility.
- To maintain a funding surplus and dampen contribution rate volatility, TMRS encourages these cities to pay their full Normal Cost each year until the funded ratio is at least 110%.



How to Make Additional Contributions

- Additional Contributions can be in the form of a lump sum payment or additional monthly payments and are not subject to the statutory maximum contribution rate limits that are applicable to some TMRS employers.
- There is no formal action that needs to be taken by a city to contribute at a higher level than the required monthly minimum.
- Additional monthly contributions may be made during the normal payroll reporting process by simply filling out line 2. A. of Form TMRS 3 with the increased employer contribution rate.
- Lump sum contributions should be reported separately from the regular payroll reporting process and submitted with Form TMRS 3ADD.



SAILING INTO RETIREMENT

Questions



Presentations available at www.tmr.com/ats.php