Real Assets
Annual Program Review

November 13, 2017

Executive Summary – Real Assets Program Performance

As of June 30, 2017	NAV (millions)	1-Year Net Return	3-Year Net Return	5-Year Net Return	10-Year Net Return	20-Year Net Return
Real Assets	**$36,291**	**7.4%**	**8.6%**	**10.0%**	**-0.9%**	**7.0%**
Policy Index		7.0%	9.9%	10.2%	6.9%	9.8%
Excess Return		0.4%	-1.3%	-0.2%	-7.8%	-2.9%

Real Estate	**$30,536**	**7.6%**	**9.4%**	**10.8%**	**-1.3%**	**6.8%**
Policy Index		7.4%	10.8%	11.1%	7.8%	10.3%
Excess Return		0.2%	-1.4%	-0.3%	-9.1%	-3.5%
Infrastructure	**$3,775**	**9.9%**	**10.7%**	**12.0%**		
Policy Index		6.5%	5.1%	5.3%		
Excess Return		3.4%	5.6%	6.7%		
Forestland	**$1,980**	**1.0%**	**-3.1%**	**-0.1%**		
Policy Index		3.6%	5.7%	7.1%		
Excess Return		-2.7%	-8.7%	-7.3%		

Real Assets, Real Estate and Infrastructure all outperformed the 2013 ALM expected return of 7% for the 1-year and 5-year periods.

Executive Summary – Real Assets Program Performance

Role - Cash Yield

FY	1–Year Net Income Return	5–Year Net Income Return	RA Core Exposure
FY 16/17	3.3%	3.3%	75%
FY 15/16	3.7%	2.8%	65%
FY 14/15	3.6%	2.4%	46%
FY 13/14	3.4%	1.7%	42%
FY 12/13	2.6%	-0.4%	39%
FY 11/12	0.6%	-1.9%	38%

Role - Inflation Protection

FY	5-Year rolling Net Appreciation	5-Year rolling CPI
FY 16/17	6.5%	1.2%
FY 15/16	8.1%	1.3%
FY 14/15	9.1%	1.6%
FY 13/14	-0.5%	2.1%
FY 12/13	-8.7%	1.7%
FY 11/12	-8.6%	2.2%

Role of Real Assets

- Stable and predictable cash yield
- Inflation protection
- Diversification of equity risk

Role - Diversification of Equity

	Volatility 5-Year	Correlation 5-Year
Real Assets	4.7	-0.05
FTSE Global All Cap Custom Net	8.5	

Executive Summary – Portfolio Position

Program	Core vs. Non-Core*	1-Year Net Income Return	1-Year Net Valuation Change	Change in NAV (millions)	Current LTV	1-Year LTV Difference	Emerging Manager Commitment/NAV (in Million $)	
Real Assets	75% / 25%	3.3%	4.2%	4,454	32.9%	-0.4%	$600	$348
Real Estate	77% / 23%	3.6%	4.1%	3,240	31.4%	-0.9%	$600	$348
Infrastructure	70% / 30%	3.3%	6.7%	1,207	46.6%	-0.4%	N/A	N/A
Forestland	45% / 55%	-1.2%	2.2%	7	22.3%	-0.4%	N/A	N/A

- The manager count was reduced from 58 in 2015 to 30 in 2017 (excludes an additional 5 emerging managers).
- Real Assets Loan-To-Value (LTV) % was reduced from 39.6% in 2012 to 32.9% in 2017.
- 85% of Real Estate properties are stabilized. The stabilized life cycle is defined as having occupancy of 85% or greater.

*Core - Includes investments that produce a predictable current net income yield after debt service.

Executive Summary – FY 2016/17 Accomplishments

Initiatives	Accomplishments
Organization & Governance	Strategic Plan Update – Implementation • Completed the Residential and International Segment Plans • Completed Portfolio Hierarchy – Systems / Database • Completed Investment Policy Procedures Guidelines across all Real Assets • Completed Desktop Procedures Manual across all Real Assets • Established Investment Manager Sub-Committee as a deliberative body to RAIC
Portfolio Repositioning	• Fully realized Real Estate Secondary Sale • Reduced Real Assets LTV% • Improved Fixed/Floating debt ratio • Reduced External Manager Count • Increased Infrastructure exposures • Real Assets core exposure at 74.9% (Policy limit minimum 75%)
Alignment and Costs	Business Model • Implemented New Alignment Model providing greater alignment with Real Assets role and benchmark
Sustainable Investment – ESG	Energy Optimization Initiative • Hosted energy optimization roundtable which launched the initiative Sustainability Objectives • Added Real Estate to GRESB Sustainability Benchmark
RE Emerging & Transition Manager Program	RE Emerging Managers • Increased the dollars invested and the number of Emerging Managers

Executive Summary – FY 2017/18 Initiatives

Category	Initiatives
Organization & Governance	Strategic Plan Update – Implementation • Complete additional Segment planning effort Governance • Strengthen governance of logistics platform • Implement Assembly Bill 2833
Portfolio Repositioning	• Continue to enhance and strengthen portfolio • Continue to reduce External Manager count • Infrastructure Portfolio Construction Plan • Retail Study
Alignment and Costs	Business Model • New Alignment Model - Evaluate expanding new alignment model across additional partnerships (ongoing)
Sustainable Investment – ESG	Energy Optimization Initiative • Research, develop and assess energy optimization strategies Sustainability Objectives • Implement sustainability performance assessment and benchmarking tool across the Real Assets portfolio • Roll out Real Estate ESG Consideration Matrix for underwriting new assets
RE Emerging & Transition Manager Program	RE Emerging Managers • Demonstrate commitment through expansion effort • Evaluate additional Real Estate emerging managers RE Transition Managers • Evaluate/Define strategy and sector focus

Appendix

Review Outline

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1	Liabilities
2	Long-Term Horizon
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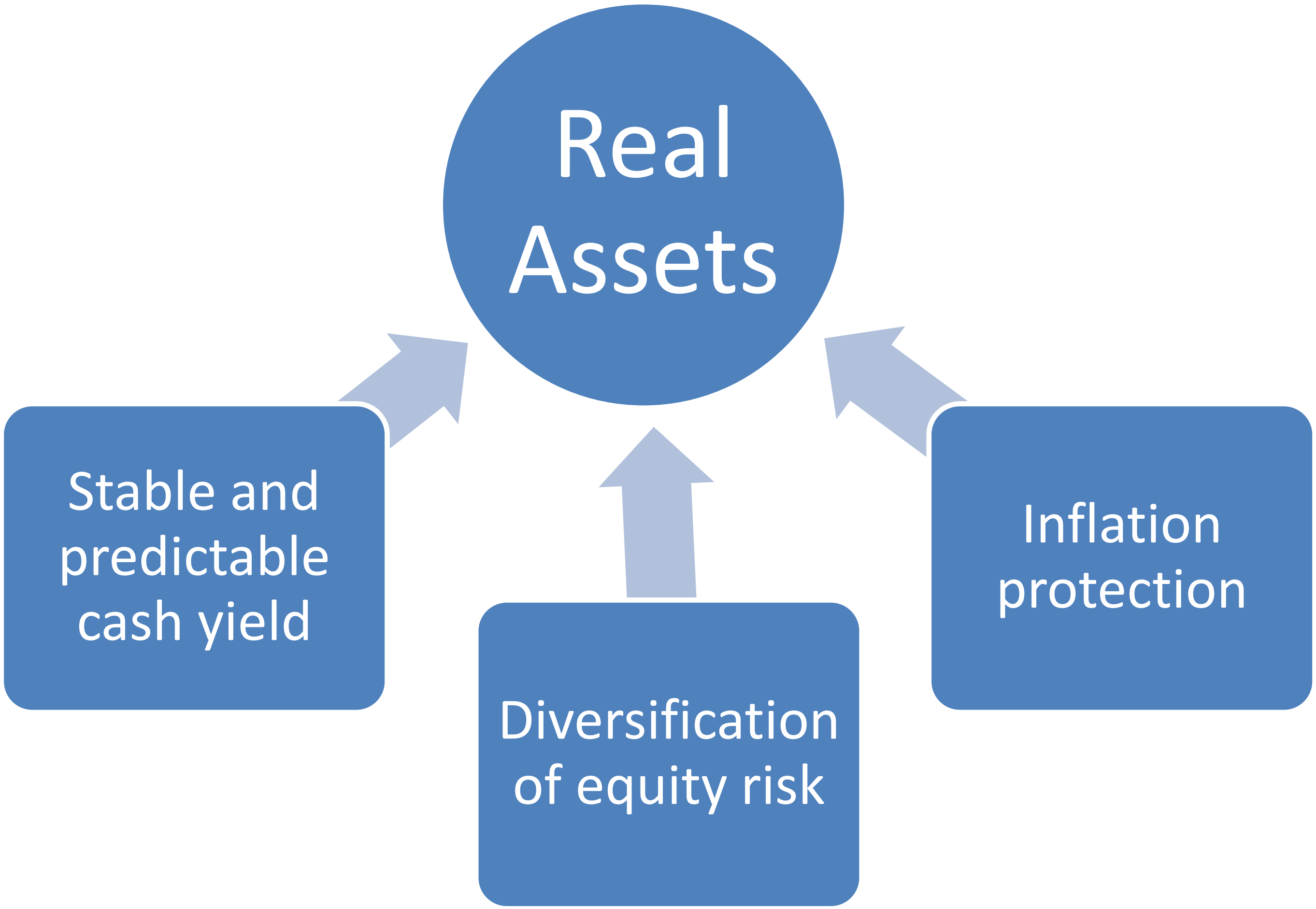
4	Three Forms of Capital
5	Accountability
6	Strategic Allocation
7	Risk Reward
8	Costs Matter
9	Multi-faceted Risk
10	Resources/Process

Investment Beliefs Key

	Short Name	Investment Belief
1	Liabilities	Liabilities must influence the asset structure.
2	Long-Term Horizon	A long time investment horizon is a responsibility and an advantage.
3	Stakeholders	CalPERS investment decisions may reflect wider stakeholder views.
4	Three Forms of Capital	Long-term value creation requires effective management of three forms of capital: financial, physical, and human.
5	Accountability	CalPERS must articulate its investment goals and performance measure and ensure clear accountability for their execution.
6	Strategic Allocation	Strategic asset allocation is the dominant determinant of portfolio risk and return.
7	Risk Reward	CalPERS will take risk only where we have a strong belief we will be rewarded.
8	Costs Matter	Costs matter and need to be effectively managed.
9	Multi-faceted Risk	Risk of CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error.
10	Resources / Process	Strong processes and teamwork and deep resources are needed to achieve CalPERS' goals and objectives.

I. Program Overview

Program Roles



Program Investment Philosophy

- Invest in high-quality, well located assets held through business cycles.
- Core assets with stable and predictable cash flows.
- Preference for separate accounts with highly reputable, market-leading managers.
- Strong governance with focus on economic alignment, transparency, and cost efficiency.
- Movement toward fewer and larger external manager relationships.
- Moderate leverage across the portfolio.
- Sustainable investment practices for selection, contracting, monitoring, and management of assets and managers.

Policy Benchmarks

Real Assets Policy Benchmark

- 84.6% Real Estate Benchmark
- 7.7% Infrastructure Benchmark
- 7.7% Forestland Benchmark

Real Estate Policy Benchmark

National Council of Real Estate Investment Fiduciaries Open-End Diversified Core Fund Index (NCREIF ODCE)

Infrastructure Policy Benchmark

Consumer Price Index (CPI) + 4% lagged one quarter

Forestland Policy Benchmark

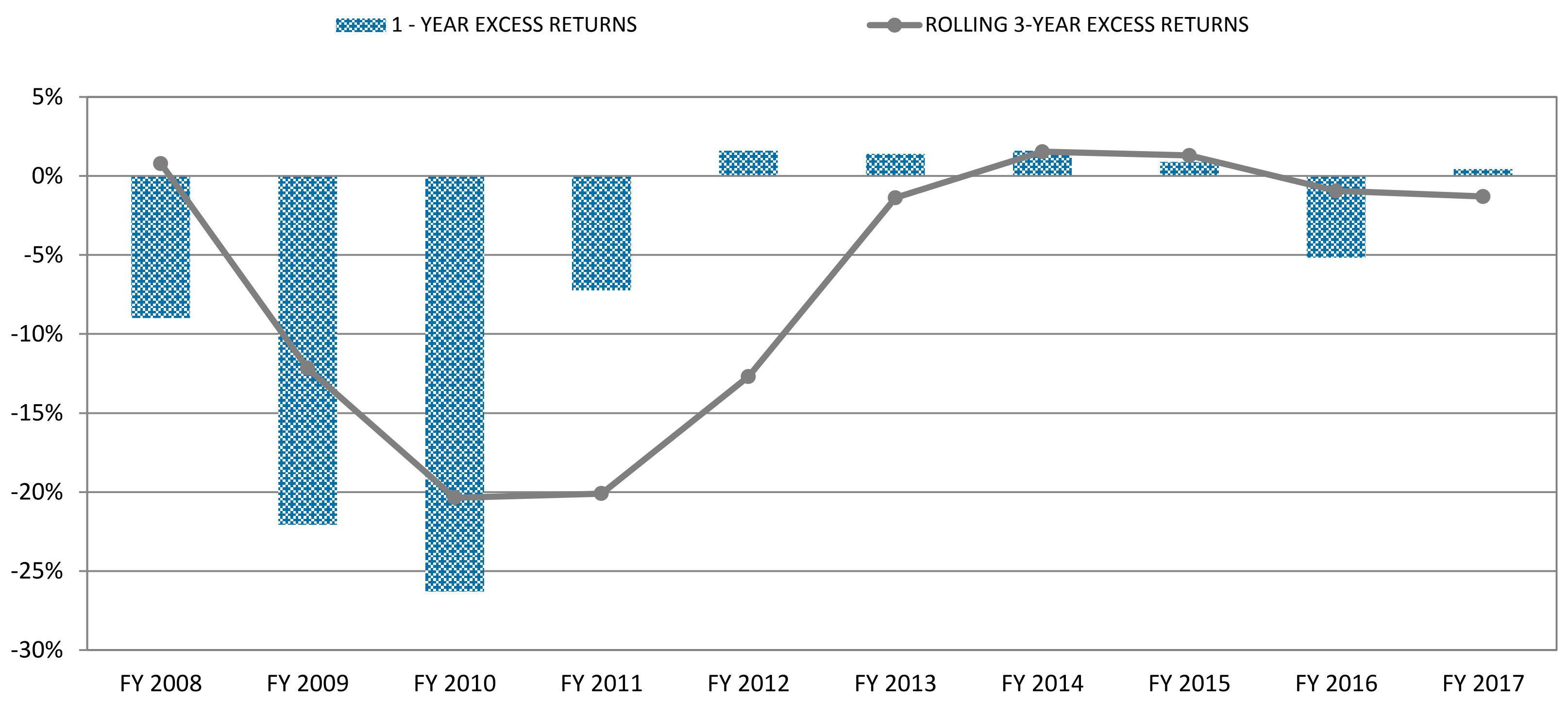
National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Index

Program Performance Review – Real Assets

As of June 30, 2017	1-Year Net Return	3-Year Net Return	5-Year Net Return	10-Year Net Return	20-Year Net Return
Real Assets	**7.4%**	**8.6%**	**10.0%**	**-0.9%**	**7.0%**
Policy Index	7.0%	9.9%	10.2%	6.9%	9.8%
Excess Return	0.4%	-1.3%	-0.2%	-7.8%	-2.9%

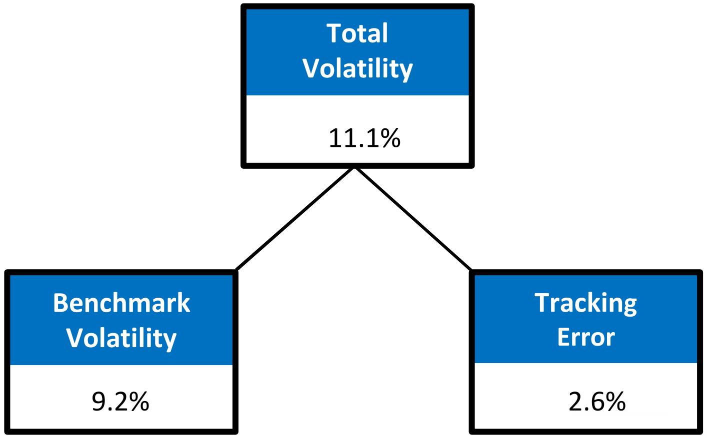
- Real Assets outperformed the 2013 ALM expected return of 7% for the 1-, 3-, and 5-year periods.

Performance: Real Assets 3-Year Rolling Excess Return



Volatility Profile – Real Assets

- Real Assets Forecast Volatility is 11.1%.
- Forecast Tracking Error is 2.6%.
- Forecast Correlation vs. the entire PERF portfolio is 0.77.



Source: MSCI BarraOne Risk System – Real Assets holdings data as of 3/31/17 and BarraOne Model information as of 6/30/17

Program Characteristics – Real Assets

- **Total Net Asset Value (NAV):** $36.3 billion.
  - Real Assets accounts for 11.2% of the Total Fund NAV.
  - The NAV increased 14% from $31.8 billion to $36.3 billion.
- **Unfunded:** $8.7 billion ($8.1 billion revocable or at CalPERS discretion)
- **Structure:**
  - 30 External Managers, one manager is in both Real Estate and Infrastructure.
  - 33 Separate Accounts, 20 Commingled Funds, 3 Direct Investments and 1 Operating Company.
    - NAV Basis: 75% Separate Accounts, 11% Commingled Funds, 3% Direct Investments, 11% Operating Company.
- **Geographic Exposure:**
  - 88% U.S. and 12% International.
  - 26% NAV invested in California.

Portfolio Positioning – Real Assets

Risk Classification	%Policy Range	%NAV	Policy Compliance
Core	75-100%	**74.9%**	✘
Value Add	0-25%	**11.3%**	✓
Opportunistic	0-25%	**13.8%**	✓
Development or Build-to-Core	0-10%	**6.8%**	✓

Geography	%Policy Range	%NAV	Policy Compliance
United States	70-100%	**88.3%**	✓
International Developed Markets	0-30%	**5.4%**	✓
International Emerging Markets	0-15%	**6.1%**	✓
International Frontier Markets	0-5%	**0.3%**	✓

Public Securities	%Policy Range	%NAV	Policy Compliance
Real Assets	0-10%	**0.1%**	✓

Leverage	Policy Limit	Current	Policy Compliance
LTV	55%	**32.9%**	✓
DSCR Total (minimum)	1.40	**2.32**	✓

II. Investment Review

a. **Real Estate**
b. Infrastructure
c. Forestland

Past Year Environment Review – Real Estate

- Capital Markets
  - Markets are competitive, but showing early signs of pullback of institutional capital in the U.S. markets.
  - Lenders have been conservative and borrowing costs remain low.
  - Cap rates have stabilized, but remain at historic lows despite upward pressure on the 10-yr Treasury.
- Property Fundamentals
  - New supply is ramping up across property sectors except retail; apartments are experiencing over supply in select Metropolitan Statistical Areas (MSAs).
  - Net Operating Income (NOI)* growth continues to moderate; retail is experiencing challenges from e-commerce and consumer behavior.
  - Vacancy rates remain below historical average; apartment and retail vacancy rates are climbing slightly.

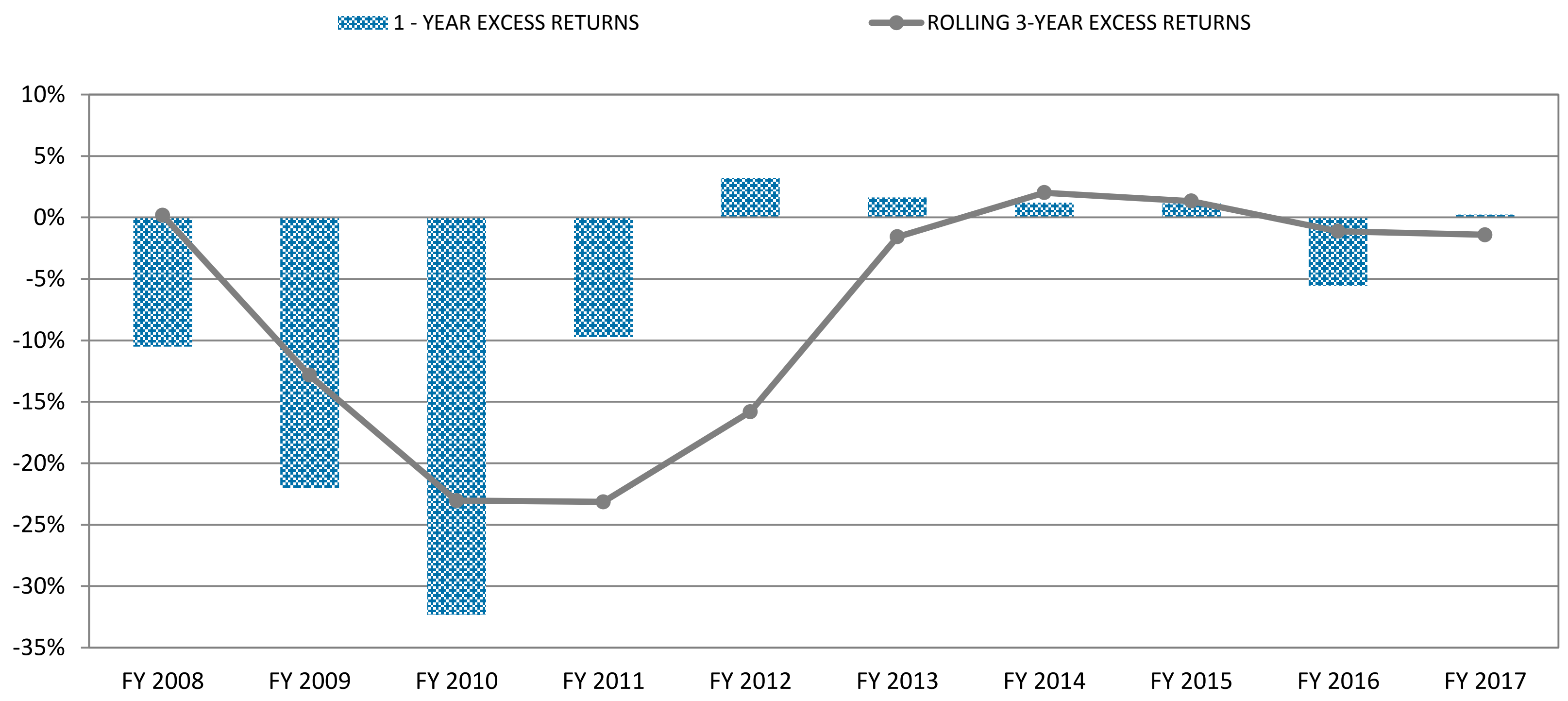
* NOI is net operating income before capital expense and interest expense

Program Performance Review – Real Estate

As of June 30, 2017	1-Year Net Return	3-Year Net Return	5-Year Net Return	10-Year Net Return	20-Year Net Return
Real Estate	**7.6%**	**9.4%**	**10.8%**	**-1.3%**	**6.8%**
Policy Index	7.4%	10.8%	11.1%	7.8%	10.3%
Excess Return	0.2%	-1.4%	-0.3%	-9.1%	-3.5%

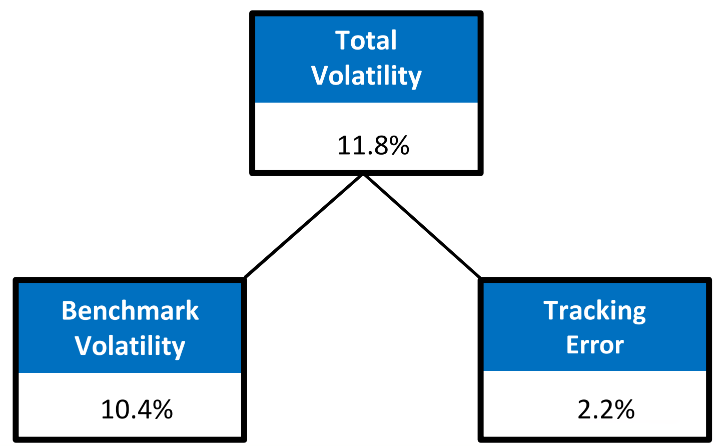
- Real Estate outperformed the 2013 ALM expected return of 7% for the 1-, 3-, and 5-year periods.
- Underperformance in 3- and 5-year periods driven primarily by non-core holdings in domestic land, housing, and international investments.
- Core performance in 3- and 5-year periods were 14.2% and 14.9%, respectively. Core outperformed the Real Estate Policy Index by 340 bps and 380 bps.

Program Performance Review – Real Estate (Cont'd) 3-Year Rolling Excess Return



Volatility Profile – Real Estate

- Real Estate Forecast Volatility is 11.8%.
- Forecast Tracking Error is 2.2%.
- Correlation vs. the entire PERF portfolio is 0.73.



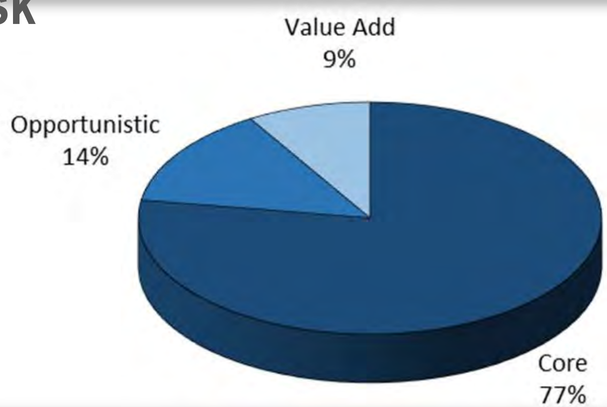
Source: MSCI BarraOne Risk System – Real Estate holdings data as of 3/31/17 and BarraOne Model information as of 6/30/17

Program Characteristics – Real Estate

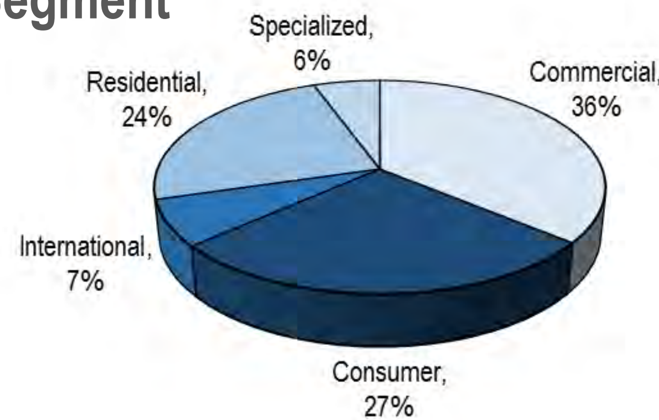
- **Total NAV:** $30.5 billion.
  - Program NAV is 9.4% of Total Fund, versus 11% target.
  - Program NAV increased 11.9% from $27.3 billion to $30.5 billion.
- **Unfunded:** $7.0 billion ($6.8 billion revocable by CalPERS)
- **Structure:**
  - 21 External Managers.
  - 28 Separate Accounts, 12 Commingled Funds, 1 Operating Company.
    - NAV Basis: 79% Separate Accounts, 8% in Commingled Funds, 13% Operating Company.
- **Geographic Exposure:**
  - 93% U.S., 6% International Emerging Markets, 1% International Developed Markets.
  - 30% NAV invested in California.

Program Characteristics – Real Estate by NAV*

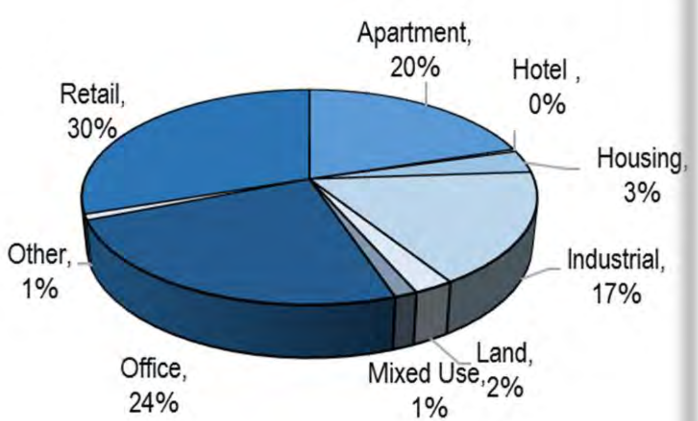
Risk



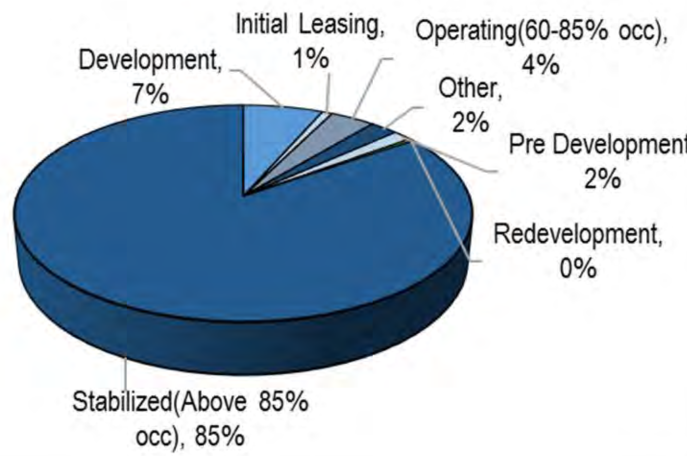
Segment



Property Type



Life Cycle



*Period ending March 31, 2017 with total property level NAV amounting to $30.5 billion

Portfolio Positioning – Real Estate

Risk Classification	%Policy Range	%NAV	Policy Compliance
Core	75-100%	**77.5%**	✓
Value Add	0-25%	**8.6%**	✓
Opportunistic	0-25%	**13.9%**	✓
Development or Build-to-Core	0-10%	**8.1%**	✓

Geography	%Policy Range	%NAV	Policy Compliance
United States	75-100%	**93.0%**	✓
International Developed Markets	0-25%	**0.7%**	✓
International Emerging Markets	0-15%	**6.3%**	✓
International Frontier Markets	0-5%	**0.0%**	✓

Leverage	Policy Limit	Current	Policy Compliance
LTV	50%	**31.4%**	✓
DSCR Total (minimum)	1.50	**2.46**	✓
DSCR Core (minimum)	2.00	**2.52**	✓

II. Investment Review

a. Real Estate
b. Infrastructure
c. Forestland

Past Year Environment Review – Infrastructure

- Fierce competition for new investments.
- Supportive credit markets.
- U.S. public ‘Infrastructure Gap’ continues.
- Transition to “clean” power generation continues to accelerate.
- U.S. government pledged higher infrastructure spending, but little action has materialized.
- Challenged energy companies continue to divest assets and utilize private capital for expansions / growth strategies.

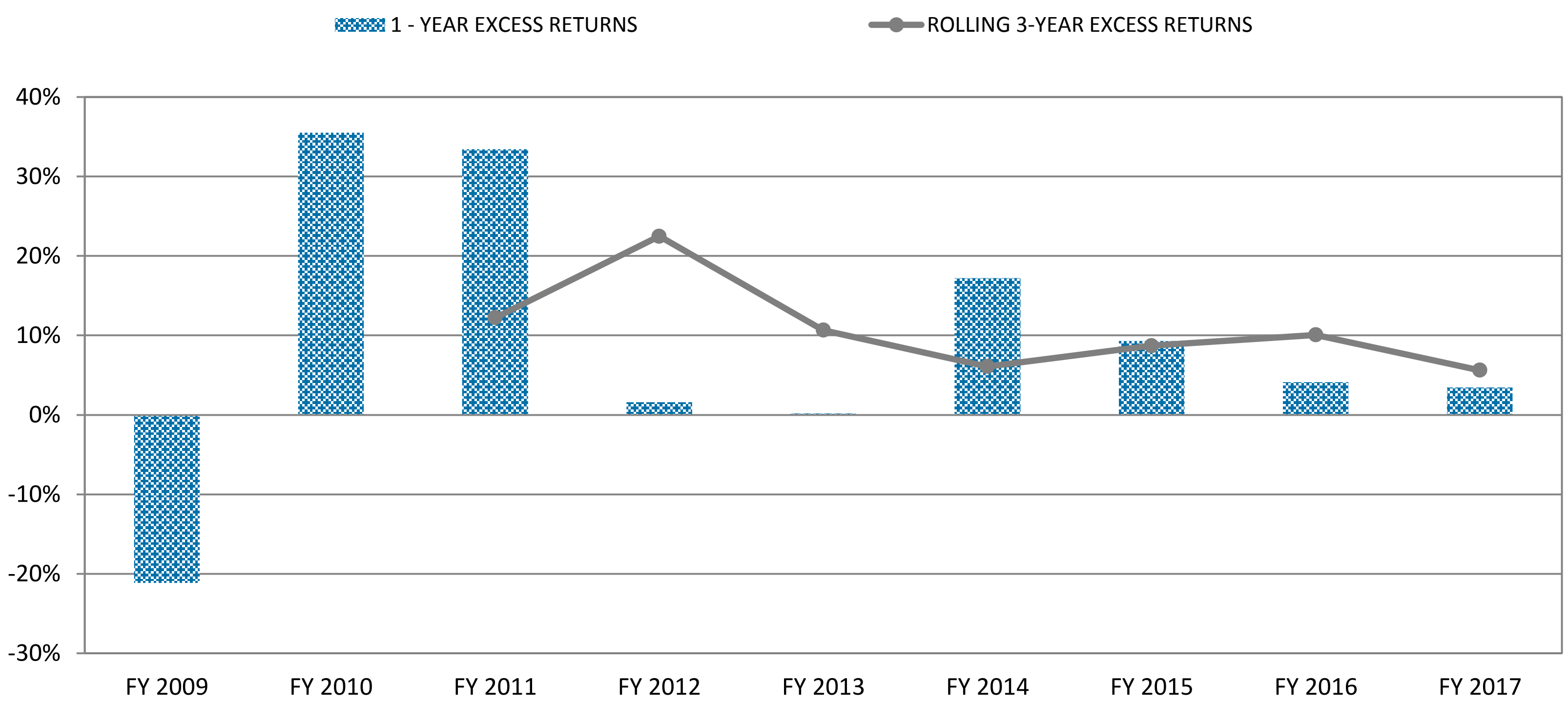
Program Performance Review – Infrastructure

As of June 30, 2017	1-Year Net Return	3-Year Net Return	5-Year Net Return	Since Inception
Infrastructure	**9.9%**	**10.7%**	**12.0%**	**12.6%**
Policy Index	6.5%	5.1%	5.3%	6.1%
Excess Return	3.4%	5.6%	6.7%	6.5%

- Infrastructure outperformed the 2013 ALM expected return of 7% for the 1-, 3-, and 5-year periods.
- The Infrastructure Program outperformed across all measured periods. Strong performance was primarily driven by core holdings.

Note: Infrastructure has an inception date of January 2008

Program Performance Review – Infrastructure (Cont'd) 3-Year Rolling Excess Return



Note: Infrastructure has an inception date of January 2008

Volatility Profile – Infrastructure

- Infrastructure Forecast Volatility is 9.1%.
- Correlation vs. the entire PERF portfolio is 0.85.

Note: Infrastructure benchmark is CPI+4%, therefore tracking error and benchmark volatility are not shown since they are not meaningful.

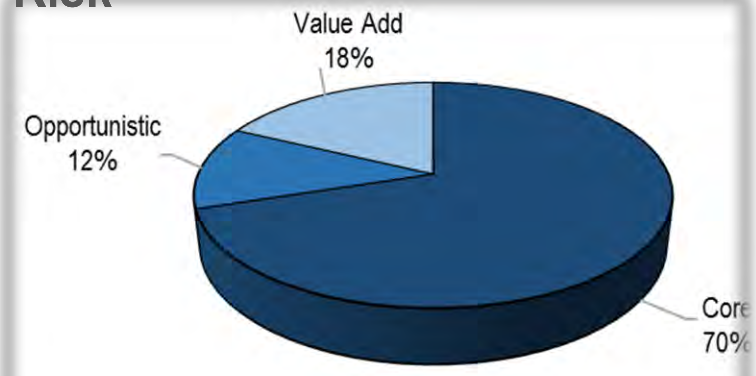
Source: MSCI BarraOne Risk System – Infrastructure holdings data as of 3/31/17 and BarraOne Model information as of 6/30/17

Program Characteristics – Infrastructure

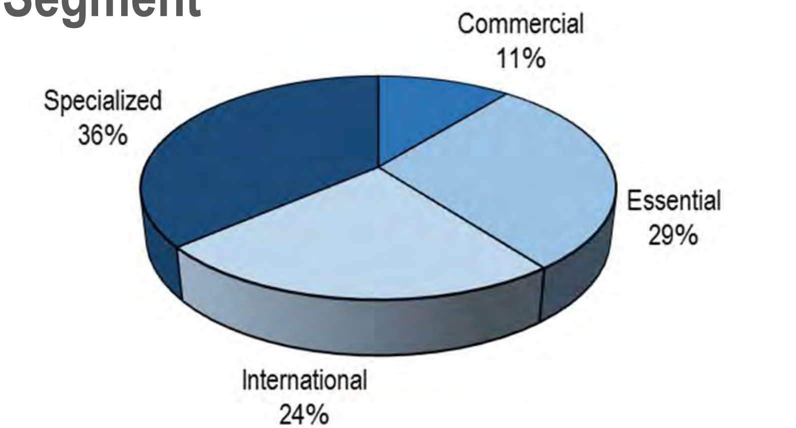
- **Total NAV:** $3.8 billion.
  - Program NAV is 1.2% of Total Fund, with a 1% interim target.
  - Program NAV increased 47.0% from $2.6 billion to $3.8 billion.
- **Unfunded:** $1.7 billion ($1.3 billion at CalPERS discretion)
- **Structure:**
  - 8 External Managers.
  - 3 Separate Accounts, 8 Commingled Funds, and 3 Direct Investments.
    - NAV Basis: 33% Separate Accounts, 36% in Commingled Funds, 31% in Direct Investments.
- **Geographic Exposure:**
  - 56% U.S. and 44% International.
  - 10% NAV invested in California.

Program Characteristics – Infrastructure by NAV*

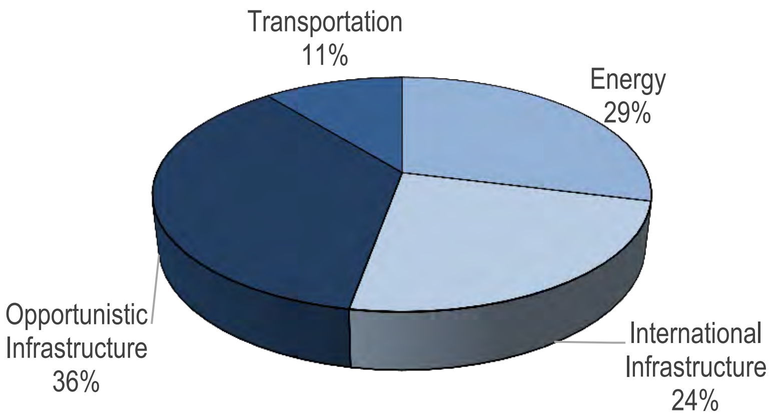
Risk



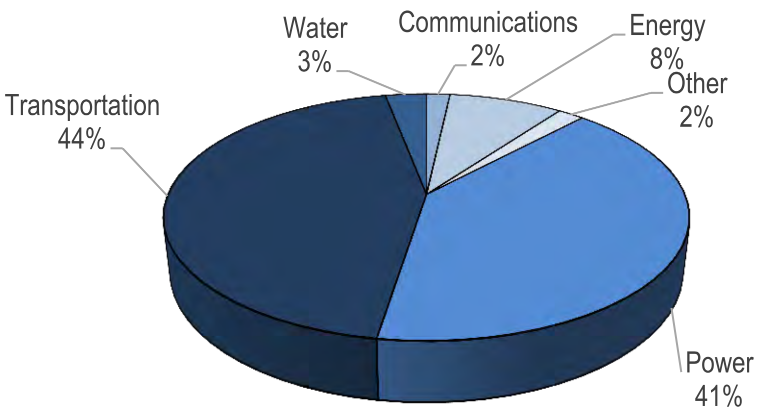
Segment



Sector



Asset Type



*Period ending March 31, 2017 with total NAV amounting to $3.8 billion.

Portfolio Positioning – Infrastructure

Risk Classification	%Policy Range	%NAV	Policy Compliance
Core	60-100%	**70.1%**	✓
Value Add	0-25%	**17.9%**	✓
Opportunistic	0-25%	**12.0%**	✓
Development or Build-to-Core	0-10%	**0.0%**	✓

Geography	%Policy Range	%NAV	Policy Compliance
United States	50-100%	**56.3%**	✓
International Developed Markets	0-50%	**42.6%**	✓
International Emerging Markets	0-15%	**1.1%**	✓
International Frontier Markets	0-5%	**0.0%**	✓

Leverage	Policy Limit	Current	Policy Compliance
LTV	65%	**46.6%**	✓
DSCR Total (minimum)	1.25	**2.25**	✓

* The Key Policy Parameters pertaining to risk and geographic segments will apply to the Infrastructure portfolio only when the NAV for that portfolio exceeds $5.0 billion.

II. Investment Review

a. Real Estate
b. Infrastructure
c. **Forestland**

Past Year Environment Review – Forestland

- U.S. housing starts continue to recover, but remain below the long-term average.
- Domestic Forestland investment values reflect continuing recovery in log prices and housing starts.
- Forestland transaction activity was moderate; some large acquisitions were split between multiple buyers.
- Escalating trade tensions between the U.S. and Canada resulted in the U.S. government imposing duties on Canadian softwood lumber imports.

Program Performance Review – Forestland

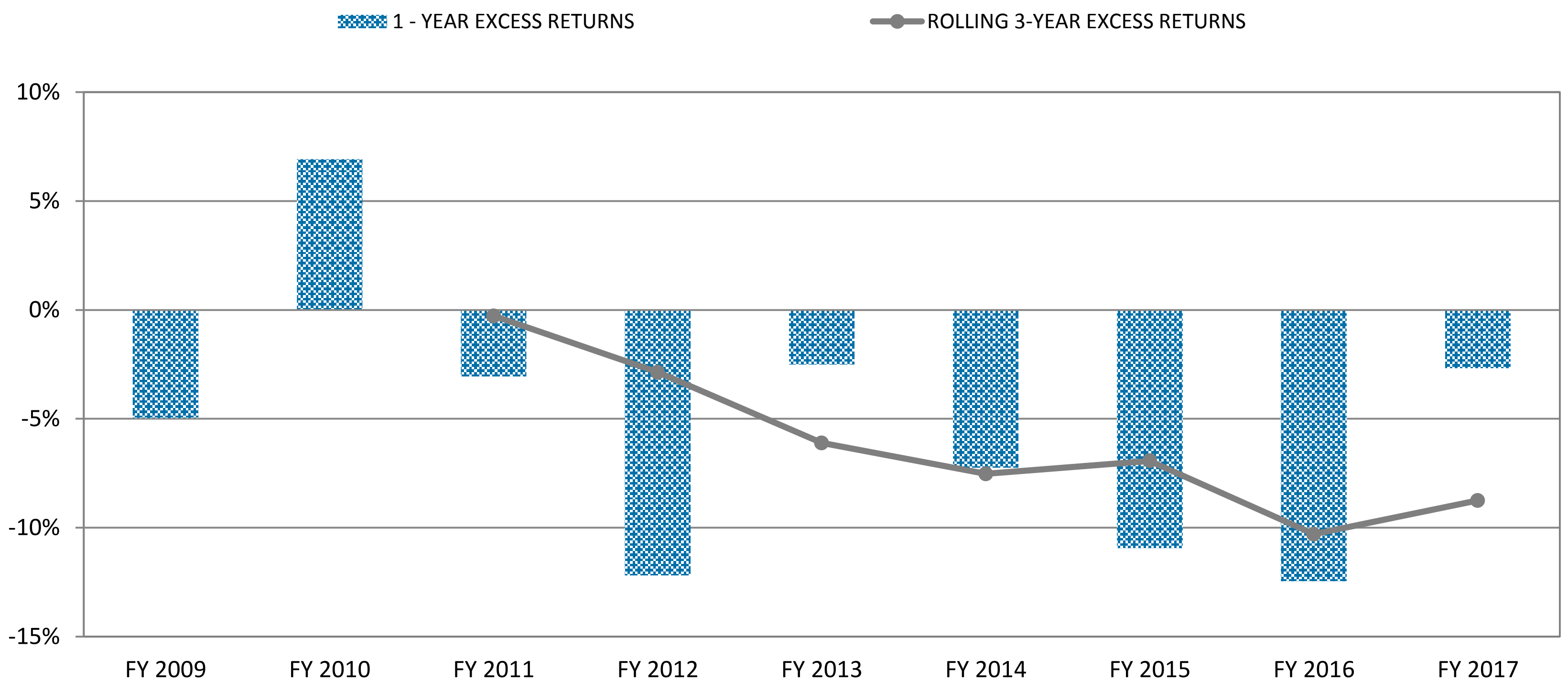
As of June 30, 2017	1-Year Net Return	3-Year Net Return	5-Year Net Return	Since Inception
Forestland	**1.0%**	**-3.1%**	**-0.1%**	**-0.4%**
Policy Index	3.6%	5.7%	7.1%	5.3%
Excess Return	-2.7%	-8.8%	-7.3%	-5.7%

- Forestland underperformed the 2013 ALM expected return of 7% for the 1-, 3-, and 5-year periods.

Note: Forestland has an inception date of January 2008

2 Long-Term Horizon 9 Multi-faceted Risk

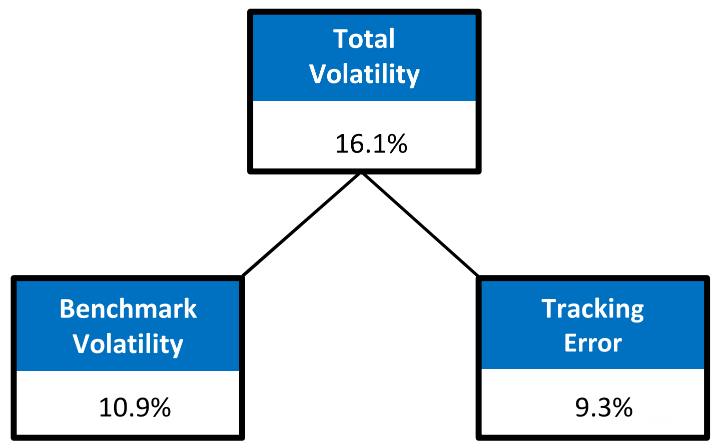
Program Performance Review – Forestland (Cont'd)
3-Year Rolling Excess Return



Note: Forestland has an inception date of January 2008

Volatility Profile – Forestland

- Forestland Forecast Volatility is 16.1%.
- Forecast Tracking Error is 9.3%.
- Correlation vs. the entire PERF portfolio is 0.60.



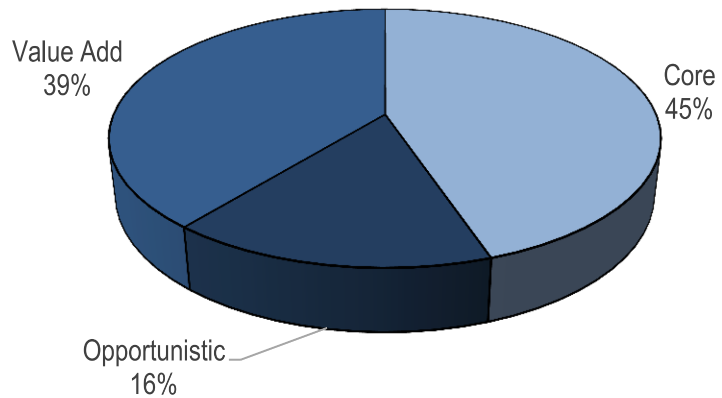
Source: MSCI BarraOne Risk System – Forestland holdings data as of 3/31/17 and BarraOne Model information as of 6/30/17

Program Characteristics – Forestland

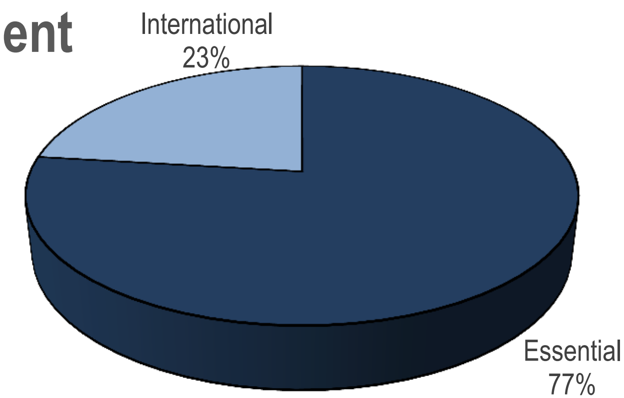
- **Total NAV:** $1.98 billion.
  - Program NAV is 0.6% versus 1% target allocation of Total Fund.
  - Program NAV increased 0.3% from $1.97 billion to $1.98 billion.
- **Unfunded:** $0.
- **Structure:**
  - 2 External Managers.
  - 2 Separate Accounts.
    - NAV Basis: 100% Separate Accounts.
- **Geographic Exposure:**
  - 77% U.S. and 23% International.

Portfolio Characteristics – Forestland by NAV[(a)]

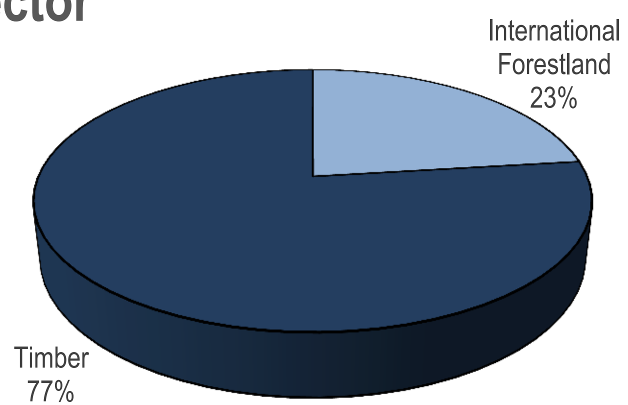
Risk



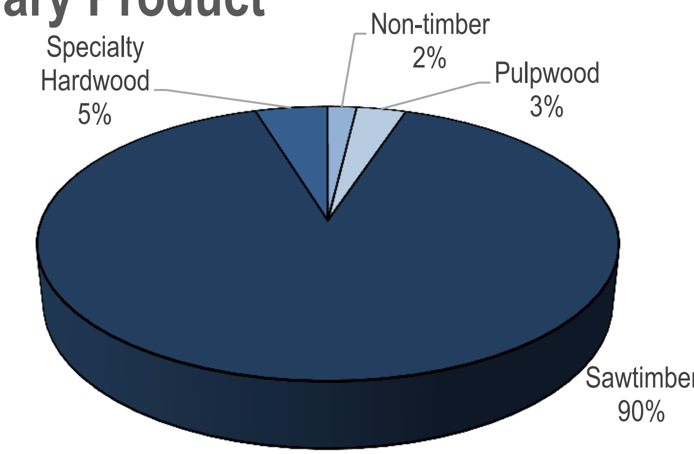
Segment



Sector



Primary Product



(a) Period ending March 31, 2017 with total NAV amounting to $2.0 billion..

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Real Assets

Portfolio Positioning – Forestland

Risk Classification	%Policy Range	%NAV	Policy Compliance
Core	75-100%	**44.8%**	✘
Value Add	0-25%	**39.1%**	✘
Opportunistic	0-25%	**16.1%**	✓
Development or Build-to-Core	0-10%	**0.0%**	✓

Geography	%Policy Range	%NAV	Policy Compliance
United States	50-100%	**76.9%**	✓
International Developed Markets	0-50%	**7.0%**	✓
International Emerging Markets	0-15%	**11.4%**	✓
International Frontier Markets	0-5%	**4.8%**	✓

Leverage	Policy Limit	Current	Policy Compliance
LTV	40%	**22.3%**	✓
DSCR Total (minimum)	1.25	**0.71**	✘

III. Business Review

Real Assets Investment Decision Process

Real Assets Investment Committee (RAIC):
- Decision making body
- Reviews all investment decisions

Members:
- RAIC Chair (MID)
- 7 voting members (RAU MID/3 RAU IDs/1 RAU IM/2 External INVO MIDs or ID/IMs)

Investment Manager Sub-Committee (IMS):
- Deliberative body to RAIC
- Reviews all investment decisions prior to review by RAIC

Members:
- Rotating IMS Chair/Co-Chair (quarterly)
- 10 voting members (8 IMs and 2 AIMs)

Strategic and Segment Planning
- Strategic Plan approved by Investment Committee
- Segment Plans outline sector tactical plans for each product type

Sourcing
- Active searches based on needs determined by planning process
- Emerging Manager proposals referred to mentor program
- Unsolicited proposals

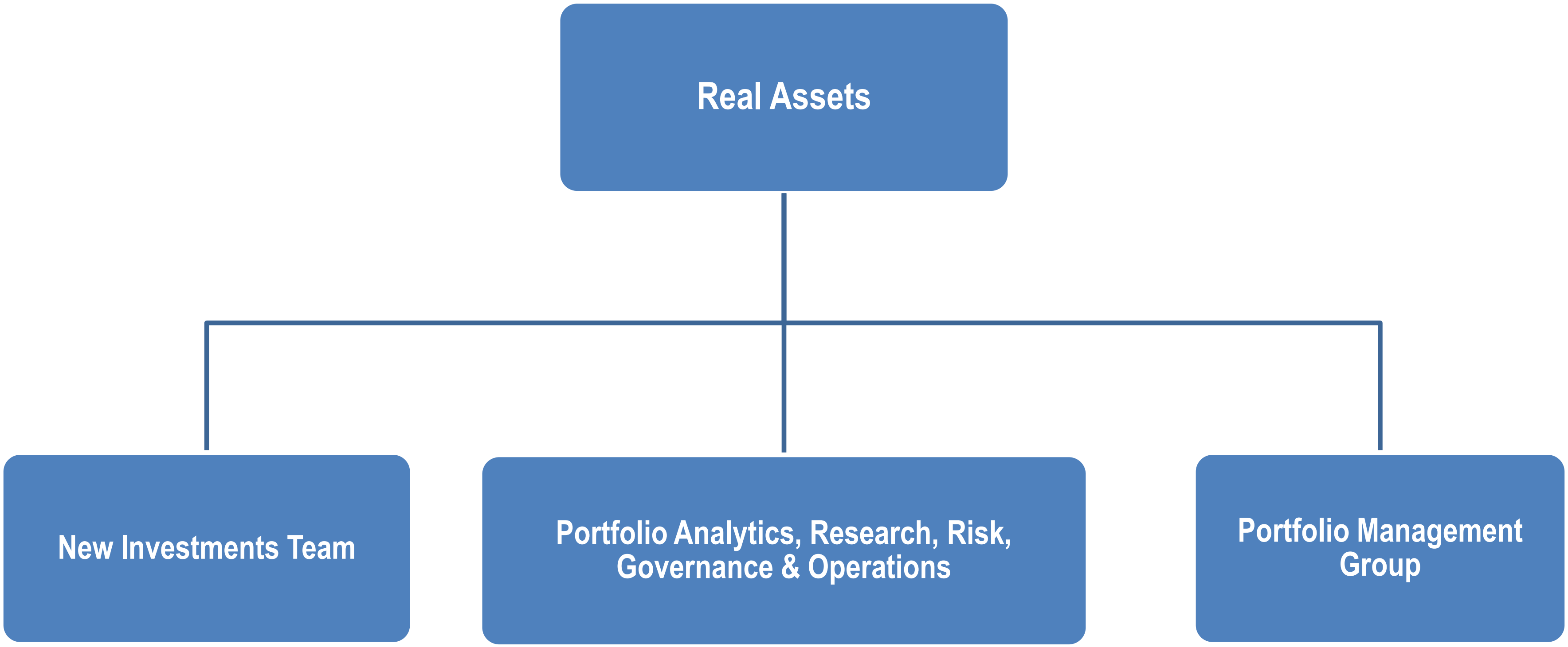
Screening and Due Diligence
- Proposals are tracked in the Investment Portal (ISP), an INVO web-based system
- Staff scores proposals using standardized assessment tools and/or filters
- Approved transactions: Staff refer to partners and/or conducts Due Diligence – and negotiates contractual agreements
- For manager searches, Staff engages ICOR to conduct an Operational Due Diligence review.
- Prudent Person Opinion rendered for transactions above $50m

Investment Manager Sub-Committee (IMS)
- Committee of 10 staff (IMs and AIMs)
- Rotating Chair and Co-Chair
- RAIC voting members can attend
- Reviews investments and advises RAIC

Real Assets Investment Committee (RAIC)
- Committee of seven staff chaired by Managing Investment Director (MID)
- Board consultant(s) attend all meetings
- Reviews and votes on investments

- In fiscal year 2016-2017, RAIC made investment decisions representing $10.7 billion of investment, disposition, and debt decisions.

Functional Organizational Chart



Staffing Overview

TOTAL PROGRAM [1]

- 55 total positions within Real Assets; one fewer than the number of positions in 2015-2016

STAFFING UPDATES [1]

- Appointed 1 Investment Director
- Appointed 3 Investment Managers
- Appointed 2 Associate Investment Managers
- Appointed 1 Investment Officer III
- Appointed 3 Investment Officer IIs
- Appointed 1 Investment Officer Is
- Appointed 3 Associate Governmental Program Analysts
- Appointed 1 Office Technician (Typing)
- Appointed 2 Seasonal Clerks
- Transferred 1 IM and 2 IO positions to other INVO programs

CURRENT VACANCIES [2]

- 1 Seasonal Clerk
- 1 Staff Services Analyst
- 1 Associate Governmental Program Analyst
- 2 Investment Officer IIs
- 1 Investment Officer III
- 1 Investment Manager
- 1 Investment Director

[1] From July 1, 2016 through June 30, 2017
[2] As of September 11, 2017

Strategic Plans

	Policy Requirement	Investment Committee Approval
Real Assets	Strategic Plan updated at a minimum every five years, setting forth CalPERS' long-term objectives for investment and management of the Program.	April 2016

- Role of asset class and benchmark are inputs into strategic planning process provided by Asset Allocation framework.
- Integrated Real Assets Strategic Plan harmonizing underlying programs:
  - Real Estate
  - Infrastructure
  - Forestland
- Established Real Assets parameters; Harmonizing nomenclature; Reducing risk, costs, and complexity; Increasing transparency.
- Consistent with Vision 2020 of reducing complexity.

Strategic Projects Update

Initiatives	Activities
Strategic Plan Update	• Continue implementation of strategic plan, including segment/sector planning. • Implementing Segment Plan recommendations. • Completed Portfolio Hierarchy – Systems / Database
Real Assets Investment Policy Revision	• Real Assets MID Delegation of Authority approved September 2016. • Investment Policy Procedures Guidelines approved December 2016. • Desktop Procedure Manual approved June 2017.
Portfolio Repositioning	• Fully realized secondary sale of commingled funds July 2017. • Continued Real Estate and Infrastructure portfolio growth through new investments. • External Manager Reduction.
RE Emerging & Transition Manager Program	<u>RE Emerging Managers:</u> • Demonstrated commitment through expansion effort. • Evaluate additional Real Estate emerging managers. <u>RE Transition Managers:</u> • Evaluate/Define strategy and sector focus.

Emerging & Transition Manager Programs in Real Estate

- **FY 2016/17 Significant Events**
  - As part of the Annual Investment Plan FY 2016/17, the Emerging Manager Program received an allocation of $75M. Total commitments of $600M as of 6/30/17.

- **Current Status/Update**
  - Completed fifth year of Innovative Mentoring Manager Model.
  - Continued favorable feedback to our programmatic joint venture structure.
  - Mentoring managers are evaluating the transition readiness of existing emerging managers and maintain outreach efforts to the broader emerging manager community.
  - Through its first 5 years, the programs have been performing above expectations.
  - Canyon and CalPERS discussing broadening and expanding Emerging Manager Program.

Program Expenses – Real Estate

	FY 2016-17			FY 2015-16		
	AUM ($billions)	Fees and Profit Sharing ($millions)	Fees and Profit Sharing[a] (BPS)	AUM ($billions)	Fees and Profit Sharing ($millions)	Fees and Profit Sharing[a] (BPS)
Internal Management	$0	$ 9.6	3	$0	$8.5	3
External Management[b]	$ 30,536	$ 186.5	61	$ 27,296	$ 399.9	147
Asset Management Fees Paid	N/A	$ 159.8	52	N/A	$ 155.8	57
Profit Sharing Paid	N/A	$ 75.4	25	N/A	$ 81.1	30
Profit Sharing Accrued	N/A	($ 48.7)[c]	(16)	N/A	$ 163.0	60
Consultants Expense	N/A	$ 1.3	0	N/A	$ 2.1	1
Technology & Operating Expense	N/A	$ 11.0	4	N/A	$ 12.2	4
Total Program	**$ 30,536**	**$ 208.4**	**68**	**$ 27,296**	**$ 422.7**	**155**

FY 2016-17 CalPERS ($millions)	
Realized and Unrealized Gains	$1,130.6

Note: Some totals may not reconcile due to rounding. Four quarters of data ending on 3/31/17 and 3/31/16 respectively.
[a] All BPS fees and expenses paid figures are calculated on Total Program AUM defined as NAV (Net Asset Value).
[b] External Management totals include asset management fees and profit sharing fees (paid and accrued)
[c] Negative performance fees are due to the reversal of accruals caused by the fluctuation in market.
Note: Total profit sharing liabilities are $687 million as of 3/31/2017 and were $1.26 billion as of 3/31/2016.

Program Expenses – Real Estate

- External Management fees declined by 53% Y-o-Y as a portion of the incentive fees paid this year were accrued and expensed in prior years.
- Implementation of new fee alignment structure with strategic managers facilitates better alignment and drives cost efficiency and predictability.

Program Expenses – Infrastructure & Forestland

	FY 2016-17			FY 2015-16		
	AUM ($billions)	Fees and Profit Sharing ($millions)	Fees and Profit Sharing (BPS)[a]	AUM ($billions)	Fees and Profit Sharing ($millions)	Fees and Profit Sharing (BPS)[a]
Internal Management	$0	($ 0.4)[b]	(1)	$0	$ 1.4	3
External Management[c]	$ 5,755	$ 57.1	99	$ 4,541	$ 58.0	128
Asset Management Fees Paid	N/A	$ 27.2	47	N/A	$ 22.8	50
Profit Sharing Paid	N/A	$ 0	0	N/A	$ 1.8	4
Profit Sharing Accrued	N/A	$ 29.9	52	N/A	$ 33.5	74
Consultants Expense	N/A	$ .1	0	N/A	$ .2	0
Technology & Operating Expense	N/A	$ 1.0	2	N/A	$ 1.0	2
Total Program	**$ 5,755**	**$ 57.8**	**100**	**$ 4,541**	**$ 60.6**	**134**

FY 2016-17 CalPERS ($millions)	
Realized and Unrealized Gains	$288.1

Note: Some totals may not reconcile due to rounding. Four quarters of data ending on 3/31/17 and 3/31/16 respectively
[a] All BPS fees paid figures are calculated on Total Program AUM defined as NAV (Net Asset Value).
[b] -$400K due to accrual reversals and corrections in accounting.
[c] External Management totals include asset management fees and profit sharing fees (paid and accrued).
Note: Total profit sharing liabilities are $83.9 million as of 3/31/2017 and were $80.2 million as of 3/31/2016.

Program Expenses – Infrastructure & Forestland

- Separate account strategic partnerships negotiated for the Infrastructure component carry better economic terms and governance than commingled funds.
- Separate accounts are anticipated to be the primary mode of new investment.
- Fees as a percentage of NAV are expected to decrease as the portfolio grows through new separate account vehicles.

IV. Governance & Sustainability Integration

Progress on Strategic Plan Initiatives

Total Fund ESG Strategic Plan Category	RAU Strategic Plan Targets	Progress to Date
Manager Expectations	• ESG factor consideration matrix utilized • ESG monitoring and benchmarking tools utilized • Climate & Resource Scarcity Risk Assessment for Core Portfolio	• Launched Real Estate's ESG consideration matrix July 1, 2017 (joining Infrastructure) for separate accounts • GRESB survey utilized with 15 partners. • RAU participating in Climate Risk Data Mapping project launched in 2017.
Research	• Year 1: conduct clean power & energy efficiency sectors research, identify opportunities • Year 2-5: develop and implement priority initiatives	• Held an Energy Optimization (EO) Initiative Roundtable in September 2016 with industry experts and investment partners. • Incorporated the EO Initiative into the AIP process for FY 2017-18. • Research, develop and assess energy optimization strategies.
Responsible Contractor Program (RCP)	• Continue Responsible Contractor Program (RCP)	• CalPERS Separate Account operating agreements continue to include provisions requiring compliance with the Responsible Contractor Program Policy.