



LACERS
LOS ANGELES CITY EMPLOYEES'
RETIREMENT SYSTEM

Asset Allocation & Investment Management Process

Presenter:

Bryan Fujita
Chief Operating Officer, Investment Division

November 14, 2019

Agenda

- 1. LACERS Overview**
- 2. Asset Allocation Process**
- 3. Portfolio Construction & Implementation**
- 4. Putting it all Together**
- 5. LACERS Portfolio**

Credits

- The following companies/individuals were instrumental in providing investment material for this presentation:
 - Meketa Investment Group
 - NEPC, LLC
 - LACERS Investment Staff / LACERA Investment Staff
 - Other firms as noted on the slides
- Modifications were made by the presenter, who accepts full responsibility for any errors or omissions.

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Past performance does not guarantee of future results.



LACERS Overview

LACERS Highlights

**\$17.7
BILLION**
FUND ASSETS
JUNE 30, 2019

7.9%
FUND RETURN
AVERAGE
LAST 15 YRS
NET OF FEES

26,042
ACTIVE MEMBERS



19,379
RETIRES & BENEFICIARIES



AVERAGE MONTHLY

PENSION

\$4,326
SERVICE

\$1,714
DISABILITY

\$2,236
SURVIVOR

HEALTH SUBSIDIES

\$1,791
MAX NON-MEDICARE

\$1,121
AVERAGE NON-MEDICARE

\$490
AVERAGE MEDICARE



STATISTICS FROM FISCAL YEAR ENDED 2018 UNLESS OTHERWISE STATED

LACERS Mission Statement

OUR MISSION

*To protect and grow our trust fund
and to ensure the sustainable delivery
of ethical, reliable, and efficient
retirement services to our Members*

LACERS Investment Governance Structure



The Board

- Sets and monitors asset allocation
- Approves investment policy statement
- Selects consultants and investment managers
- Oversees investment management structure



Staff

- Guides the Board in making investment decisions
- Carries out the daily activities of managing the investment portfolio



Consultants

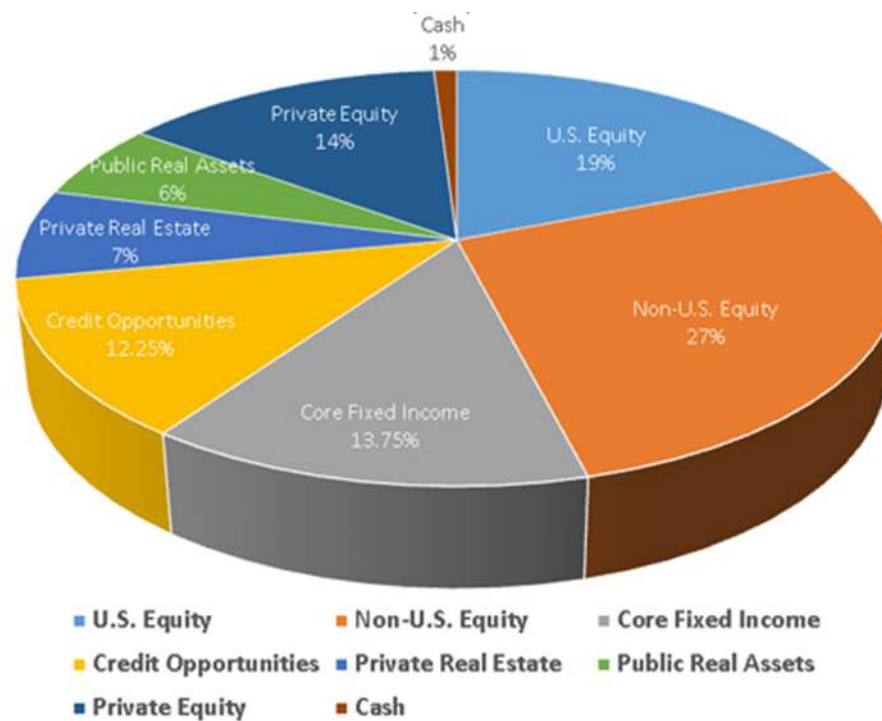
- Assists the Board and Staff with investment analysis and decisions
- General Fund Consultant: NEPC
- Private Equity Consultant: TorreyCove Capital Partners
- Real Estate Consultant: Townsend Group



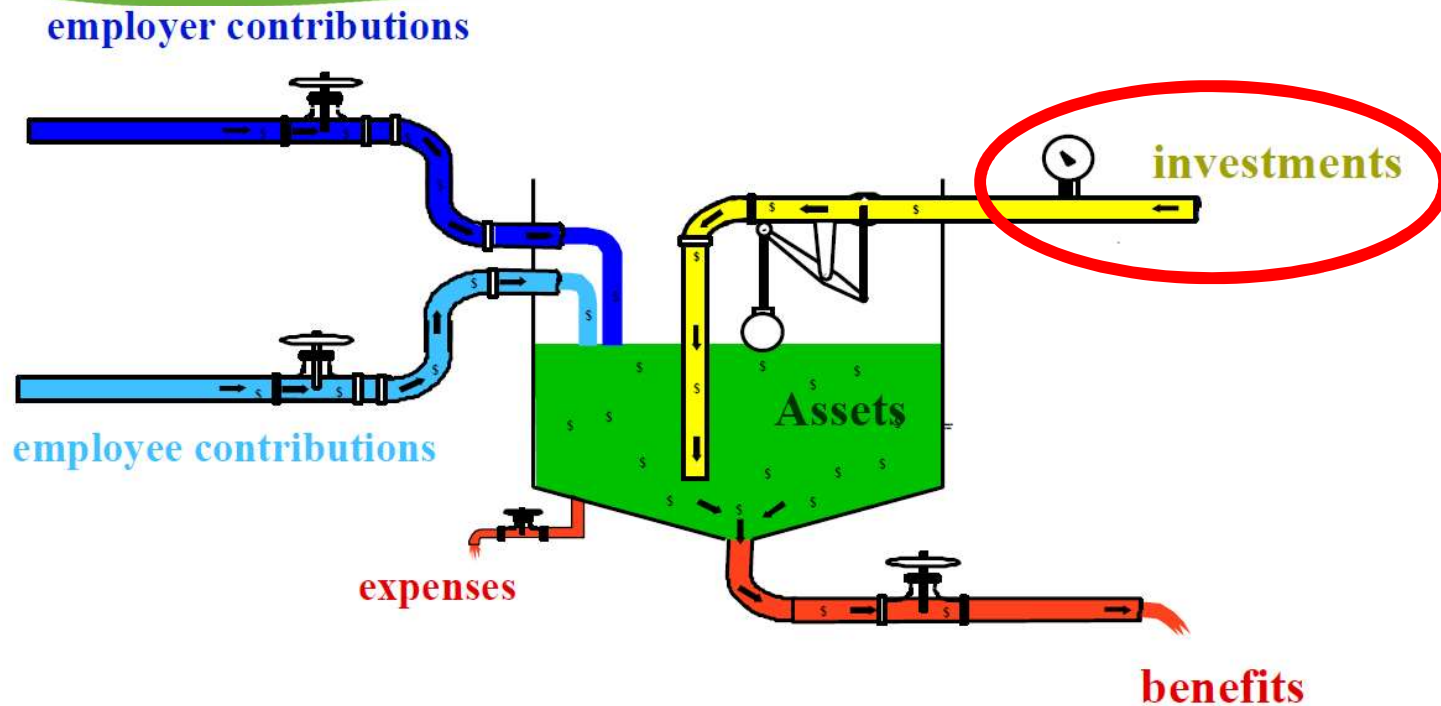
Investment Managers

- Fund assets are invested through external investment managers who have been selected by the Board and Staff for their expert knowledge of particular sectors of the market.
- Approximately 175 external managers across 6 general asset classes

Asset Allocation Process



The Fundamental Equation: $C + I = B + E$



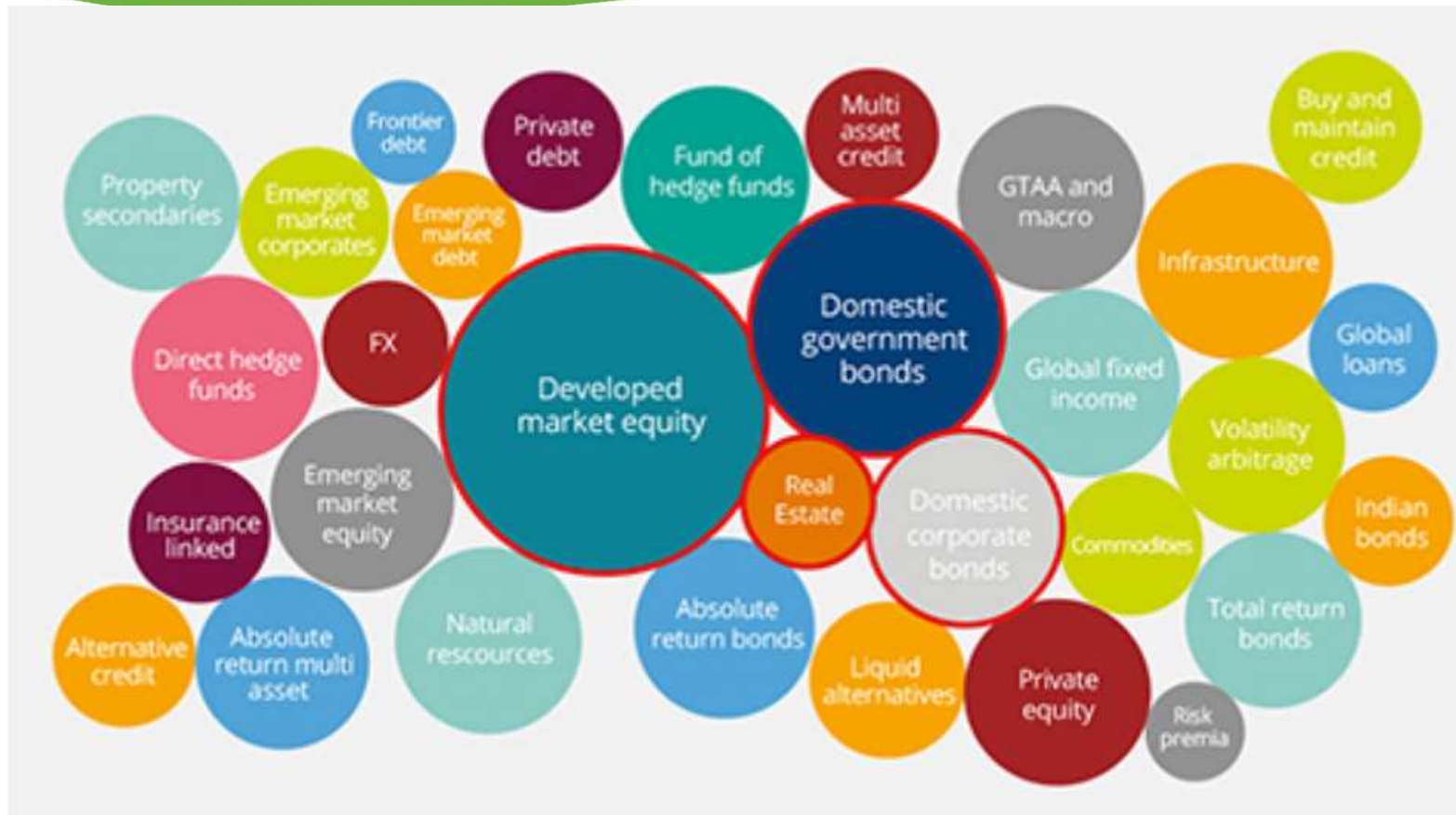
Ultimately:

$$\begin{aligned} &\text{Contributions} + \text{Investment Earnings} \\ &= \text{Benefit Payments} + \text{Expenses} \end{aligned}$$

Determining the Return on I

- $I = B + E - C$
- The assumed return on investments is determined by an actuarial study that examines factors such as:
 - Plan population size and projected growth
 - Retirement and mortality rates
 - Wage and healthcare inflation
 - Capital markets assumptions
- To ***sustain delivery of benefits***, LACERS Board has adopted a long-term return assumption of 7.25%

The Buffet of Investment Options



Source: Aberdeen Asset Management

How do we choose from the options?

Investments and Retirement Planning

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www.glasbergen.com



**“Okay, this time we’ll try it *your* way: 3% in stocks,
2% in bonds and 95% in lottery tickets.”**

Warren's One Choice Buffet

The S&P 500 Index has returned 11.8% annualized since 1942

*If my \$114.75 had been invested in a no-fee S&P 500 index fund (in 1942), and all dividends had been reinvested, my stake would have grown to be worth (pre-taxes) \$606,811 on January 31, 2019. That is a gain of 5,288 for 1 (11.8% annualized return). Meanwhile, a **\$1 million investment** by a tax-free institution such as a pension fund or college endowment would have grown to about **\$5.3 billion**.*

Berkshire Hathaway Inc. (2019). 2018 Letter to Shareholders.

But, you can't eat percentages...

**Liquidity for Short
Term Benefit
Payments**

**Long Term Returns
to Fund Future
Benefits**

What is Asset Allocation?

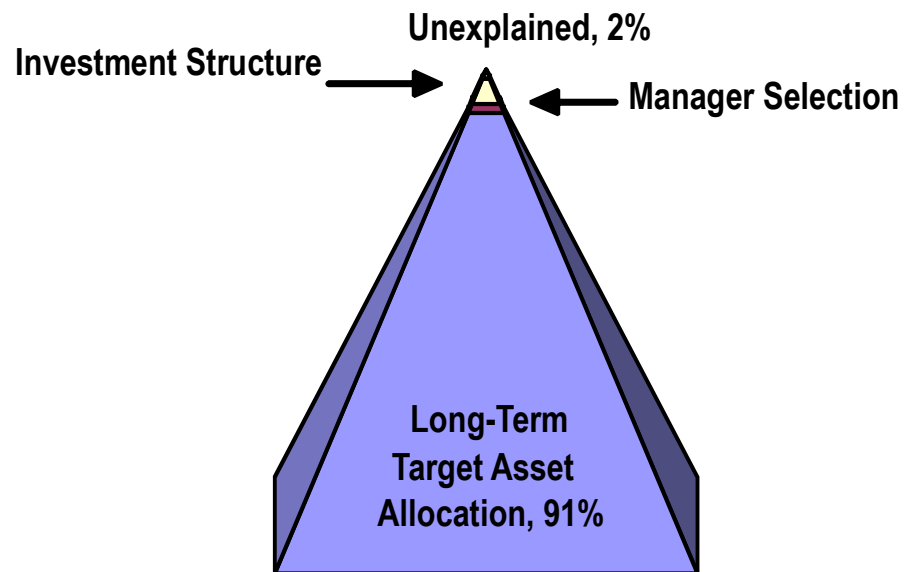
- Refers to the distribution of assets across a number of asset classes that exhibit modest or low correlations with each other
 - Goal: reduce risk, while maximizing return
- Primary driver of long-term return and risk for an investment pool
 - Each asset class exhibits unique **risk** and **return** behavior, with varying **correlation** to other asset classes
- Can create a multi-asset portfolio tailored to a unique set of objectives

Assets Behave Differently Over Time

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
US Large Cap 28.6%	Emerging Market Equity 66.4%	Real Estate 12.2%	US Fixed Income 8.4%	US Fixed Income 10.3%	Emerging Market Equity 55.8%	Emerging Market Equity 25.6%	Emerging Market Equity 34.0%	Emerging Market Equity 32.2%	Emerging Market Equity 39.4%	US Fixed Income 5.2%	Emerging Market Equity 78.5%	Emerging Market Equity 18.9%	Real Estate 14.3%	Emerging Market Equity 18.2%	US Large Cap 32.4%	US Large Cap 13.7%	Real Estate 13.3%	US Large Cap 12.0%	Emerging Market Equity 37.3%	Real Estate 6.7%
Non-U.S. Equity 20.0%	Non-U.S. Equity 27.0%	US Fixed Income 11.6%	Real Estate 7.3%	Real Estate 6.7%	Non-U.S. Equity 38.6%	Non-U.S. Equity 20.3%	Real Estate 20.1%	Non-U.S. Equity 26.3%	Real Estate 15.8%	Cash 1.4%	Non-U.S. Equity 31.8%	US Large Cap 15.1%	US Fixed Income 7.8%	Non-U.S. Equity 17.3%	Non-U.S. Equity 22.8%	Real Estate 11.8%	US Large Cap 1.4%	Emerging Market Equity 11.2%	Non-U.S. Equity 25.0%	Cash 1.9%
Real Estate 16.2%	US Large Cap 21.0%	Cash 6.0%	Cash 3.4%	Cash 1.6%	US Large Cap 28.7%	Real Estate 14.5%	Non-U.S. Equity 13.5%	Real Estate 16.6%	Non-U.S. Equity 11.2%	Real Estate (6.5%)	US Large Cap 26.5%	Real Estate 13.1%	US Large Cap 2.1%	US Large Cap 16.0%	Real Estate 11.0%	US Fixed Income 6.0%	US Fixed Income 0.5%	Real Estate 8.0%	US Large Cap 21.8%	US Fixed Income 0.0%
US Fixed Income 8.7%	Real Estate 11.4%	US Large Cap (9.1%)	Emerging Market Equity (2.6%)	Emerging Market Equity (6.2%)	Real Estate 9.0%	US Large Cap 10.9%	US Large Cap 4.9%	US Large Cap 15.8%	US Fixed Income 7.0%	US Large Cap (37.0%)	US Fixed Income 5.9%	Non-U.S. Equity 7.8%	Cash 0.0%	Real Estate 10.5%	Cash 0.1%	Cash 0.0%	Cash 0.0%	Non-U.S. Equity 1.0%	Real Estate 7.0%	US Large Cap (4.4%)
Cash 4.9%	Cash 4.7%	Non-U.S. Equity (14.2%)	US Large Cap (11.9%)	Non-U.S. Equity (15.9%)	US Fixed Income 4.1%	US Fixed Income 4.3%	Cash 3.2%	Cash 5.0%	US Large Cap 5.5%	Non-U.S. Equity (43.4%)	Cash 0.1%	US Fixed Income 6.5%	Non-U.S. Equity (12.1%)	US Fixed Income 4.2%	US Fixed Income (2.0%)	Emerging Market Equity (2.2%)	Non-U.S. Equity (0.08%)	US Fixed Income 2.6%	US Fixed Income 3.5%	Non-U.S. Equity (13.8%)
Emerging Market Equity (25.3%)	US Fixed Income (0.8%)	Emerging Market Equity (30.6%)	Non-U.S. Equity (21.4%)	US Large Cap (22.1%)	Cash 1.0%	Cash 1.4%	US Fixed Income 2.4%	US Fixed Income 4.3%	Cash 4.4%	Emerging Market Equity (53.3%)	Real Estate (16.9%)	Cash 0.1%	Emerging Market Equity (18.4%)	Cash 0.1%	Emerging Market Equity (2.6%)	Non-U.S. Equity (4.9%)	Emerging Market Equity (14.9%)	Cash 0.3%	Cash 0.9%	Emerging Market Equity (14.6%)

Source: NEPC, LLC

Asset Allocation – The Most Important Decision



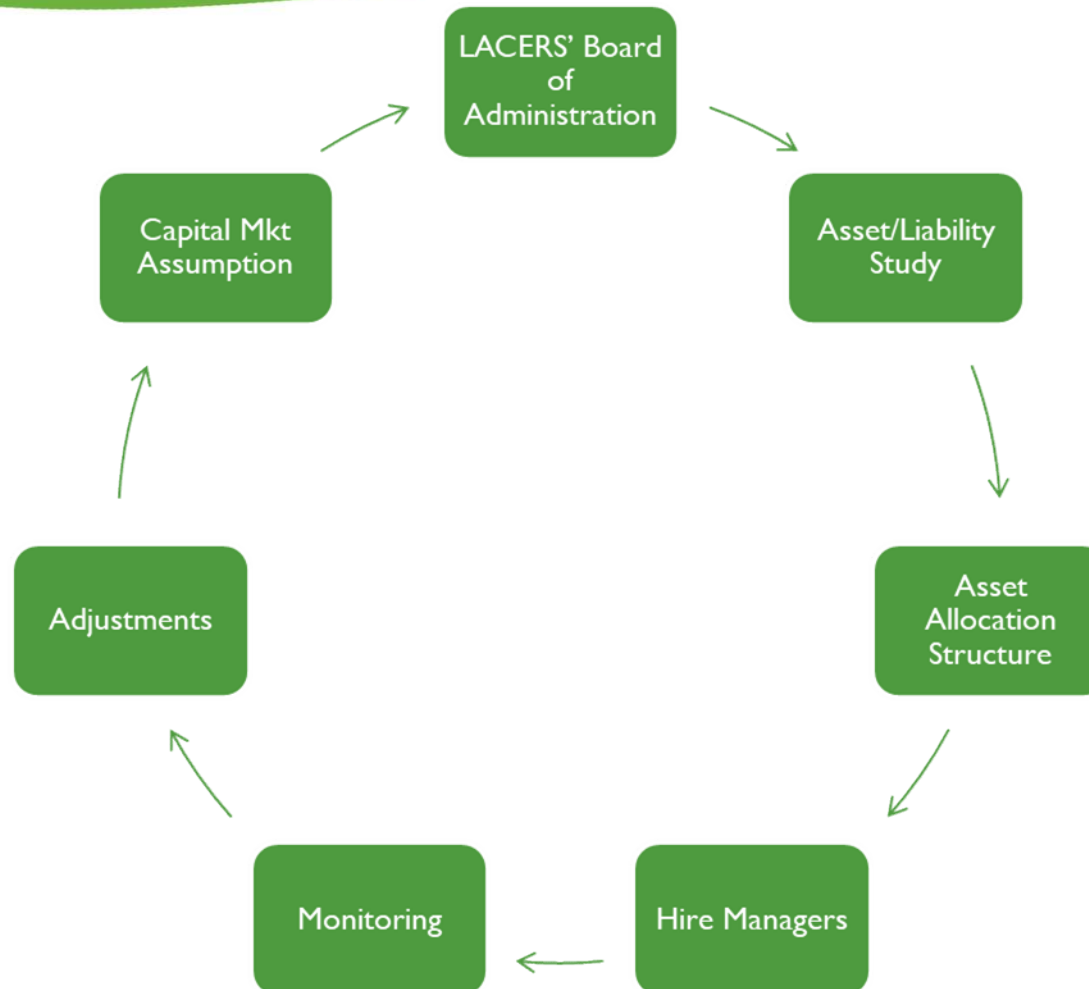
- Long-term asset allocation explains more than 90% of the difference in returns between institutional funds
- The actual percentage impact on returns is debatable, yet the primacy of asset allocation stands

Source: Brinson, Singer and Beebower, "Determinants of Portfolio Performance II: An Update" 1991.

Factors Driving Asset Allocation Decisions

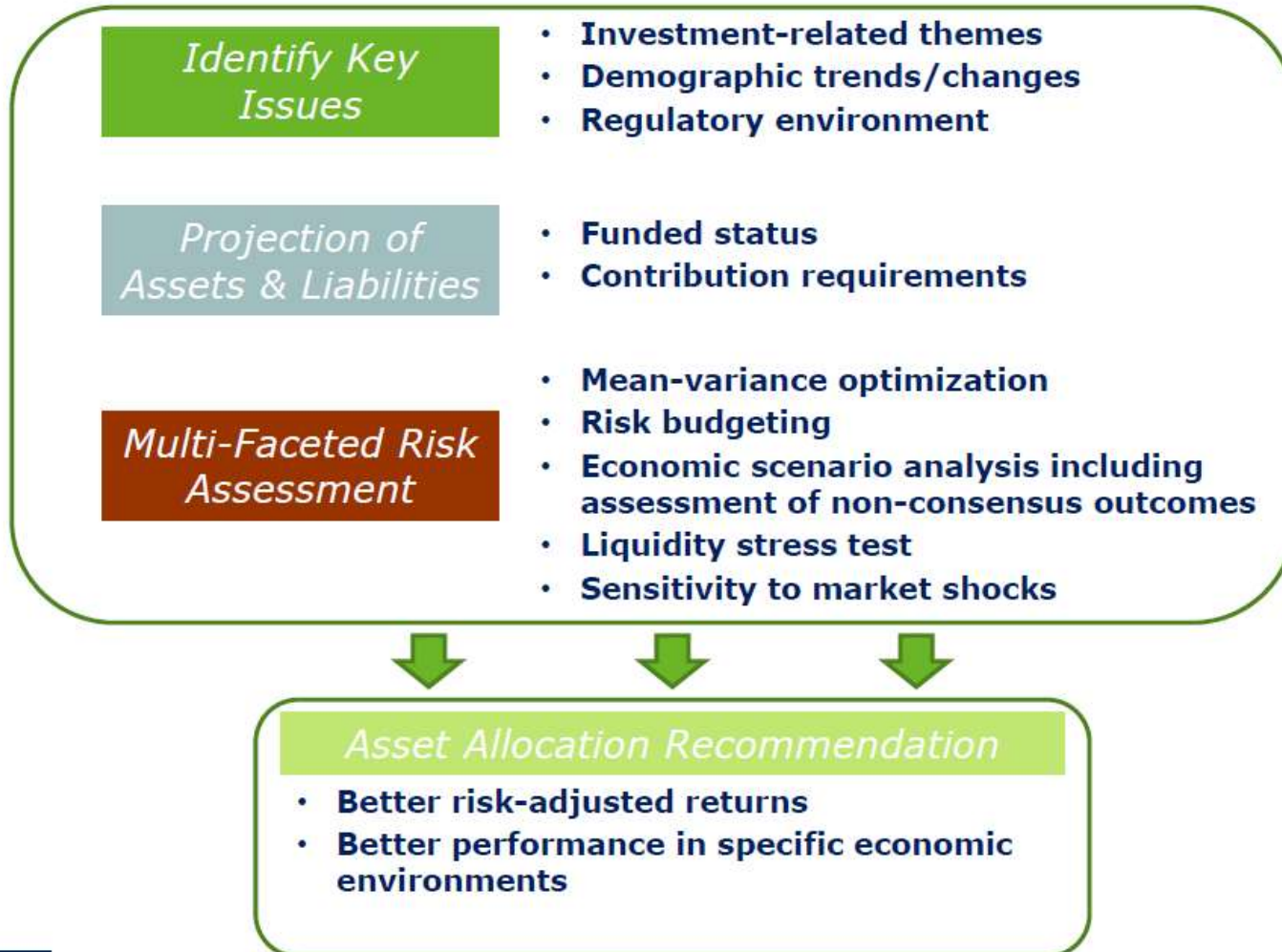
Return Requirements	<ul style="list-style-type: none"> • Minimum return required to meet investment goals
Risk Tolerance	<ul style="list-style-type: none"> • Ability to tolerate losses • Asset/liability matching (pensions) • Bond covenants may limit losses
Investment Horizon	<ul style="list-style-type: none"> • Longer horizons allow for more risk taking • Longer horizons allow for more private assets
Liquidity Requirements	<ul style="list-style-type: none"> • High liquidity requirements reduce risk taking • High liquidity requirements reduce private asset investments • Rating agencies may require more liquid/high quality assets
Regulatory Requirements	<ul style="list-style-type: none"> • Government statutes may limit investments in certain asset classes, for public entities
Taxes	<ul style="list-style-type: none"> • Taxable entities will gravitate toward tax-exempt assets

Investment Circle of Life



LACERS Approach to Asset Allocation

ASSET LIABILITY FRAMEWORK



MVO Input - Return and Risk Assumptions

5-7 YEAR RETURN ASSUMPTIONS

	Asset Class	5-7 Year Return	Change 2018-2017	Volatility
	Cash	2.00%	+.25%	1.00%
	US Inflation	2.50%	-	-
Equity	Large Cap Equities	5.25%	-.50%	17.50%
	International Equities (Unhedged)	7.50%	+.25%	21.00%
	Emerging International Equities	9.00%	-.50%	28.00%
	Private Equity	8.00%	-.25%	23.00%
Rates/Credit	Treasuries	2.25%	+.25%	5.50%
	Core Bonds	2.75%	+.10%	5.99%
	Municipal Bonds 1-10 Year	2.50%	-	5.50%
	High Yield Bonds	3.75%	-1.00%	13.00%
	Private Debt	6.50%	-.75%	13.00%
Real Assets	Commodities	4.75%	-	19.00%
	REITs	6.50%	-	21.00%
	Core Real Estate	5.75%	-.25%	13.00%
Multi-Asset	US 60/40*	4.54%	-.24%	10.99%
	Global 60/40*	4.91%	-.13%	11.78%
	Hedge Funds*	5.83%	-.10%	9.07%

*Each calculated as a blend of other asset classes.



MVO Input - Correlation Assumptions

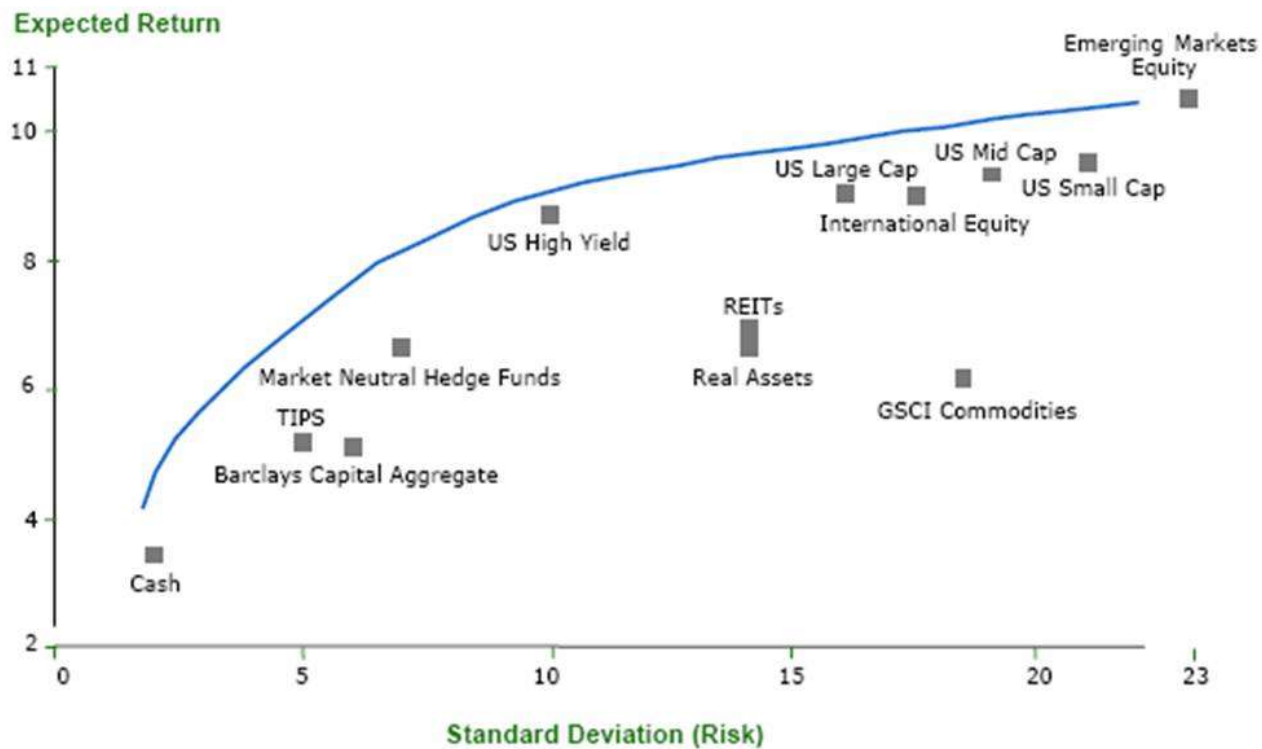
Actual Asset Class Correlations

	Large Cap Equities	International Equities	Emerging Market Equities	Real Estate	US Bonds	High Yield Bonds	Cash
Large Cap Equities	1.00						
International Equities	0.73	1.00					
Emerging Market Equities	0.68	0.70	1.00				
Real Estate	0.54	0.44	0.42	1.00			
US Bonds	0.11	0.08	0.03	0.20	1.00		
High Yield Bonds	0.61	0.55	0.58	0.58	0.22	1.00	
Cash	0.03	-0.03	0.01	-0.05	0.22	-0.05	1.00

Note: Correlations of assets class based on actual index results from January 1988- September 2019. MSCI EM begins January 1988.

Based on correlations of the following indices: Russell 1000, MSCI EAFE, MSCI EM, FTSE/NAREIT All REITS, Bloomberg BC US Aggregate Bond, Bloomberg BC US Corp. High Yield, BofAML US 3-Month Treasury Bill

MVO Output - Efficient Frontier Chart



- The efficient frontier represents the opportunity set of portfolios that deliver the highest return for a given level of risk

MVO Output - Efficient Frontier Table

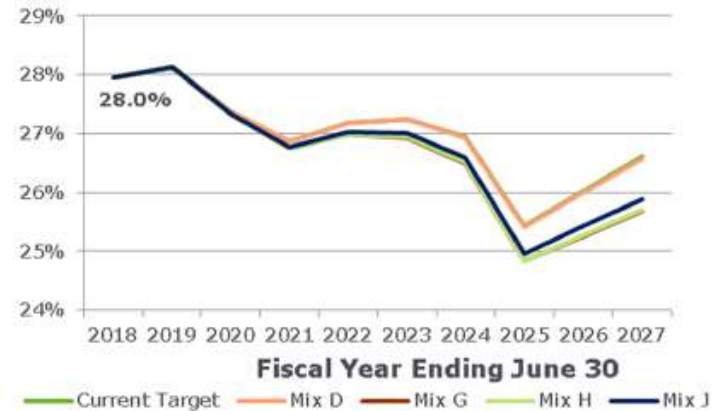
	Current Target	Mix D	Mix G	Mix H	Mix J
US Equities	24.0%	19.0%	13.0%	22.0%	19.0%
Non US Equities	29.0%	24.0%	21.0%	27.0%	27.0%
Private Equity	12.0%	12.0%	12.0%	14.0%	14.0%
Total Equity	65.0%	55.0%	46.0%	63.0%	60.0%
Core Fixed Income	19.0%	17.0%	10.0%	12.8%	13.8%
Credit Opportunities	5.0%	15.0%	15.0%	11.3%	12.3%
Total Fixed Income	24.0%	32.0%	25.0%	24.0%	26.0%
Public Real Assets	5.0%	5.0%	5.0%	5.0%	6.0%
Real Estate	5.0%	7.0%	8.0%	7.0%	7.0%
Private Real Assets	0.0%	0.0%	4.0%	0.0%	0.0%
Total Real Assets	10.0%	12.0%	17.0%	12.0%	13.0%
Cash	1.0%	1.0%	1.0%	1.0%	1.0%
Global Asset Allocation	0.0%	0.0%	4.0%	0.0%	0.0%
Risk Parity	0.0%	0.0%	3.0%	0.0%	0.0%
Hedge Funds	0.0%	0.0%	4.0%	0.0%	0.0%
Total Multi Asset	0.0%	0.0%	11.0%	0.0%	0.0%
Expected Return 5-7 yrs	6.39%	6.40%	6.63%	6.62%	6.57%
Expected Return 30 yrs	7.57%	7.53%	7.64%	7.78%	7.70%
Standard Dev	13.21%	12.51%	12.51%	13.51%	13.13%
Sharpe Ratio (5-7 yrs)	0.33	0.35	0.37	0.34	0.35
Sharpe Ratio (30 yrs)	0.37	0.38	0.39	0.37	0.38
Total Plan Fee (bps)	47.1	55.7	74.0	57.3	57.9
% Private Markets	17.00%	24.00%	29.00%	24.75%	24.75%

Stress Testing Portfolio Risk & Liquidity

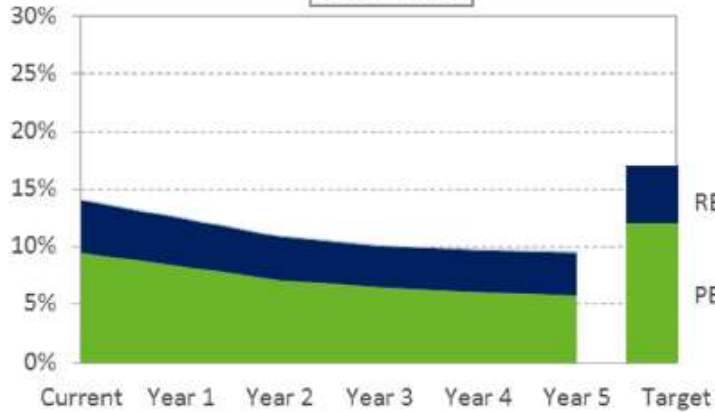
Funded Ratio



Employer Contribution Rates (% of Payroll)



Liquidity Base Case



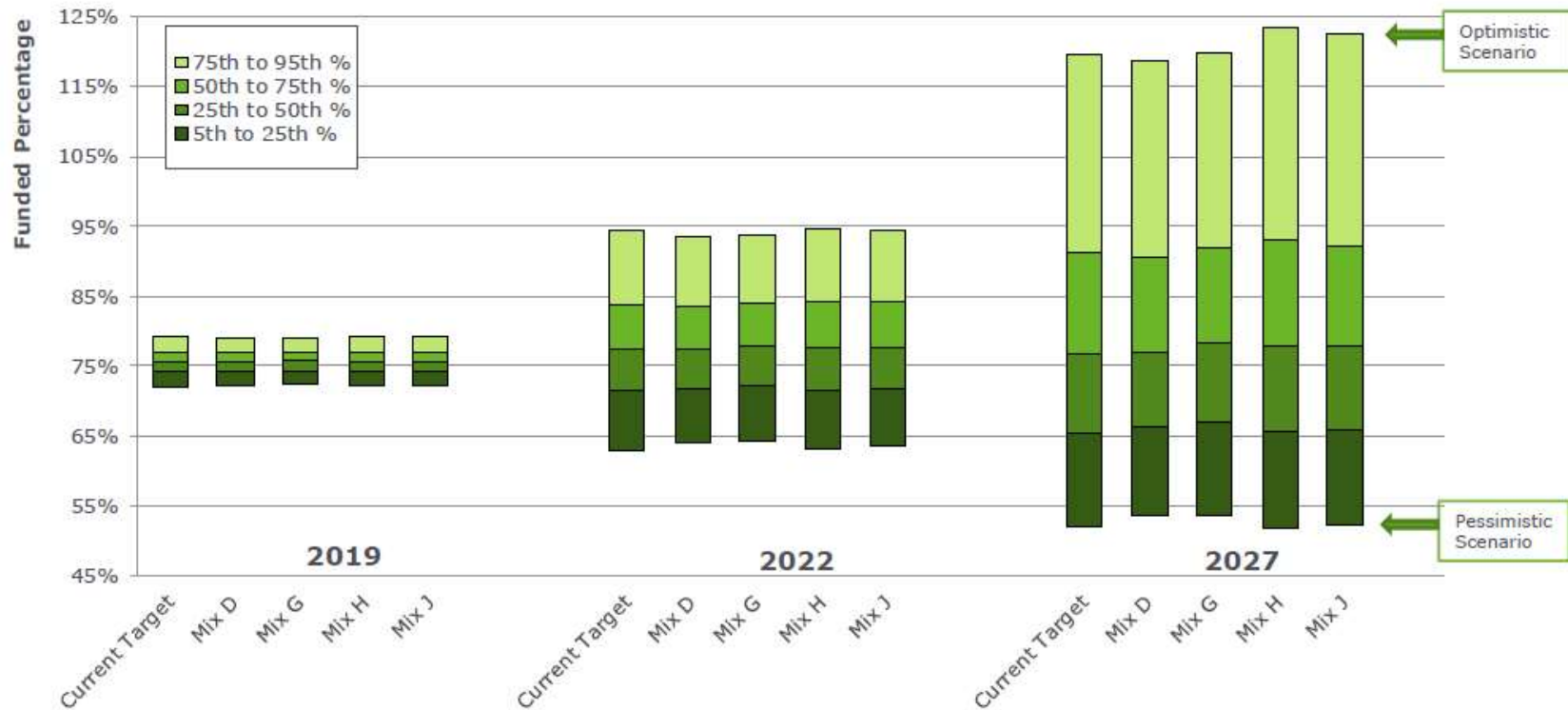
Liquidity Stressed Case



Dark blue real estate allocation include 3% core real estate and 2% non-core real estate target

Stress Testing Portfolio Risk & Liquidity (cont.)

LACERS FUNDED RATIO PROJECTIONS



- Median funded ratio highest for Mix G and Mix J, while the range of outcomes is smallest for Mix D
- In 2027, funded ratio could range from 66% to 92% on a 25/75% confidence level

Asset Allocation is not “set it and forget it”

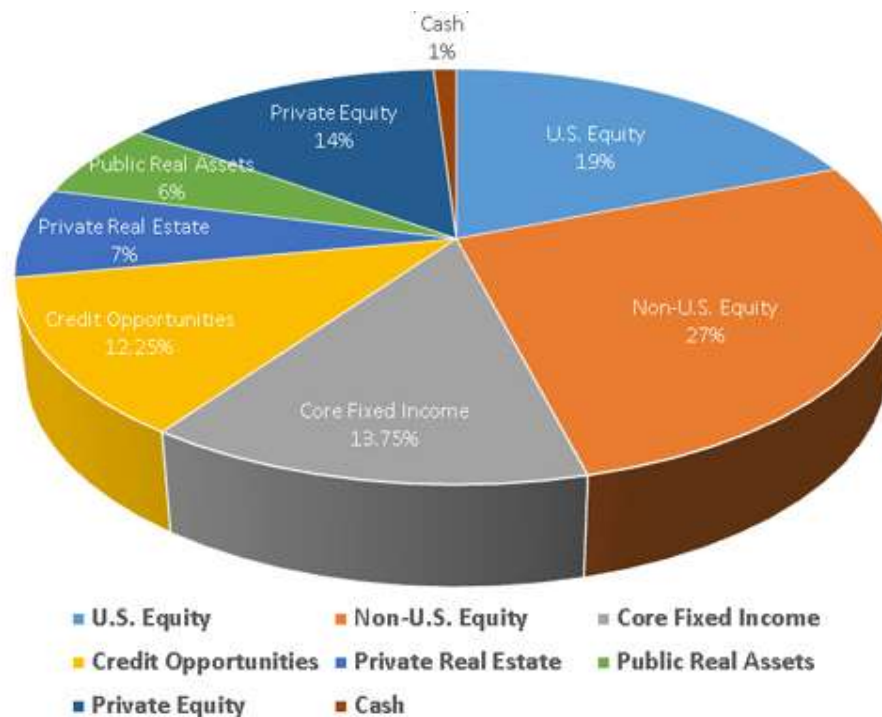
Decline in Expected 5-7 Year Investment Returns



Source: Wilshire Consulting 2016

Source: NEPC, October 2, 2019

Portfolio Construction & Implementation



How do we fill the asset class buckets?

U.S. Stock	1 year gross return	1 year net return	U.S. Stock	5 year gross return	5 year net return
Granahan Inv Mgt - Sm Cap Focused Grth	32.47	31.28	Kayne Anderson Rudnick SC Sustain Growth	23.56	22.36
Elemental Capital Small and Mid-Cap Gr	33.65	31.12	Granahan Inv Mgt - Sm Cap Focused Grth	22.90	22.10
Morgan Stanley Discovery	30.61	29.58	J.P. Morgan US Technology Leaders - MA	21.02	20.57
Salient MLP High Conviction	2.32	27.55	RS Science And Technology Composite	21.25	20.05
Atlanta High Quality Focused Growth	27.50	26.63	Morgan Stanley Insight	20.86	19.70
Morgan Stanley Insight	26.97	25.78	Columbia Global Technology Growth	20.56	19.39
Atlanta High Quality Calvert Equity	26.33	25.35	Peregrine Capital Mgt Large Cap Growth	19.84	19.34
Commerce Large-cap Growth	17.25	25.27			

Source: Morningstar Separate Account/CIT Fund Database

Portfolio Construction & Implementation

- Build the Investment Structure
 - Once asset allocation is determined, need to select investment managers and strategies for each asset class
- Develop Risk Budgets (Public Markets Asset Classes Only)
 - Primary consideration is risk of expected excess returns achievable by individual strategies relative to the asset class benchmark (tracking error)
- Optimize Each Asset Class (Public Markets Asset Classes Only)
 - Mean-variance optimization based on risk budgets

Factors Contributing to Tracking Error

Example:

- U.S. Equities asset class is benchmarked to the Russell 3000 Index

- Levers to increase or decrease tracking error include:
 - Capitalization – large, mid, small
 - Style – core, growth, value
 - Sectors – industrials, health care, info tech, etc.
 - Active vs. Passive Management

Investment Manager Strategies & Styles

Manager Selection

- Two categories: qualitative and quantitative
 - Qualitative factors relate to organizational or strategic changes, while quantitative factors relate to performance and explicit costs
- Qualitative factors:
 - Investment strategy
 - Investment process
 - Investment resources
- Quantitative factors:
 - Investment performance
 - Investment fees

Investment Manager Strategies & Styles

Monitoring and Evaluating Manager Performance

- Absolute performance
 - Example: “manager A” returns 10%
- Relative performance
 - Manager performance as compared with stated benchmark index
- Risk-adjusted performance
 - *Sharpe ratio*:
 - measure of excess return (relative to the risk-free rate) per unit of risk
 - tells investors whether a portfolio's returns are due to smart investment decisions or simply a result of excess risk taking
 - the greater a portfolio's Sharpe ratio, the better its risk-adjusted performance
 - *Information ratio*:
 - measure of consistency of a manager's excess returns (relative to its benchmark)
 - the higher the Information ratio, the more consistent the manager's results

Putting it all Together

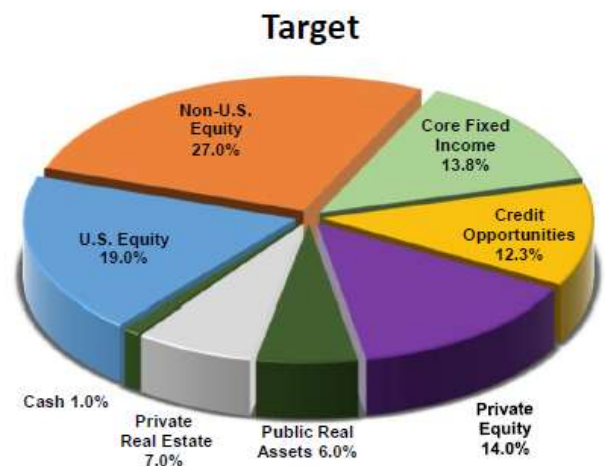
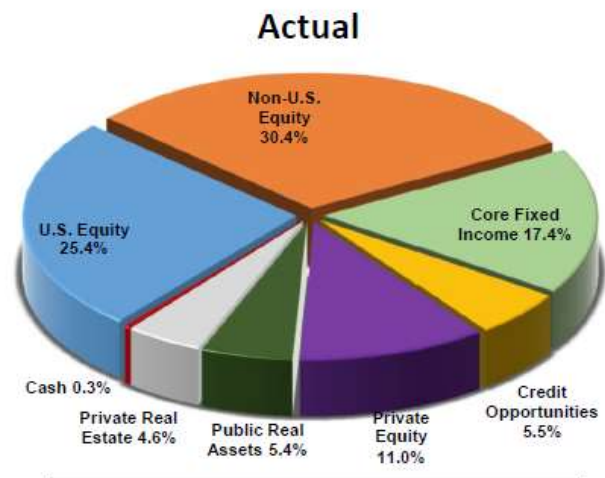
- ✓ Develop a clear, long-term plan
- ✓ Balance between tolerance for risk and need for return
- ✓ Manage liquidity to meet needs
- ✓ Diversify
- ✓ Be mindful of fees (benefits are paid with net returns)
- ✓ Revisit asset allocation periodically (approximately every three years)

LACERS Portfolio as of 6/30/19

LACERS Investment Portfolio

ASSET CLASS BY MARKET VALUE & ALLOCATION						
Asset Class	as of ► June 30, 2019					
	Actual (\$ B)	Actual (%)	Target (%)	Actual-Target*	Min (%)	Max (%)
U.S. Equity	4.50	25.4%	19.0%	6.4%	12.0%	26.0%
Non-U.S. Equity	5.38	30.4%	27.0%	3.4%	18.0%	36.0%
Core Fixed Income	3.07	17.4%	13.8%	3.6%	10.8%	16.8%
Credit Opportunities	0.97	5.5%	12.3%	-6.8%	8.3%	16.3%
Private Equity	1.95	11.0%	14.0%	-3.0%	N/A	N/A
Public Real Assets	0.96	5.4%	6.0%	-0.6%	4.0%	8.0%
Private Real Estate	0.81	4.6%	7.0%	-2.4%	N/A	N/A
Cash	0.06	0.3%	1.0%	-0.7%	0.0%	2.0%
TOTAL FUND	17.69	100.0%	100.0%	0.0%	N/A	N/A

*Current asset allocation targets approved in April 2018. Transition to new targets in progress.



LACERS Portfolio as of 6/30/19

TOTAL FUND PERFORMANCE DETAIL (NET)

	Market Value (\$)	% of Portfolio	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)
LACERS Master Trust	17,693,115,347	100.00	3.46	11.45	5.96	9.32	6.11	9.70
Policy Index			<u>3.48</u>	<u>13.07</u>	<u>6.98</u>	<u>9.80</u>	<u>6.29</u>	<u>9.87</u>
Over/Under			-0.02	-1.62	-1.02	-0.48	-0.18	-0.17
U.S. Equity	4,500,423,779	25.44	4.23	18.79	8.18	14.00	10.04	14.50
U.S. Equity Blend			<u>4.10</u>	<u>18.71</u>	<u>8.98</u>	<u>14.02</u>	<u>10.19</u>	<u>14.67</u>
Over/Under			0.13	0.08	-0.80	-0.02	-0.15	-0.17
Non-U.S. Equity	5,382,051,196	30.42	3.06	13.91	0.02	9.60	2.94	7.47
MSCI ACWI ex USA			<u>2.98</u>	<u>13.60</u>	<u>1.29</u>	<u>9.39</u>	<u>2.16</u>	<u>6.54</u>
Over/Under			0.08	0.31	-1.27	0.21	0.78	0.93
Core Fixed Income	3,065,987,757	17.33	3.17	6.41	7.98	2.64	3.04	
Core Fixed Income Blend			<u>3.08</u>	<u>6.11</u>	<u>7.87</u>	<u>2.31</u>	<u>2.95</u>	
Over/Under			0.09	0.30	0.11	0.33	0.09	
Credit Opportunities	970,661,464	5.49	3.31	9.94	8.80	6.87	4.22	
Credit Opportunities Blend			<u>3.06</u>	<u>10.43</u>	<u>9.22</u>	<u>6.82</u>	<u>4.94</u>	
Over/Under			0.25	-0.49	-0.42	0.05	-0.72	
Real Assets	1,765,575,907	9.98	1.85	5.86	5.60	4.83	6.23	4.33
CPI + 5% (Unadjusted)			<u>2.00</u>	<u>4.46</u>	<u>6.72</u>	<u>7.14</u>	<u>6.52</u>	<u>6.81</u>
Over/Under			-0.15	1.40	-1.12	-2.31	-0.29	-2.48
Public Real Assets	956,213,312	5.40	2.21	8.23	4.33	1.86	1.58	
Public Real Assets Blend			<u>1.63</u>	<u>8.28</u>	<u>3.20</u>	<u>1.52</u>	<u>-0.47</u>	
Over/Under			0.58	-0.05	1.13	0.34	2.05	
Private Real Estate	788,737,712	4.46	1.37	3.22	7.05	7.67	9.30	5.83
Real Estate Blend			<u>1.19</u>	<u>2.83</u>	<u>7.25</u>	<u>8.43</u>	<u>10.63</u>	<u>10.34</u>
Over/Under			0.18	0.39	-0.20	-0.76	-1.33	-4.51
Private Equity	1,952,025,876	11.03	4.94	3.80	13.51	14.03	10.96	13.51
Private Equity Blend			<u>4.86</u>	<u>20.43</u>	<u>12.23</u>	<u>17.41</u>	<u>13.47</u>	<u>18.41</u>
Over/Under			0.08	-16.63	1.28	-3.38	-2.51	-4.90
Cash	56,389,368	0.32						



LACERS

LOS ANGELES CITY EMPLOYEES'
RETIREMENT SYSTEM

Questions?