



The Direct Approach

Overview of TMRS Investments

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Investment Overview

- Performance and Asset Allocation
- Public Equities
- Fixed Income
- Real Estate
- Real Return
- Absolute Return
- Private Equity
- Compliance
- Risk Management

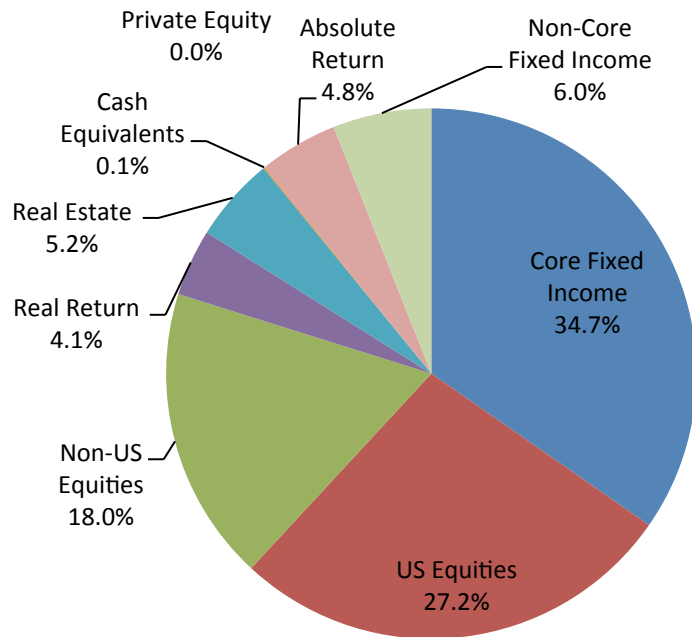


Performance and Asset Allocation

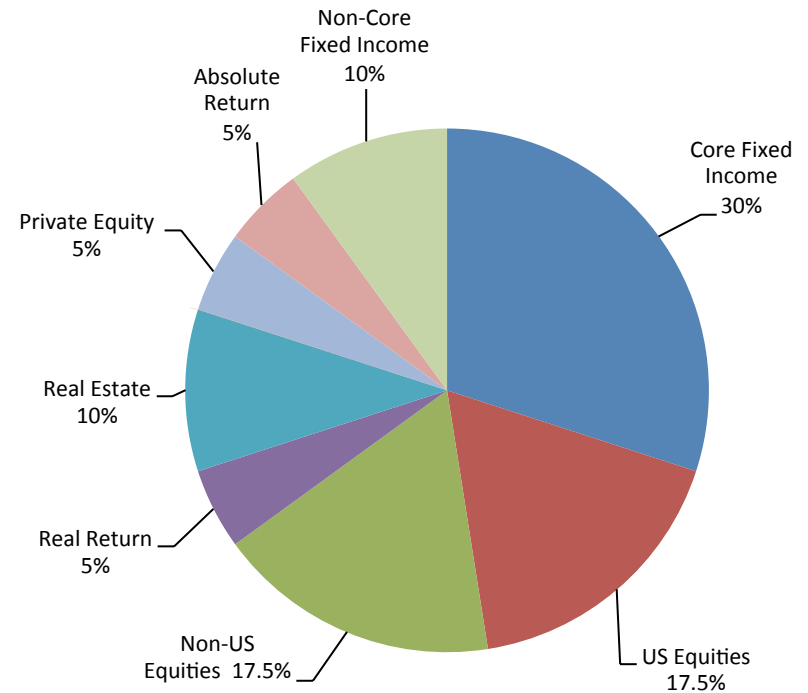
TMRS INVESTMENT PORTFOLIO

Asset Allocation

Allocation as of 6/30/15



Target Allocation Adopted Aug 2012



Total Market Value: \$24.0 Billion

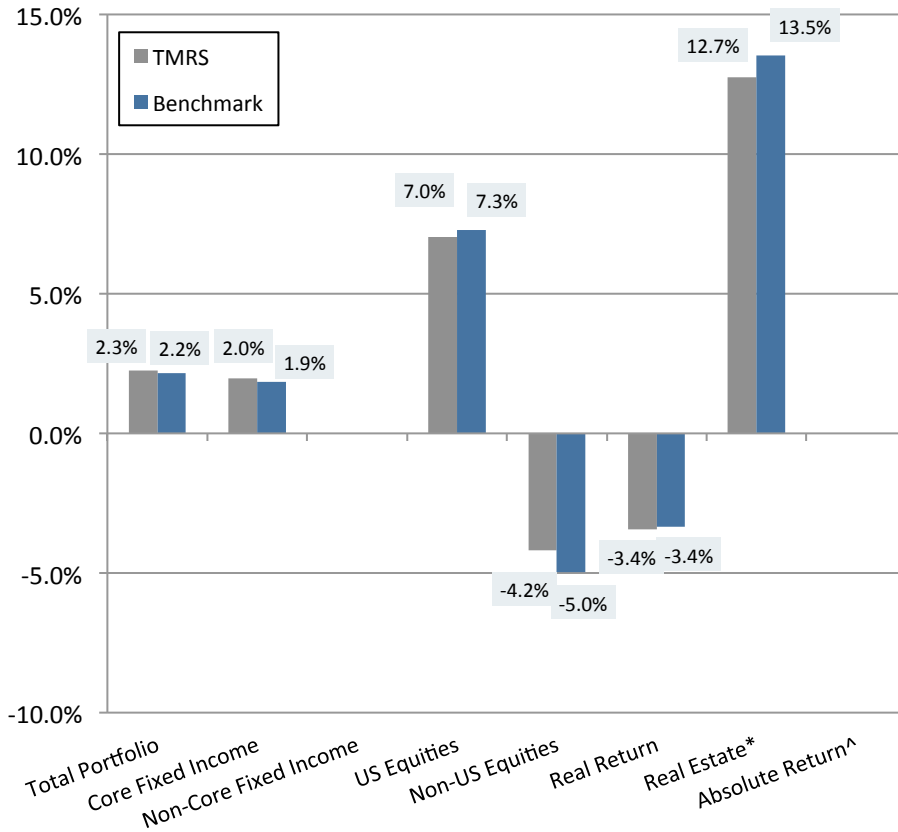
*Cash equivalents allocation represents unallocated invested cash equivalent instruments.
 NOTE: The sum of individual asset class allocations may not add up to 100% due to rounding.
 Source: State Street Investment Analytics

TMRS INVESTMENT PORTFOLIO

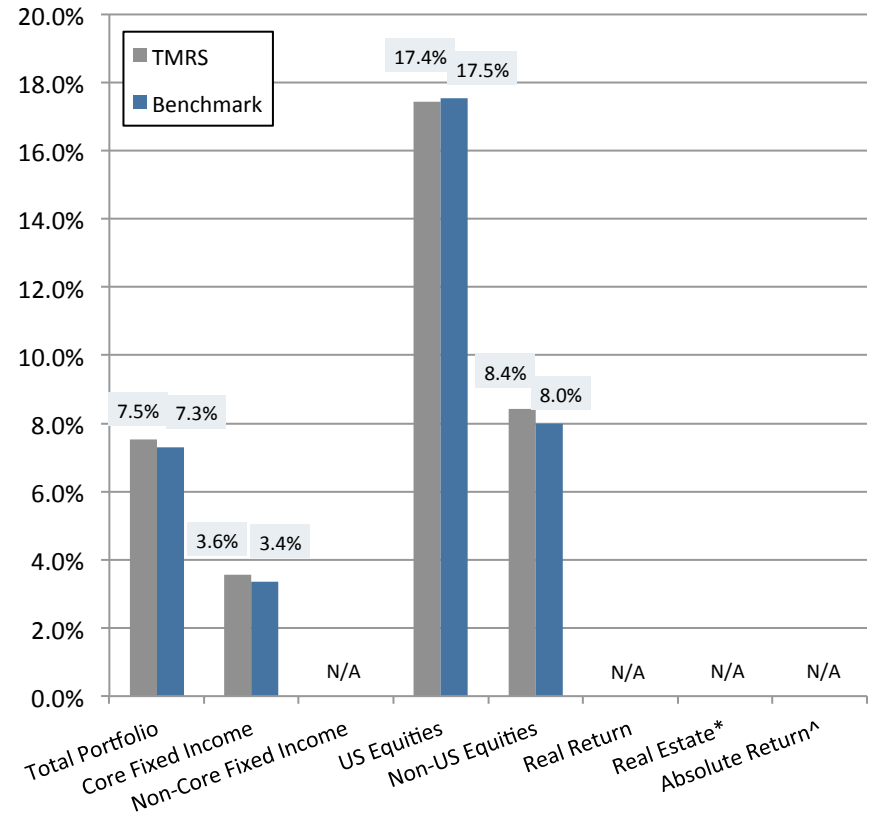
Performance By Asset Class

June 2015

1 Year Performance



5 Year Performance



Gross returns

*Real Estate return as of prior quarter end (real estate returns are available on a quarterly basis only);

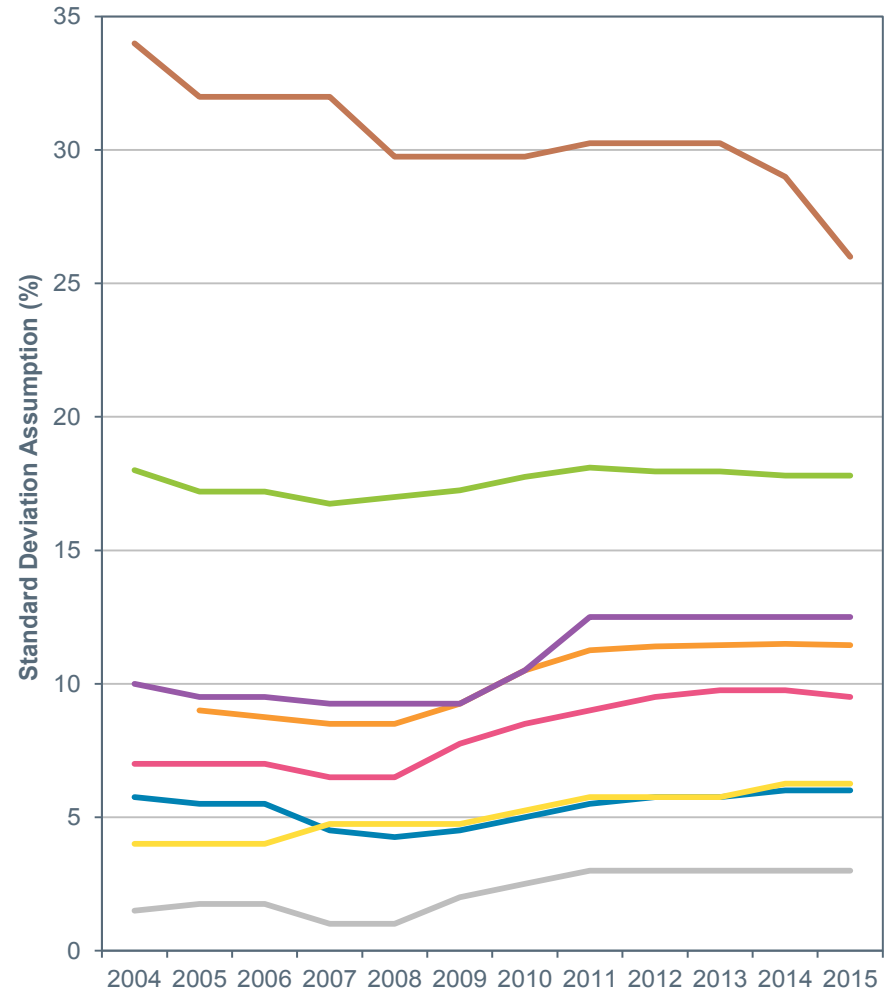
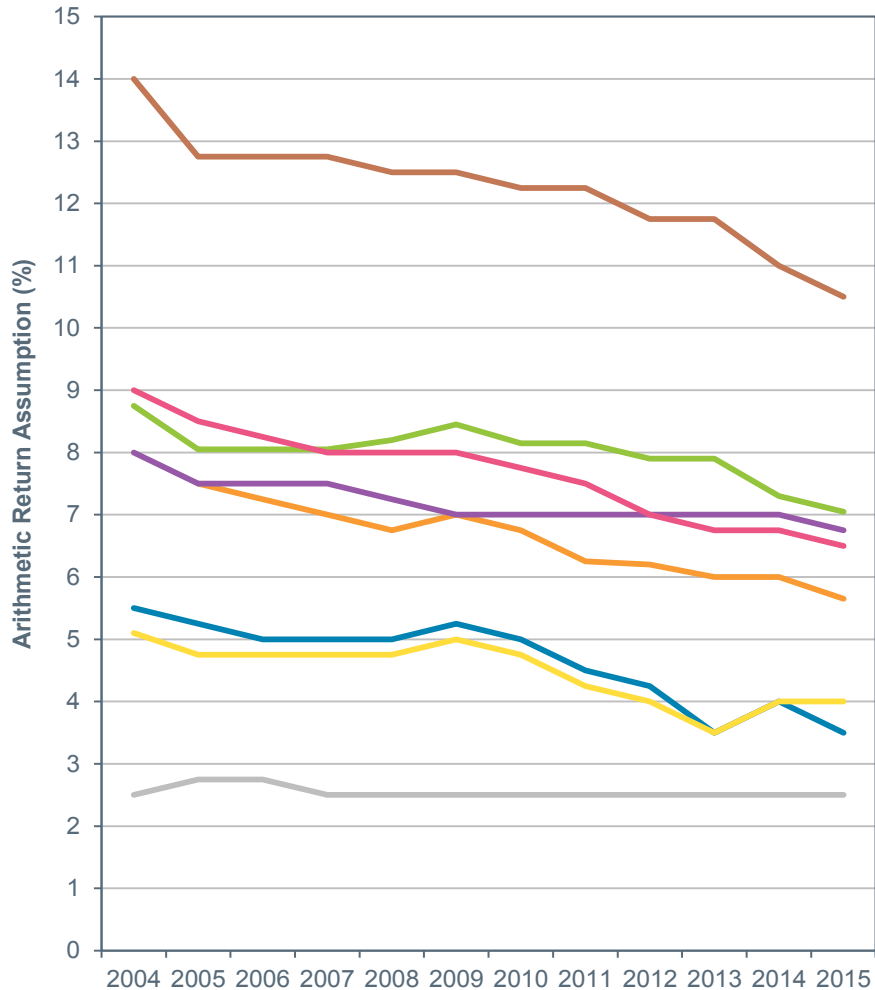
^Absolute Return performance is since inception (as of 8/1/14).

Source: State Street Investment Analytics

Asset Allocation Inputs

Historical Trend of Capital Market Assumptions

- Based on RVK assumptions over the last ten years



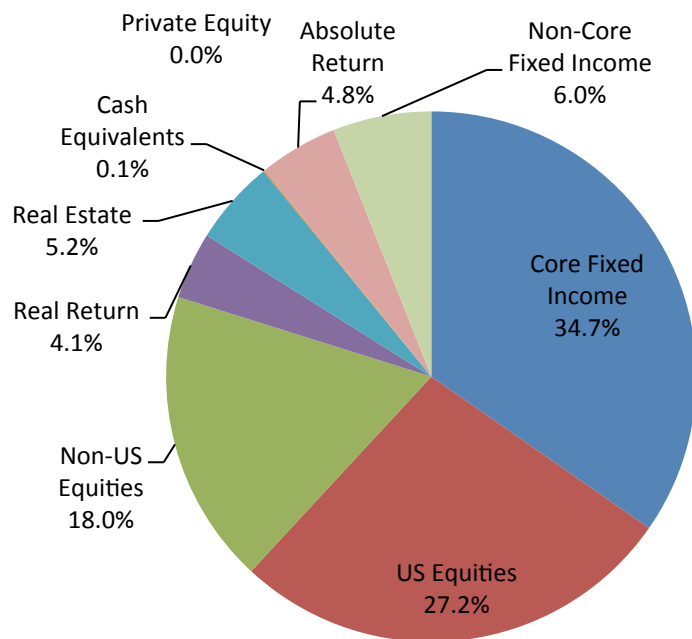
— Broad US Equity — Int. Duration Fixed Income — TIPS
— Core Real Estate — Diversified Hedge Funds — Private Equity

— Diversified Inflation Strategies
— US Inflation

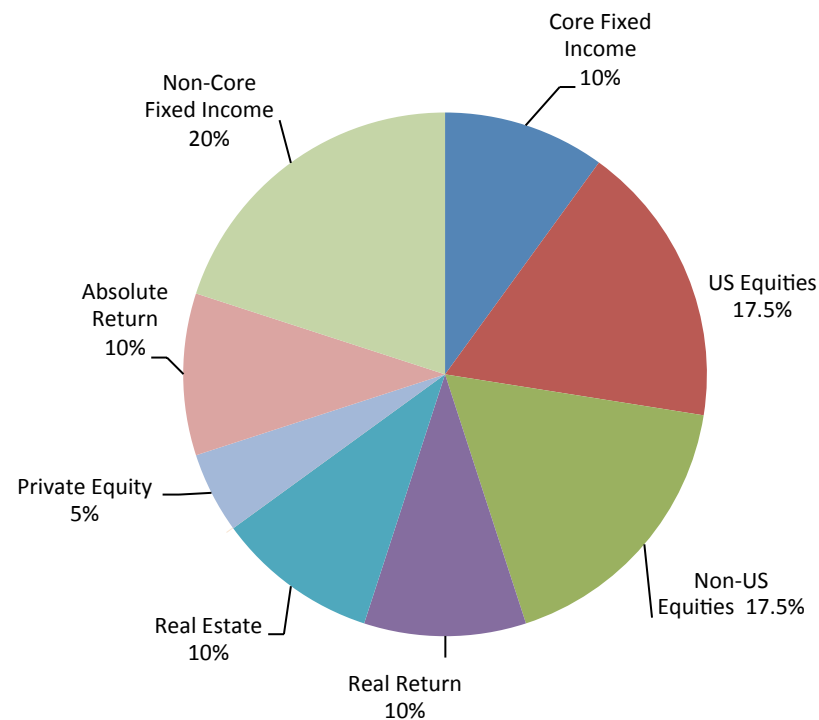
TMRS NEW TARGET INVESTMENT PORTFOLIO

Asset Allocation

Allocation as of 6/30/15



Target Allocation Adopted July 2015



Expected return reduced to 6.75%

*Cash equivalents allocation represents unallocated invested cash equivalent instruments.

NOTE: The sum of individual asset class allocations may not add up to 100% due to rounding.

Source: State Street Investment Analytics



Public Equities

Public Equities

Asset Class Overview

US Equity

- Objective
 - Intended to provide capital appreciation and is structured using a Core-Satellite Approach with the overall objective of exceeding its benchmark performance net of fees over rolling five year periods.
 - Satellite strategies (Active and Rules-Based) are expected to add excess return within established tracking error limits.

International Equity

- Objective
 - Intended to provide capital appreciation and diversification, and is structured using a Core-Satellite Approach with the overall objective of exceeding its benchmark performance net of fees over rolling five year periods.
 - Satellite strategies (Active and Rules-Based) are expected to add excess return within established tracking error limits.

Public Equities

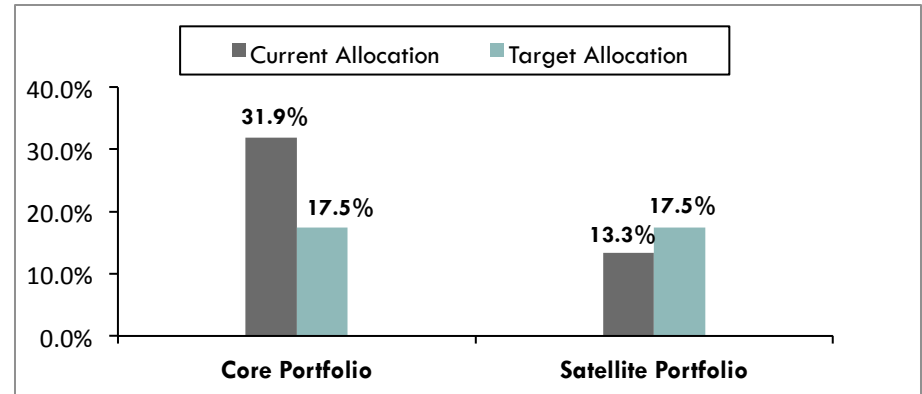
Portfolio Management Structure

ASSET CLASS	STRATEGY	MANAGER	PORTFOLIO BENCHMARK
Domestic Equities US Core/Passive	Passive Broad Market Index	Northern Trust Asset Management	Russell 3000 Index
US Rules-Based	Passive Fundamental Index	State Street Global Advisors	Russell US Fundamental Index
US Rules-Based	Passive Minimum Volatility	UBS Global Asset Management	MSCI US Min Vol Index
US Satellite/Active	US Traditional All Cap	Epoch Investment Partners, Inc.	Russell 3000 Index
US Satellite/Active	US Opportunistic All Cap	Sasco Capital, Inc.	Russell Mid Cap Value Index
US Satellite/Active	US Mid Cap Opportunistic	The Boston Company	Russell Mid Cap Index
US Satellite/Active	US Mid Cap Core	Champlain Investment Partners	Russell Mid Cap Index
US Satellite/Active	US Small Cap Opportunistic	The Boston Company (pending)	Russell 2000 Index
US Satellite/Active	US Small Cap Opportunities	Wellington Management (pending)	Russell 2000 Index
International Equities Non-US Core/Passive	Passive Broad Market Index	Northern Trust Asset Management	All Country World (ACW) ex US Investable Market Index (IMI)
Non-US Rules-Based	Passive Fundamental Index	State Street Global Advisors	Russell Fundamental Global ex US
Non-US Rules-Based	Passive Minimum Volatility	UBS Global Asset Management	MSCI World ex US Min Vol Index
Non-US Satellite/Active	Non-US Opportunistic Relative Value	Wellington Management	MSCI ACWI ex US Index
Non-US Satellite/Active	Non-US Opportunistic Core	Lazard Asset Management	MSCI ACWI ex US Index
Non-US Satellite/Active	Non-US Emerging Markets	Acadian Asset Management (pending)	MSCI Emerging Markets (EM) Index
Non-US Satellite/Active	Non-US Emerging Markets	William Blair & Company (pending)	MSCI Emerging Markets (EM) Index

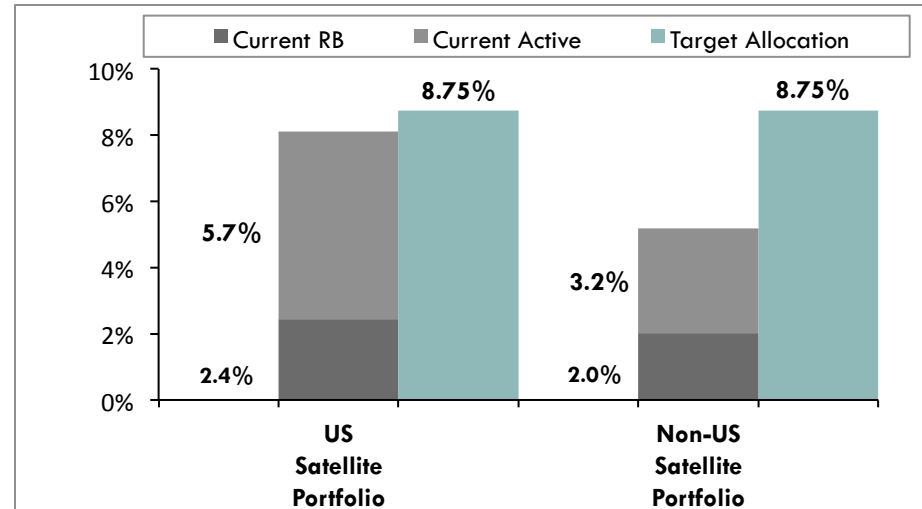
Core/Satellite Structure Allocation

*% of Total Fund as of 6/30/2015**

CORE Portfolio Managers	Market Value	% of Total Portfolio
US CORE EQUITY: NTGI Russell 3000	4,584,077,301	19.1%
NON-US CORE EQUITY: NTGI ACW ex. US IMI	3,066,053,948	13.0%
TOTAL:	7,650,131,249	31.9%



SATELLITE Portfolio Managers	Market Value	% of Total Portfolio
US RULES-BASED EQUITY:	584,127,667	2.4%
US ACTIVE EQUITY:	1,365,173,186	5.7%
NON-US RULES-BASED EQUITY:	487,251,465	2.0%
NON-US ACTIVE EQUITY:	758,810,139	3.2%
TOTAL:	3,195,362,457	13.3%



* All figures include the pending implementation of the non-US Emerging Market managers (Acadian & William Blair) that were approved in Sept. 2014 and the U.S. small cap managers (The Boston Co. and Wellington) that were approved in June 2015.

NOTE: Percentages may not be exact due to rounding

Public Equities

Pacing Plan Update

Year	Pacing Plan Update
2010-2011	<ul style="list-style-type: none"> Market volatility causes completion of target allocation (40%) to be extended to Dec. 2011 from Dec. 2010; NTGI's bi-monthly redemptions for the lending funds was completed in June 2010; Diversification expands; conversion from EAFE to ACW ex. US IMI NL fund began in Aug. 2010; In 2011, investment staff begins analyzing additional strategies to further diversify the equity portfolio; Full conversion from EAFE to ACW ex. US IMI NL fund was completed in 2011; 33% allocation to equities as of Dec. 2010; equity portfolio reached full target allocation of 40% in 2011.
2012-2013	<ul style="list-style-type: none"> Mar. 2012, Trustees approve core/satellite structure with initial allocation to rules-based strategies; Sept. 2012, Trustees approve selection of two managers for rules-based strategies, Fundamental Indexing and Minimum Volatility; Min Vol portfolios funded in Dec. 2012 & Fundamental Indexing funded in Jan. 2013; Sept. 2013, the Board approved Epoch and Sasco for U.S. All Cap (AC) active strategies for the satellite allocation of the equity portfolio; a 4% allocation was funded from the core portfolio in Dec. 2013. 42.7% allocation to equities as of Dec. 2012; 40.7% core (passive), 2% satellite (active) rules-based strategies. 48.6% allocation to equities as of Dec. 2013; 42.4% core (passive), 6.2% satellite (active) strategies.
2014	<ul style="list-style-type: none"> Phase I non-U.S. manager recommendations (Lazard & Wellington) were approved by the Board at the March 2014 Board meeting; performance started September 1st. Phase II of the equity re-structure's focus is on U.S. mid-cap and non-U.S. emerging markets; US Mid Cap managers recommendations (The Boston Company and Champlain) were approved by the Board at the June 2014 Board meeting; performance started on December 1st. Phase II non-U.S. emerging markets search began in May 2014 and manager recommendations (Acadian and William Blair) were approved by the Board at the September Board meeting; implementation is in process. 45.1% allocation to equities as of Dec. 2014; 35.4% core (passive), 9.7% satellite (active) strategies.
2015	<ul style="list-style-type: none"> 2014 Phase II non-US emerging markets onboarding for Acadian & William Blair – in process; Q1/Q2 2015 search project Tax Consultant/Tax Advisor to assist with emerging markets sub-custodian setup and sec lending; 2015 Phase III US Small Cap manager recommendations – June 2015 Board meeting; 2015 Phase III non-US Small Cap manager recommendations – September 2015 Board meeting; 2015 Equity Core/Satellite Target Allocation – target satellite allocations to be completed; 2015 Equity Asset Class Review presented at December 2015 Board meeting. 45.2% allocation to equities as of June 2015; 31.9% core (passive), 13.3% satellite (active) strategies.



Fixed Income

Core Fixed Income Asset Class Overview

- US Core Fixed Income
 - Objective
 - Purpose is to enhance total return and provide diversification to the overall investment portfolio.
 - US Core performance objective is to exceed the Barclay's US Aggregate Bond Index net of fees and rank above the median manager in peer universe, over rolling 5-year periods and be within tracking errors as specified in the manager contracts.
 - US Core Plus performance objective is to exceed Barclay's Aggregate Index by 35 bps net of fees with a maximum expected tracking error of 150 bps and rank above the median manager in peer universe, over rolling 5-year periods.
- Investment Philosophy- BlackRock
 - Top down determination of investment themes are based on bottom-up inputs. Investment themes establish parameters for sector, sub-sector and security selection. Macro overlays for duration and volatility are viewed as a separate sector and used opportunistically.
- Investment Philosophy- PIMCO
 - PIMCO's investment philosophy is driven by diversifying strategies and focuses on longer term secular (3-5 year) trends.
 - Seek to add value through top down strategies including interest rate exposures, duration, volatility, yield curve positioning and sector rotation.
 - Employ "bottom-up" strategies through in depth credit analysis and specific security selection.

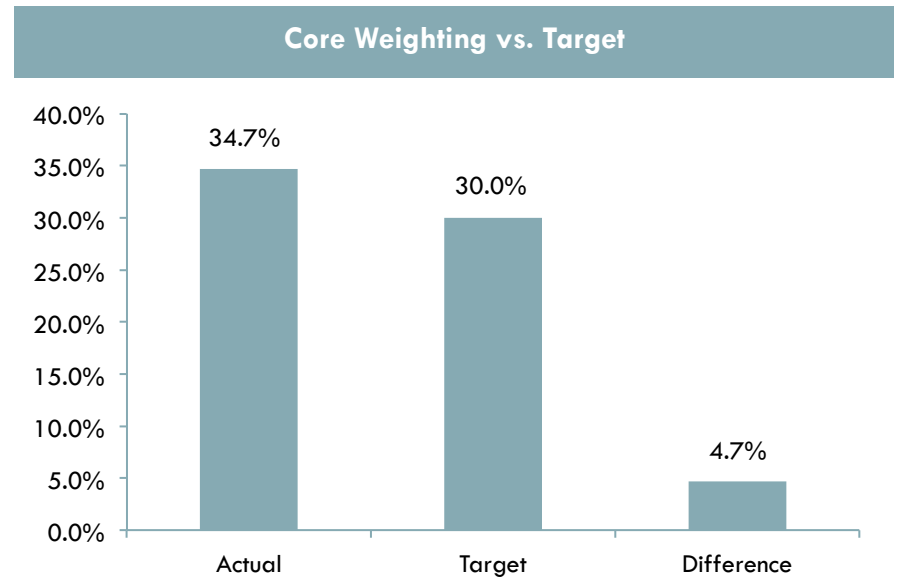
Core Fixed Income Portfolio Management Structure

STRATEGY	MANAGER	PORTFOLIO BENCHMARK
US Core (enhanced index)	BlackRock	Barclays US Aggregate Bond Index
Active Core Plus	PIMCO	Barclays US Aggregate Bond Index

Core Fixed Income Allocation

As of June 30, 2015

Mandate	Market Value	% of Total Fund
CORE FIXED INCOME		
BlackRock	\$6,279,464,755	26.15%
PIMCO	\$2,045,059,774	8.52%
TOTAL	\$8,324,524,528	34.67%



Core Fixed Income Pacing Plan Update

Year	Pacing Plan Update
2010	<ul style="list-style-type: none"> February – Board education piece on Derivatives presented Core Fixed Income continues to fund Equities
2011	<ul style="list-style-type: none"> Core Fixed Income continues to fund diversification of total plan including Equities, Real Return and Real Estate
2012	<ul style="list-style-type: none"> August – Board approved changing the target allocation from 35% to 30% in conjunction with the Asset Allocation Study Core Fixed Income continues to fund diversification of the total plan
2013	<ul style="list-style-type: none"> September – Board approved Non-Core Fixed Income managers (Loan/CLO) \$750M to be funded from Core Fixed Income Core Fixed Income continues to fund diversification of the total plan
2014	<ul style="list-style-type: none"> June – Board approved Non-Core Fixed Income managers (RMBS/CMBS) \$750M to be funded from Core Fixed Income September – December- ongoing funding of Loan/CLO portfolios December – \$500M RMBS/CMBS portfolios fully funded Core Fixed Income continues to fund diversification of the total plan
2015	<ul style="list-style-type: none"> February - \$500M CLO/Loan portfolios fully funded March – Board approved reallocating previously approved allocation of \$250M each for Bank Loan/CLO and RMBS/CMBS strategies to existing managers to be funded from Core Fixed Income April – May – reallocation of RMBS/CMBS fully funded; funding continues for Bank Loan/CLO portfolios Core Fixed Income continues to fund diversification of the total plan

Non Core Fixed Income Asset Class Overview

- Objective
 - The purpose is to enhance total return through income and capital appreciation and provide diversification to the total investment portfolio. This allocation may be managed actively and/or passively through multiple managers in consideration of manager concentration risk.
 - The Performance Objectives is to exceed the returns of a blended benchmark comprised of the Barclays US Corporate High Yield Index 50%, the JPM GBI-EM Global Diversified Index (USD Unhedged) 25%, and JPM CEMBI Broad Diversified Index 25%, net of fees over rolling five-year periods and within tracking errors as specified in the manager contracts or otherwise agreed to in writing, determined according to the specific strategies employed.

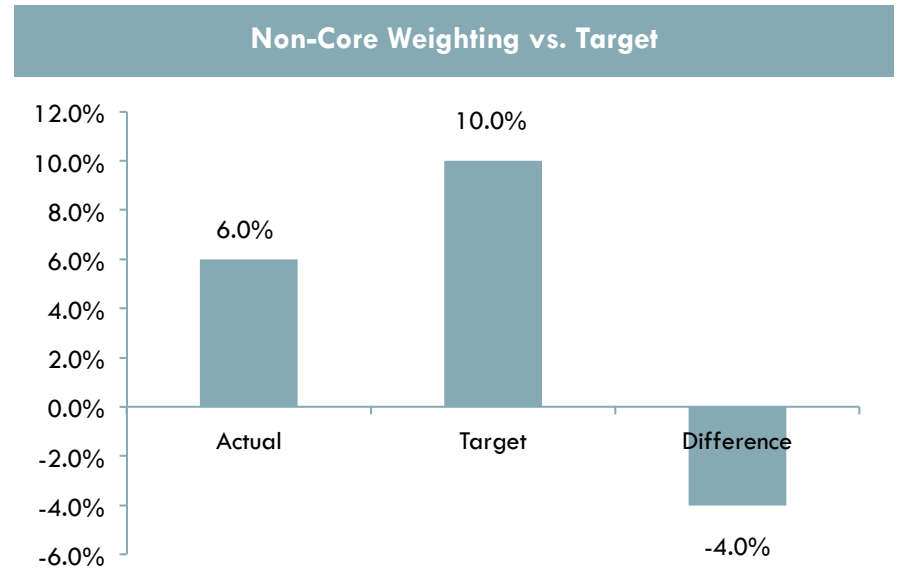
Non-Core Fixed Income Portfolio Management Structure

STRATEGY	MANAGER	PORTFOLIO BENCHMARK
Bank Loan/CLO Debt	Highland Capital	Credit Suisse Leveraged Loan Index
Bank Loan/CLO Debt	Guggenheim	Credit Suisse Leveraged Loan Index
RMBS/CMBS	Voya Investment Management (formerly ING Investment Mgmt)	33% Barclays US Agg Corp Index and 67% Barclays US Corp High Yield Index
RMBS/CMBS	Ellington Management Group	33% Barclays US Agg Corp Index and 67% Barclays US Corp High Yield Index

Non-Core Fixed Income Allocation

As of June 30, 2015

Mandate	Market Value	% of Total Fund
NON-CORE FIXED INCOME		
Guggenheim	\$296,636,596	1.24%
Highland	\$385,346,340	1.60%
Voya Investment Management	\$378,988,475	1.58%
Ellington Management Group	\$379,968,670	1.58%
TOTAL	\$1,440,940,081	6.00%



Non-Core Fixed Income Pacing Plan Update

Year	Pacing Plan Update
2012	<ul style="list-style-type: none"> • August – Board approved segregating Non-Core Fixed Income from Core Fixed Income and making it a separate asset classes for better transparency and control. Board also approved 10% target allocation to Non-Core in conjunction with the Asset Allocation study.
2013	<ul style="list-style-type: none"> • March – Educational session presented to Board (Intro to Non Core) • June – Board approved Non-Core Fixed Income allocation and authorized manager search for the Bank Loan/CLO strategy • September – Board approved Manager selections for Bank Loan/CLO strategy • December – Board approved 2014 Pacing Plan, including a manager search for the RMBS/CMBS strategy
2014	<ul style="list-style-type: none"> • May – Board approved increasing the sector allocation limit from 25% to 40% of the Non-Core Fixed Income asset class. Board also approved manager selections for RMBS/CMBS strategy. • December – Board approved Pacing Plan, including a manager search for Emerging Market Debt (EMD) Managers
2015	<ul style="list-style-type: none"> • February – Emerging Market Debt Manager search completed • March – Board approved reallocating previously approved allocation of \$250M each for Bank Loan/CLO and RMBS/CMBS strategies to existing managers • May – Board approved Emerging Market Debt Manager recommendations • June- Direct Lending Manager search in process; to be presented at December meeting



Real Estate

Real Estate Asset Class Overview

- **Objective**
 - To enhance total return and provide diversification to the overall investment portfolio.
 - Due to the illiquid and cyclical nature of the real estate asset class, Staff and the Real Estate Investment Consultant recommend that the target allocation be invested over a multi-year period in order to avoid considerable vintage year risks.
- **Performance Objective**
 - Long term performance objective is a real rate of return (adjusted for inflation) of five percent (5%) net of investment management fees.
 - The real estate portfolio is expected to generate returns net of all fees and expenses, in excess of their respective indices, over rolling five year investment time horizons.

Real Estate Portfolio Management Structure

Manager	Strategy	Allocated/Committed	Drawn / Invested (Quarterly)
Abacus Core Income Fund I	Core	\$ 75,000,000	\$ 47,210,735
Harrison Street Core Property Fund	Core	\$ 150,000,000	\$ 150,000,000
Invesco US Core Income Fund	Core	\$ 150,000,000	\$ 150,000,000
Smart Markets Fund	Core	\$ 200,000,000	\$ 200,000,000
Walton Street Debt Fund	Core Debt	\$ 100,000,000	\$ -
Harrison Street Securities	Core RE Securities	\$ 150,000,000	\$ 150,000,000
Abacus Multi-Family Fund II	Value Add	\$ 50,000,000	\$ 46,704,829
Abacus Multi-Family Fund III	Value Add	\$ 75,000,000	\$ 740,517
Greenfield Acquisition Partners VI	Value Add	\$ 75,000,000	\$ 51,337,514
Greenfield Acquisition Partners VII	Value Add	\$ 100,000,000	\$ 52,817,803

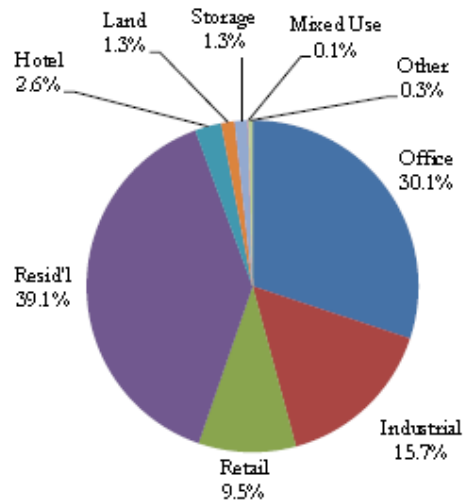
Real Estate Portfolio Management Structure, Cont.

Manager	Strategy	Allocated/Committed	Drawn / Invested (Quarterly)
Miller Global	Value Add	\$ 75,000,000	\$ 43,869,639
Rubenstein Properties II	Value Add	\$ 75,000,000	\$ 19,847,330
Stockbridge Value Fund I	Value Add	\$ 75,000,000	\$ 58,983,571
Stockbridge Value Fund II	Value Add	\$ 75,000,000	\$ 26,677,067
Lubert-Adler Fund VII	Opportunistic	\$ 100,000,000	\$ 25,000,000
Moorfield Real Estate Fund III ***	Opportunistic	\$ 78,560,000	\$ 9,945,668
Walton Street	Opportunistic	\$ 75,000,000	\$ 55,011,749
TOTAL		\$ 1,683,000,000	\$ 1,084,335,979

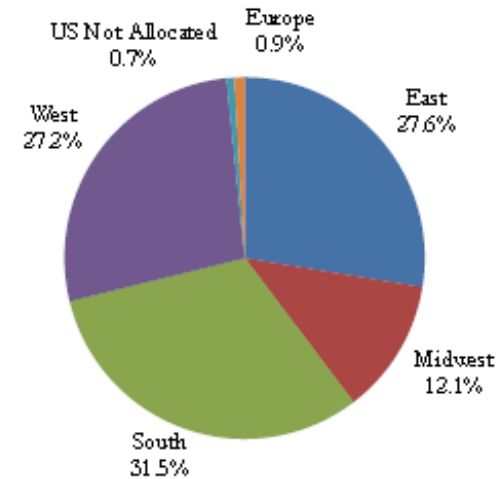
*** £50MM commitment, converted to USD at month end rates (source: Bloomberg, June 2015)

Real Estate Portfolio Diversification

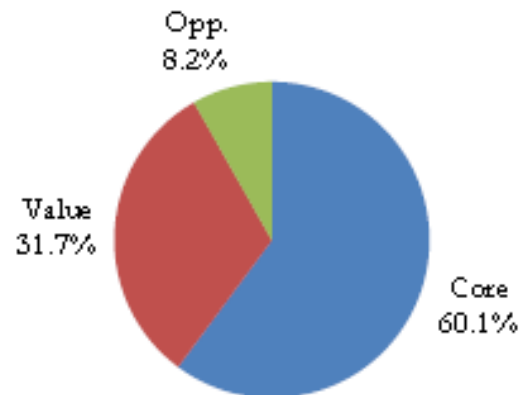
Property Type Diversification Based on Market Value



Geographic Diversification Based on Market Value



Sector Diversification Based on Market Value



Real Estate

Pacing Plan Update

Year	Pacing Plan Update
2009	<ul style="list-style-type: none"> February – Board educational session presented to Board September – Board authorized Real Estate Consultant search
2010	<ul style="list-style-type: none"> May – Board approved ORG as Real Estate Consultant October – Board educational session presented to Board
2011	<ul style="list-style-type: none"> March - Board approved selection of three managers and the 2011 Pacing Plan June – Board educational session presented to Board (Real Estate: Fee Structures) September – Board approved selection of four managers December – 2012 Pacing Plan approved by Board
2012	<ul style="list-style-type: none"> March – Board approved selection of four managers December – Board approved selection of four managers and the 2013 Pacing Plan
2013	<ul style="list-style-type: none"> March – Board approved selection of three managers September – Board approved selection of four managers December – Board approved 2014 Pacing Plan
2014	<ul style="list-style-type: none"> March – Board approved selection of three managers September – Board approved selection of five managers December – Board authorized the Real Estate Consultant search and approved 2015 Pacing Plan.
2015	<ul style="list-style-type: none"> March – Board approved Courtland as the Real Estate Consultant



Real Return

Real Return Asset Class Overview

Global Linkers

- **Objective**
 - Purpose is to enhance total return and provide diversification and hedge against inflation risks to the overall investment portfolio.
 - Performance objective is to exceed the Barclay's Capital World Government Inflation-Linked Bond Index Unhedged in US Dollars net of fees.
- **Investment Philosophy – Colchester**
 - Colchester has a value-oriented philosophy. The firm believes that investment should be valued in terms of the income they will generate in real terms.
 - Seek to add value through high quality global sovereign bonds providing the highest real yields.
 - Benefits of specialization and unique use of smaller markets increase diversity and add potentially higher return opportunities.

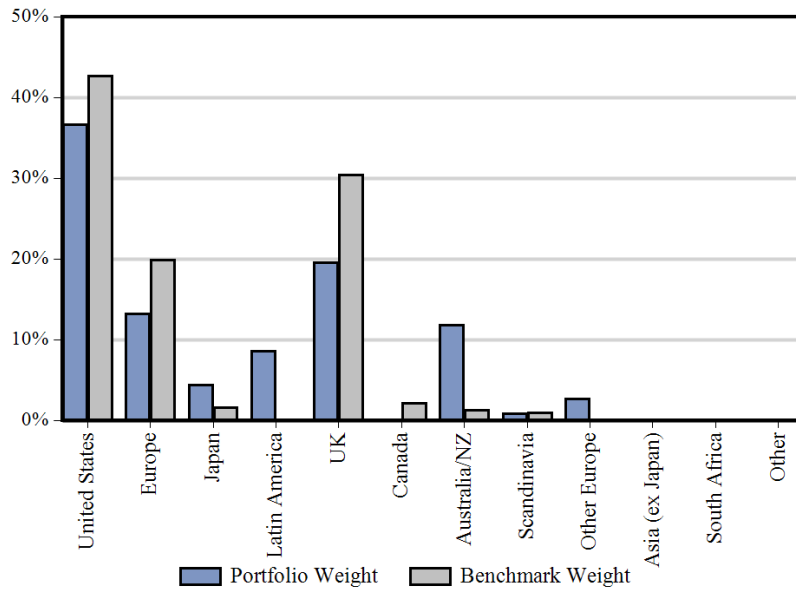
Real Return Portfolio Management Structure

STRATEGY	MANAGER	PORTFOLIO BENCHMARK
Active Global Linkers	Colchester	Barclays World Govt Infl-Linked Bond Index

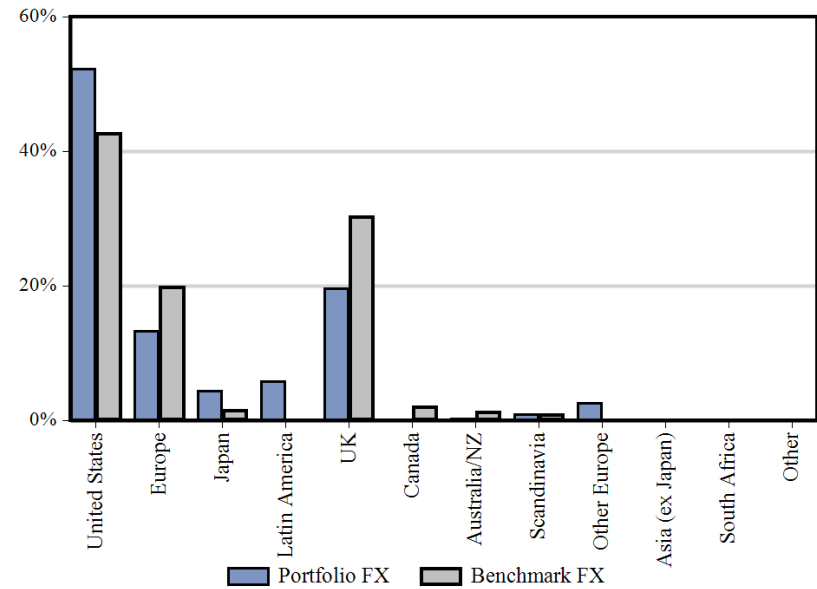
Real Return Allocation

June 2015

Country Exposure (%)



Currency Exposure (%)



*Source: Colchester

1. Barclays World Government Inflation-Linked Bond Index USD Unhedged
2. TMRS inception date Feb. 1, 2011
3. Annualized returns since inception)

Real Return Pacing Plan Update

Year	Pacing Plan Update
2010	<ul style="list-style-type: none"> • June – Board approved Real Return Interim Target Allocation and ratification of Manager Search • September – Board approved Colchester as Real Return Manager
2011	<ul style="list-style-type: none"> • Fully funded through Global Inflation-Linked Bond (GILB) strategy
2014	<ul style="list-style-type: none"> • March - Real Return transferred from Fixed Income to Real Estate • June – Educational session presented to Board; Board authorized Real Return Consultant search • October - Board approved selection of Albourne America, LLC., as the Real Return Consultant • December – Educational session presented to the Board
2015	<ul style="list-style-type: none"> • March - The contract with Albourne America was successfully executed



Absolute Return

Absolute Return Asset Class Overview

- Objective

- Purpose is to diversify equity and credit market risk by targeting hedge fund return streams that are independent of the directionality of the broad stock and bond markets. The ARS portfolio will be invested in a wide variety of hedge fund strategies, with specific constraints on overall portfolio risk and individual manager exposure.
- Performance objective is to exceed the benchmark, defined as the HFRI Fund of Funds Index, net of fees, and to earn in excess of cash (90-day Libor) plus 5% on an ongoing rolling 5-year period.

- Investment Philosophy

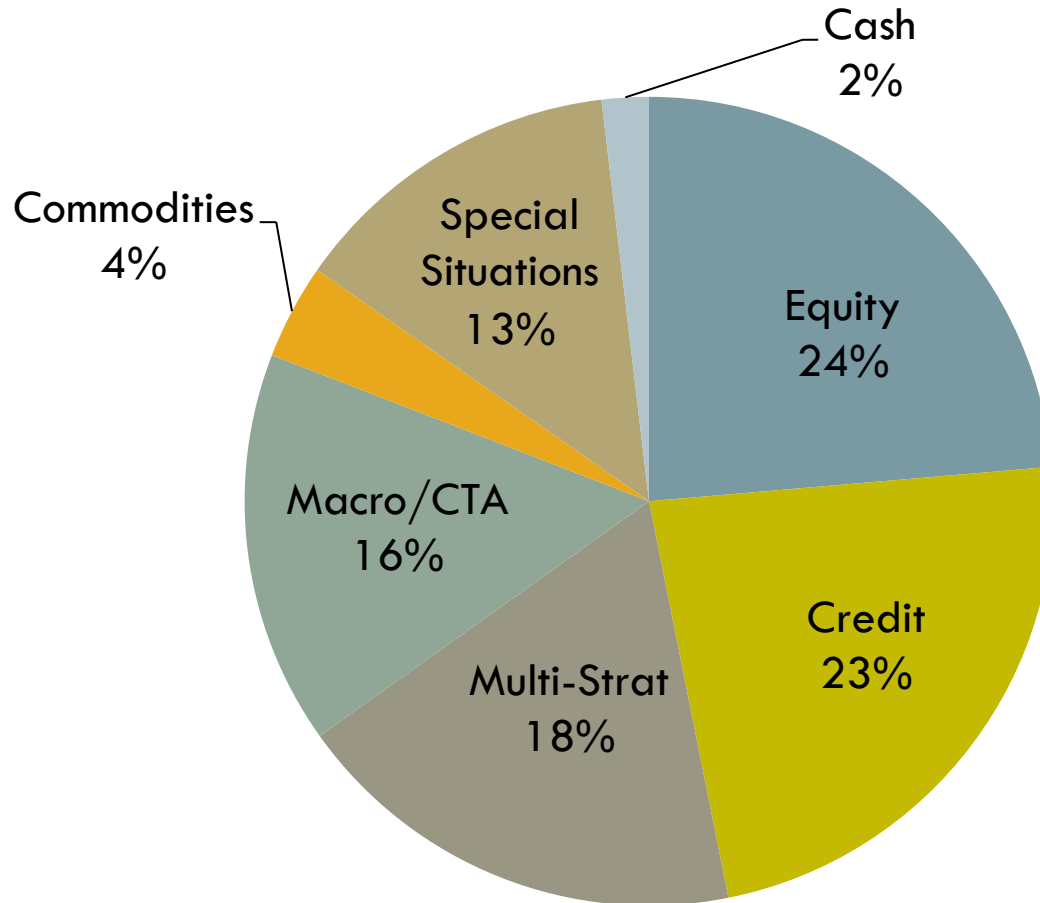
- Predicated on manager skill in:
 - Rotating (long/short trading) market factors based on valuation
 - Navigating less liquid, non public and opaque markets
 - Navigating special situations
 - Predicting and capturing market trends
- Accordingly, ARS is not an “asset class” (or market sector)

Absolute Return Portfolio Management Structure

STRATEGY	MANAGER	PORTFOLIO BENCHMARK
Customized Fund of One	Blackstone	HFRI Fund of Funds Multi-Strategy Index

Current BAAM Allocation (Strategy Exposures)

Aggregated Manager Exposures



Source: BAAM one month lag

Absolute Return Pacing Plan Update

Year	Pacing Plan Update
2011	<ul style="list-style-type: none"> October – Educational session presented to Board (Part 1: Intro to ARS)
2012	<ul style="list-style-type: none"> February – Educational session presented to Board (Part 2: Intro to ARS) June – Educational session presented to Board (Part III: Risk and Risk Mitigators) October – Educational session presented to Board (Part IV: ARS Implementation Options)
2013	<ul style="list-style-type: none"> September – Board approved implementation strategy and authorized manager search
2014	<ul style="list-style-type: none"> February – Board approved hiring Blackstone as Absolute Return Manager June - Educational session presented to Board (Part V); Board authorized Absolute Return Consultant search August - Asset class funded October - Board approved selection of Albourne America, LLC., as the Absolute Return Consultant
2015	<ul style="list-style-type: none"> March – The contract with Albourne America was successfully executed June – Hired Absolute Return Analyst July – Board approved increase in ARS target allocation from 5% to 10% Hire additional legal staff Q2-Q3 to ramp up for ARS, PE, RE mandates Approximately October 2015: First direct hedge fund investments <ul style="list-style-type: none"> Group of 5-6 managers / approximately \$400 M
*2016	<ul style="list-style-type: none"> Approximately Q1 2016: Second group of direct hedge fund allocations <ul style="list-style-type: none"> Group of 5-6 managers / approx. \$400M Anticipate an allocation to managers approximately every 6 months <ul style="list-style-type: none"> Group of 10-15 managers / approximately \$300-\$600M Fully Diversified Portfolio: approximately 20-25 hedge funds across strategies / sub-strategies and opportunistic, niche strategies Monitor and selectively add/redeem/rebalance

* Subject to Board Approval in December.



Private Equity

Private Equity Asset Class

- Objective

- The primary objective is to enhance the total return of the overall investment portfolio, and secondarily to provide diversification. Private Equity investments are commingled funds structured as limited partnerships with capital commitments that are drawn down over time based on manager discretion. Potential distributions are made as a fund matures and investments are typically realized over an 8-12 year horizon.
- The performance objective is to exceed the short term benchmark (to be defined) net of fees, and to earn in excess of S&P 500 + 5%* over a full market cycle.

- Investment Philosophy

- Manager selection is critical, and managers add value through:
 - Reducing agency conflicts and aligning equity holder/executive incentives
 - Investment structuring and balance sheet management
 - Deep sector experience and creating operating efficiencies
 - Navigating non-public information and capturing illiquidity premia
- *Note: Implementation of this asset class is currently in the planning stages. Due to the illiquid nature of the Private Equity asset class, the target allocation will be invested over a multi-year period in order to avoid considerable vintage year risks.*

* Legacy objective subject to review and change.

Private Equity Portfolio Management Structure

STRATEGY	MANAGER	PORTFOLIO BENCHMARK
Under development		

Private Equity Allocation

This Asset Class is under development.

Private Equity Pacing Plan Update

Year	Pacing Plan Update
2014	<ul style="list-style-type: none"> • August – Educational session presented to the Board • December – Hired Director of Private Equity
2015	<ul style="list-style-type: none"> • February - Staff private equity education session • July - The contract with StepStone Group was successfully executed • Private Equity Analyst search underway • Approximately October 2015: First private equity manager recommendation <ul style="list-style-type: none"> • Group of 4-5 managers / approximately \$250 M • Possibly December 2015: Additional private equity manager recommendation(s) <ul style="list-style-type: none"> • Group of 1-3 managers / approximately \$50 M to \$150 M
*2016	<ul style="list-style-type: none"> • Approximately Q1 2016: Additional private equity allocation <ul style="list-style-type: none"> • Group of 1-3 managers / approx. \$125 M • Approximately Q2 2016: Additional private equity allocation <ul style="list-style-type: none"> • Group of 1-3 managers / approx. \$125 M • Approximately Q3 2016: Additional private equity allocation <ul style="list-style-type: none"> • Group of 1-3 managers / approx. \$125 M • Approximately Q4 2016: Additional private equity allocation <ul style="list-style-type: none"> • Group of 1-3 managers / approx. \$125 M

* Subject to Board Approval in December



Compliance

Compliance Overview

- **IPS Objectives**
 - The primary objective of Compliance is to implement a detailed compliance program which uses a combination of daily, weekly and monthly testing of all testable parameters of the Investment Policy Statement and all Manager guidelines at the Manager, asset class and total fund level, as appropriate.
 - Testing may be completed either through systematic resources (automated custodial compliance) or manually if necessary.
 - Compliance personnel shall create and present a quarterly report to the Board with the results of the testing performed during each period.










































Compliance Testing

Test Type	State Street Tests	Internal (State Street Beta Tests)	Total Tests
Quality/Credit Quality	27	26	53
Liquidity/Cash Management	4	0	4
Permissible/Prohibited	25	15	40
Concentration	65	52	117
Interest Rate Risk	3	0	3
Spread Risk	0	6	6
Total Number of Tests	124	99	223

- 223 separate compliance tests were run on TMRS portfolios as of June 30, 2015. All funds were in compliance with TMRS guidelines.
- The internal tests have been developed to run using State Street's Charles River system and are currently in beta testing mode. Until tests are finalized & moved to production, the tests are run internally using Bloomberg.

Investment Guideline Compliance

June 2015

Policy Guidelines	Core Fixed Income	Non-Core Fixed Income	Real Return	Domestic Equities	Global Equities
Credit Quality					
Liquidity/Cash Management					
Permissible/Prohibited Investments					
Concentration Risk					
Country/Region & Currency					
Issue/Issuer					
Sector & Asset Type					
Interest Rate Risk				N/A	N/A
Spread Risk				N/A	N/A

- 223 separate compliance tests were run on TMRS portfolios as of June 30, 2015. All funds were in compliance with TMRS guidelines.



Risk Management

Risk Management Overview June 2015

- **Objective**
 - Identification, evaluation and management of all risks related to investment results.
- **Responsibilities:**
 - Defining the policy and strategy for investment risk management
 - Building a risk aware culture within the organization
 - Analytical tools for investment risk management
 - Reporting on investment risk to the Board
- **Risk Report: Q2 2015**
 - In this report we introduce a slightly expanded breakdown of Active Risk (Tracking Error) sources
 - Pending Policy Allocation Decisions
 - Investment Allocation Decisions
 - Strategy Benchmark Decisions
 - Active Manager Decisions
 - This report also introduces the new Strategic Target Allocation (adopted July 2015)
 - Tracking error given the new Strategic Target Allocation has increased but is still within our 2% Active Risk Budget
 - Projected short term volatility continues to be lower than our strategic volatility assumptions

We show total fund risk to see what current market risk levels are relative to our long term assumptions.

Total Fund Risk

June 2015

Extreme or persistent differences may cause us to rethink our long term assumptions (RVK makes small adjustments every year) otherwise it just provides background information as to the state of the markets.

	BarraOne – One year outlook						RV Kuhns
	Portfolio			Policy Benchmark			Long Term Assumptions ¹
	Weight (%)	Risk	Contribution to Total Risk	Weight (%)	Risk	Contribution to Total Risk	Benchmark
							Risk
Total	100.0%	6.40	100.0%	100.0%	7.26	100.0%	11.4
Cash Assets	0.2%	0.00	0.0%	0.0%	0.00	0.0%	3.0
Equity - US	27.7%	12.81	50.9%	17.5%	12.86	27.4%	17.8
Equity - Non US	18.3%	14.31	37.0%	17.5%	14.55	32.5%	20.6
Core Fixed Income	35.3%	4.09	3.8%	10.0%	4.13	0.3%	6.0
Non-Core Fixed Income	4.6%	4.64	0.9%	20.0%	6.50	14.7%	11.7
Real Estate	4.8%	7.60	3.5%	10.0%	12.38	7.9%	14.6
Real Return	4.2%	5.77	1.9%	10.0%	6.74	4.4%	8.8 ²
Absolute Return	4.9%	4.04	1.9%	10.0%	4.02	3.5%	9.5
Private Equity	0.0%	0.00	0.0%	5.0%	15.73	9.4%	26.0

- Both the “One Year Outlook” and “Long Term Assumption” risks are higher for the new Policy Benchmark.
- Projected short term (one year) volatility continues to be significantly lower than our strategic (long term) volatility assumptions

NOTES: 1. RVK forward -looking risk assumptions as presented in the July 2015 Asset Allocation Study

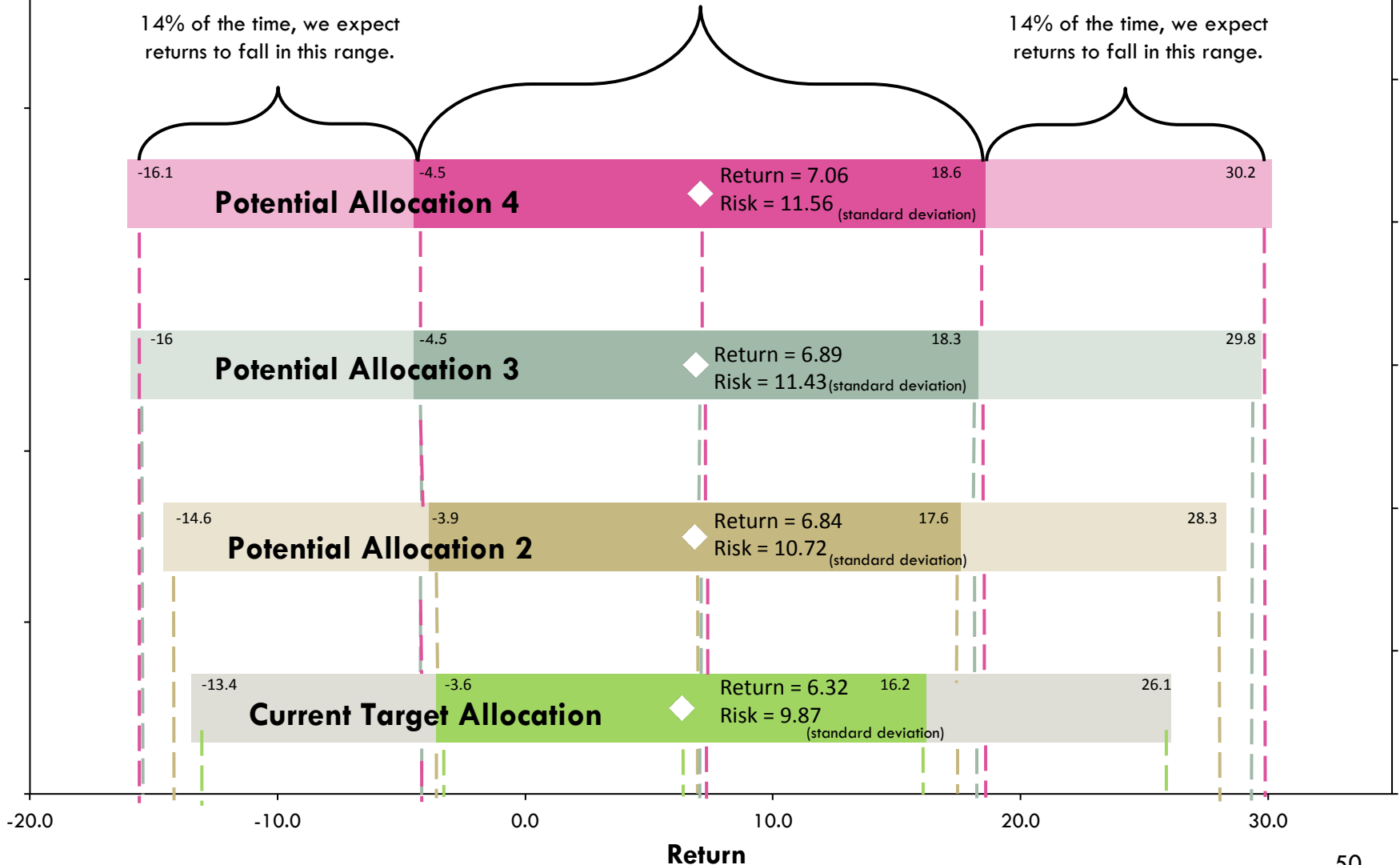
2. Assumes a Real Return asset class benchmark of 100% Global Inflation Linked Bonds until the new Policy Benchmark is implemented

Asset Allocation Return Expectations

68% of the time, we expect the return to fall within one standard deviation of expected return.

14% of the time, we expect returns to fall in this range.

14% of the time, we expect returns to fall in this range.



Please note, this measure of risk is not the only risk to consider.

Risk Management

Update on What We Are Working On

June 2015

Topic	Update
Internal Reporting	Providing internal reports analyzing active risk being taken by our public market (stocks and bonds) managers.
Specialized Risk Analysis	Applying and further developing specialized risk analysis solutions for Alternative Asset Class investments
Performance Attribution	Performance Attribution allows us to better distinguish manager skill from luck by breaking down (attributing) monthly return to specific manager decisions. Presented implemented analytics and reports for Active Equity and Fixed Income portfolios in August. Expect to start providing regular monthly analytics beginning in September.
Security Level Data Management	A daily security level portfolio data management solution is necessary to support risk and performance analytics. Have implemented the initial version. Currently being used to provide daily holdings and transaction data to the performance attribution system.
Performance Reporting	Expanding Performance Reporting procedures and methodology to incorporate new asset types, new investment vehicles, and increased transparency. Assessing a move from monthly close of portfolio accounting books by our custodian to a daily close and adding un-lagged performance reporting which shows returns for all accounts properly aligned with the time periods when they were earned ¹ .
Quantitative Portfolio Analysis	Monitoring advances in quantitative portfolio analysis to ensure that risk and performance analysis remain current at TMRS

1. Private market asset classes, like Real Estate, are priced quarterly with a quarter lag due to use of appraised value pricing in the absence of market prices. For some asset class funds in less liquid public markets this is also true, although to a lesser extent and the lag is only one month



QUESTIONS?