Wilshire

WILSHIRE ASSOCIATES

Wilshire Consulting

Employees' Retirement Fund of the City of Dallas: 2019 Asset Allocation Modeling

Ali Kazemi, Managing Director
Thomas Toth, CFA, Managing Director

November 12, 2019

Wilshire Consulting
Asset Class Assumptions

	Domestic Equity	International Equity	Global Equity	Global Low Volatility Equity	Private Equity	Core Fixed Income	High Yield Fixed Income	Credit Opportunities	REITs	Private Real Estate - Core	Private Real Estate - Value Add	MLP	Global Public Infrastructure	Marketable Alternatives
Return - 10-Year (%)	6.00	6.75	6.45	6.41	8.05	2.70	4.20	5.35	4.70	5.40	8.00	7.60	7.23	4.42
Risk (%)	17.00	18.80	17.05	13.46	28.00	5.15	10.00	10.33	17.00	12.00	17.50	19.00	16.96	4.59
Cash Yield (%)	2.00	3.25	2.55	2.68	0.00	2.80	7.55	4.00	3.55	3.35	1.70	6.40	5.80	0.00
Correlations														
Domestic Equity	1.00													
International Equity	0.83	1.00												
Global Equity	0.94	0.94	1.00											
Global Low Volatility Equity	0.93	0.92	0.96	1.00										
Private Equity	0.74	0.67	0.74	0.77	1.00									
Core Fixed Income	0.28	0.09	0.20	0.21	0.31	1.00								
High Yield Fixed Income	0.54	0.45	0.51	0.51	0.34	0.25	1.00							
Credit Opportunities	0.59	0.57	0.61	0.60	0.41	0.27	0.74	1.00						
REITs	0.59	0.49	0.56	0.64	0.50	0.17	0.56	0.59	1.00					
Private Real Estate - Core	0.55	0.48	0.53	0.64	0.51	0.17	0.57	0.59	0.85	1.00				
Private Real Estate - Value Add	0.50	0.42	0.48	0.58	0.48	0.18	0.54	0.58	0.70	0.85	1.00			
MLP	0.40	0.39	0.41	0.38	0.44	0.13	0.50	0.51	0.45	0.45	0.42	1.00		
Global Public Infrastructure	0.50	0.52	0.53	0.50	0.52	0.14	0.57	0.58	0.53	0.50	0.47	0.98	1.00	
Marketable Alternatives	0.43	0.55	0.55	0.52	0.42	0.08	0.58	0.59	0.33	0.33	0.29	0.47	0.51	1.00

©2019 Wilshire Associates.

BUILDING ASSET ASSUMPTIONS

- Wilshire's asset class assumptions are 10 year time horizon forecasts used as primary inputs into the asset allocation process
- Global Equity assumptions are based on a dividend discount model with a complimentary Income + Growth + Valuation model overlay, and an additional relative valuation signal added in 2019
- Fixed Income assumptions build off key inputs of inflation expectations, current yield and spread levels, and historical spread and real yield levels
  - Incorporate a view on interest rate/yield changes that normalize current maturity and credit risk premiums to historical levels
  - Credit oriented investments further incorporate expectations about default and recovery rates
- Real Assets such as real estate assumptions follow a general yield + expected growth model depending on the specific market
- Private asset classes, which are found across market sectors, are adjusted based on required premiums for illiquidity and differing levels of leverage

©2019 Wilshire Associates.

BUILDING ASSET ASSUMPTIONS

- Other Assumption Considerations:
- Global Public Infrastructure assumptions are based on 75% MLP and 25% Listed Public Infrastructure modeling
- Credit Opportunities assumptions are based on a combination of:
  - 33% Distressed Debt (Could also be implemented as Private Debt)
  - 33% Bank Loans (Could also be implemented as Private Credit)
  - 33% Hard Currency EMD

©2019 Wilshire Associates.

Asset Allocation

POINTS OF CONSIDERATION

Range of portfolios were considered that factored in the following changes:

1. Increasing Private Equity allocation (Return Seeking)
2. Moving from Market Cap Equities to Low Volatility Equities (Risk Decreasing)
3. Decreasing REIT exposure (Risk Decreasing)
4. Enhancing Private Real Estate with a Value Add allocation (Return Seeking)
5. Eliminating MLP as a standalone bucket and introducing a diversified Global Public Infrastructure bucket (Risk Decreasing)
6. Potential Introduction of Marketable Alternatives (Risk Decreasing)

- After a few rounds of discussion with staff, two potential portfolios are presented for consideration by the Board

©2019 Wilshire Associates.

Wilshire Consulting

Recommended Portfolios

Asset Class	Current Target Policy	Option A - Including Marketable Alternatives	Option B - Excluding Marketable Alternatives
Domestic Equity	15.00%	12.50%	15.00%
International Equity	15.00%	12.50%	15.00%
Global Equity	7.50%	7.50%	7.50%
Global Low Volatility Equity	10.00%	12.50%	10.00%
Private Equity	5.00%	7.50%	7.50%
Total Growth	**52.50%**	**52.50%**	**55.00%**
Core Fixed Income	15.00%	15.00%	15.00%
High Yield Fixed Income	10.00%	10.00%	10.00%
Credit Opportunities	5.00%	5.00%	5.00%
Total Fixed Income	**30.00%**	**30.00%**	**30.00%**
REITs	5.00%	2.50%	2.50%
Private Real Estate - Core	5.00%	5.00%	5.00%
Private Real Estate - Value Add	0.00%	2.50%	2.50%
MLPs	7.50%	0.00%	0.00%
Global Public Infrastructure	0.00%	5.00%	5.00%
Total Inflation Hedging Assets	**17.50%**	**15.00%**	**15.00%**
Marketable Alternatives	0.00%	2.50%	0.00%
Total Diversifying Assets	**0.00%**	**2.50%**	**0.00%**
Total Assets	**100.0%**	**100.0%**	**100.0%**
Expected Return - 10 Years (%)	**6.08**	**6.10**	**6.15**
Standard Deviation of Return (%)	**11.61**	**11.50**	**11.93**
Cash Yield (%)	**3.45**	**3.15**	**3.21**
+/(-) in Expected Return - 10 Years	**-**	**2**	**7**
+/(-) in SD of Return (bps)	**-**	**(11)**	**32**
+/(-) in Cash Yield (bps)	**-**	**(30)**	**(24)**
Return\Risk Ratio	**0.52**	**0.53**	**0.52**

©2019 Wilshire Associates.

Appendix

Wilshire Consulting
Portfolio Modeling

Wilshire

		From Lower to Higher Risk								
Asset Class	**Current Target Policy**	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 7**	**Option 8**	**Option 9**
Domestic Equity	15.00%	10.00%	13.75%	12.50%	12.50%	15.00%	12.50%	15.00%	15.00%	10.00%
International Equity	15.00%	10.00%	13.75%	12.50%	12.50%	15.00%	12.50%	15.00%	15.00%	10.00%
Global Equity	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
Global Low Volatility Equity	10.00%	10.00%	10.00%	12.50%	10.00%	10.00%	12.50%	10.00%	10.00%	10.00%
Private Equity	5.00%	5.00%	5.00%	7.50%	7.50%	5.00%	7.50%	7.50%	7.50%	15.00%
Total Growth	**52.50%**	**42.50%**	**50.00%**	**52.50%**	**50.00%**	**52.50%**	**52.50%**	**55.00%**	**55.00%**	**52.50%**
Core Fixed Income	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
High Yield Fixed Income	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	7.50%	10.00%	10.00%	10.00%
Credit Opportunities	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Total Fixed Income	**30.00%**	**30.00%**	**30.00%**	**30.00%**	**30.00%**	**30.00%**	**27.50%**	**30.00%**	**30.00%**	**30.00%**
REITs	5.00%	5.00%	5.00%	2.50%	5.00%	5.00%	5.00%	2.50%	5.00%	5.00%
Private Real Estate - Core	5.00%	2.50%	2.50%	5.00%	2.50%	5.00%	2.50%	5.00%	2.50%	2.50%
Private Real Estate - Value Add	0.00%	2.50%	2.50%	2.50%	2.50%	0.00%	2.50%	2.50%	2.50%	2.50%
MLPs	7.50%	0.00%	7.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Global Public Infrastructure	0.00%	7.50%	0.00%	5.00%	7.50%	7.50%	7.50%	5.00%	5.00%	7.50%
Total Inflation Hedging Assets	**17.50%**	**17.50%**	**17.50%**	**15.00%**	**17.50%**	**17.50%**	**17.50%**	**15.00%**	**15.00%**	**17.50%**
Marketable Alternatives	0.00%	10.00%	2.50%	2.50%	2.50%	0.00%	2.50%	0.00%	0.00%	0.00%
Total Diversifying Assets	**0.00%**	**10.00%**	**2.50%**	**2.50%**	**2.50%**	**0.00%**	**2.50%**	**0.00%**	**0.00%**	**0.00%**
Total Assets	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Expected Return - 10 Years (%)	**6.08**	**5.91**	**6.11**	**6.10**	**6.13**	**6.03**	**6.17**	**6.15**	**6.14**	**6.38**
Standard Deviation of Return (%)	**11.61**	**10.38**	**11.34**	**11.50**	**11.55**	**11.67**	**11.71**	**11.93**	**12.02**	**12.47**
Cash Yield (%)	**3.45**	**3.10**	**3.34**	**3.15**	**3.23**	**3.40**	**3.11**	**3.21**	**3.22**	**3.10**
+/(-) in Expected Return - 10 Years	**-**	**(18)**	**3**	**2**	**4**	**(6)**	**9**	**7**	**6**	**30**
+/(-) in SD of Return (bps)	**-**	**(124)**	**(27)**	**(11)**	**(6)**	**5**	**10**	**32**	**41**	**86**
+/(-) in Cash Yield (bps)	**-**	**(35)**	**(11)**	**(30)**	**(22)**	**(5)**	**(34)**	**(24)**	**(23)**	**(35)**
Return\Risk Ratio	**0.52**	**0.57**	**0.54**	**0.53**	**0.53**	**0.52**	**0.53**	**0.52**	**0.51**	**0.51**

* Option 3 is the portfolio presented as Option A on the recommended slide, Option 7 is the portfolio presented as Option B

©2019 Wilshire Associates.

MARKETABLE ALTERNATIVES

- Wilshire views hedge funds as a dynamic implementation tool used to achieve portfolio objectives, rather than a separate asset class
- Hedge funds are not homogenous and have varying levels of directionality, risk, and liquidity
- Manager structuring and selection is highly dependent on investor objectives, risk tolerances, and governance capabilities

Therefore…

- Instead of "hedge funds", we prefer the term, marketable alternatives
  - Benchmark agnostic strategies and/or funds with investment lives of < 5 years
- Instead of building a diversified portfolio of hedge fund investments (typical mentality), let's invest in a diversified set of strategies to achieve one or more outcomes which are integrated and consistent with the asset allocation policy:
  - Drive returns (Growth)
  - Mitigate specific risk factors or provide uncorrelated sources of return (Diversifiers)

©2019 Wilshire Associates.

DIRECTIONAL AND DIVERSIFYING STRATEGY GROUPS

- Wilshire recommends segregating the hedge fund universe of strategies into **Directional** and **Diversifying** groups

Directional Alternatives

- Strategies that tend to be directionally long risk assets and exhibit higher equity correlations than the global hedge fund index, though some may exhibit lower beta
- Allocations compete with traditional assets in broader portfolio
- Organized into Equity, Credit, and Multi-Asset Class categories

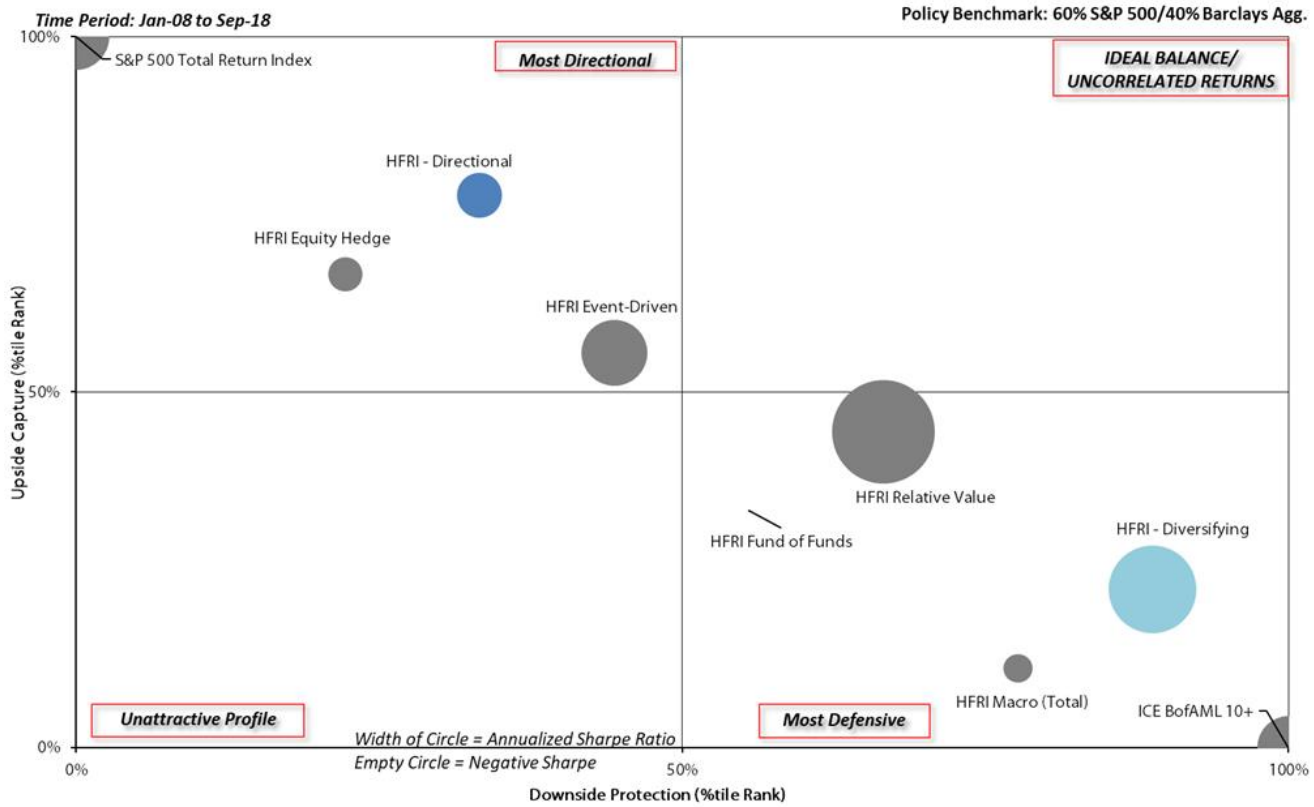
Diversifying Alternatives

- Strategies that rely on relative value opportunities, dynamic directional exposures, or specific market inefficiencies to generate returns.
- Generally low beta AND low equity correlations
  - Low beta/correlation does not necessarily indicate low risk
- Designed to diversify versus Policy over most rolling periods > one year
- Organized into Capital Preservation, Relative Value Arbitrage, Low Correlated Yield, and Dynamic Correlation categories

©2019 Wilshire Associates.

THE ROLE OF MARKETABLE ALTERNATIVES

- The chart below illustrates the role of the HFRI Directional and Diversifying strategies within a simple 60/40 portfolio of equities and bonds.
  - More technically, the Y-axis within the chart represents Wilshire's proprietary upside capture score when the policy benchmark is positive, while the X-axis represents Wilshire's proprietary downside protection score when the policy benchmark is negative.
  - The size of each circle within the chart represents the Sharpe Ratio of that index.



Data source: Hedge Fund Research, Inc.

©2019 Wilshire Associates.

Wilshire Consulting

INFRASTRUCTURE OVERVIEW

TRANSPORTATION	UTILITIES	ENERGY	OTHER
Airports Ports Train stations Toll roads Train lines	Power generation and distribution Water treatment Transmission pipelines	Power generation Renewables Mid-stream operations	Transmission towers Cell towers Cable networks Waste management Industrial infrastructure

INFRASTRUCTURE ASSETS

- Typically long-lived and capital intensive projects with a relatively inelastic demand

KEY CHARACTERISTICS

- Essential services
- High barriers to entry (capital expenditure requirement, regulation)
- Long duration
- High operating margins and inflation linked cash flows

©2019 Wilshire Associates.

INFRASTRUCTURE OVERVIEW

INVESTMENT MERITS

- Low sensitivity to macroeconomic swings
- Low correlation with other asset classes
- High income yield
- Stable and predictable cash flows
- Good inflation protection
- Long-term return potential with limited downside risk
- Diversification

RETURN DRIVERS

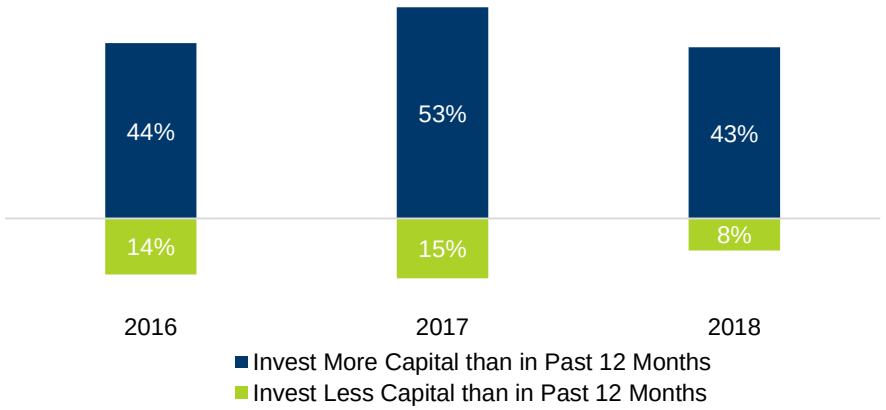
- Steady population growth
- Long-term economic growth
- Increased trade and business activity

©2019 Wilshire Associates.

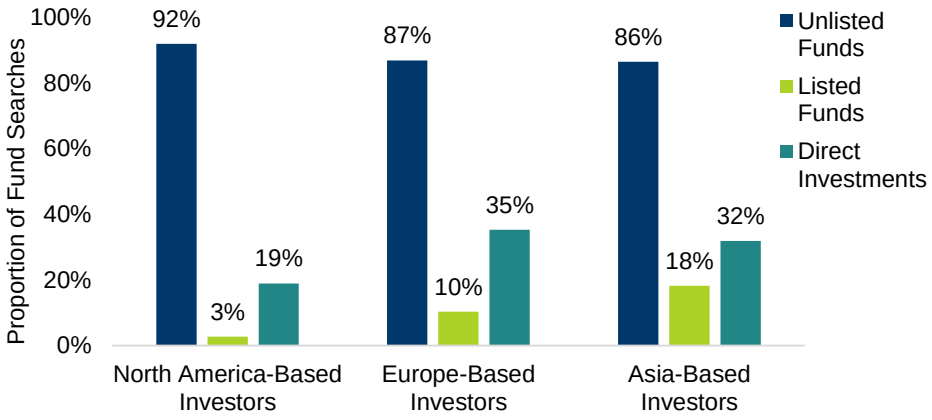
Wilshire Consulting

INVESTOR SENTIMENT

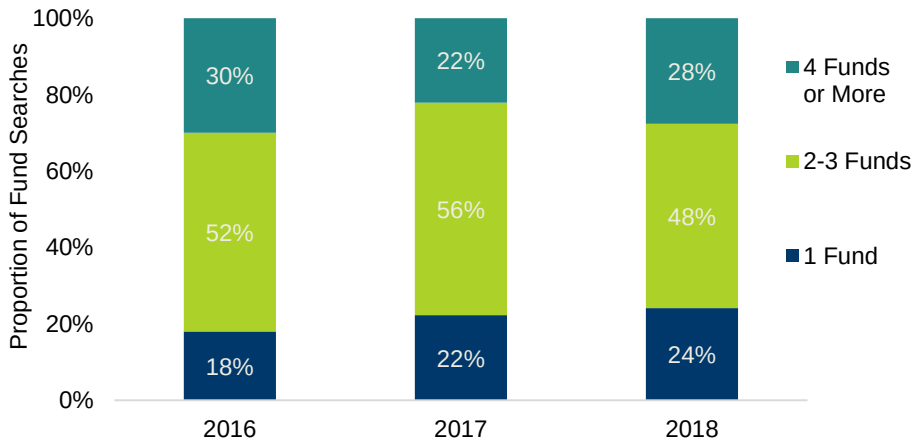
INSTITUTIONAL INVESTORS' PLANS FOR THE NEXT 12 MTHS[1]



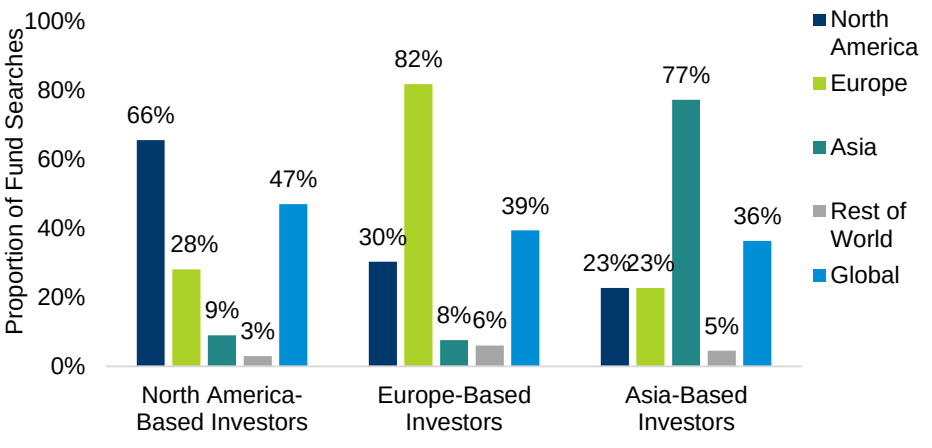
PREFERRED ROUTE TO MARKET OF INFRASTRUCTURE INVESTORS' FOR THE NEXT 12 MTHS[2]



NUMBER OF UNLISTED INFRASTRUCTURE FUNDS INVESTORS PLAN TO COMMIT TO IN THE NEXT 12 MONTHS[2]



REGIONS TARGETED BY INFRASTRUCTURE INVESTORS IN THE NEXT 12 MONTHS[2]



[1] Preqin Investor Update: Alternative Assets H2 2018.
[2] Preqin Quarterly Update: Infrastructure, Q3 2018.

©2019 Wilshire Associates.

Listed Infrastructure Universe

Product Name
AMP Capital Global Listed Infrastructure Securities
4D Global Infrastructure Fund
BlackRock Global Listed Infrastructure Fund
CDN Global Infrastructure
Brookfield Global Infrastructure Securities Core Strategy
Global Infrastructure Securities Strategy
Global Infrastructure Securities Strategy and MLPs
CBRE Clarion Global Listed Infrastructure Strategy
CenterSquare Global Infrastructure Strategy
Cohen & Steers Global Listed Infrastructure
Cohen & Steers Global Listed Infrastructure Focus (Dow Jones Brookfield)
Cohen & Steers Global Listed Infrastructure Focus (FTSE 50/50)
Global Listed Infrastructure
Columbia Global Infrastructure
Global Listed Infrastructure
Deutsche Global Infrastructure Securities
Dynamic Global Infrastructure
Global Listed Infrastructure Strategy
Franklin Real Asset Advisors Global Listed Infrastructure
Global Infrastructure
Greystone Infrastructure Global Master - USD
Global Infrastructure
KBIGI Global Sustainable Infrastructure Strategy
Global Listed Infrastructure (Unhedged)
Global Listed Infrastructure (USD Hedge)
Global Core Infrastructure
Macquarie Global Listed Infrastructure Securities
Macquarie Hedged Index Global Infrastructure Securities Fund
Macquarie True Index Global Infrastructure Securities Fund
Magellan Core Infrastructure Strategy
Magellan Select Infrastructure Strategy
Maple-Brown Abbott Global Listed Infrastructure Strategy
MFS Global Infrastructure
Miller/Howard Infrastructure
Global Infrastructure Securities
Infrastructure Plus
Global Infrastructure
RARE Emerging Markets Strategy
RARE Infrastructure Income Strategy
RARE Infrastructure Value Strategy
RITC Global Listed Infrastructure Fund
Sun Life Sentry Infrastructure Fund I
Global Infrastructure Dividend Focus Equity
Vanguard Global Infrastructure Fund
Vanguard Global Infrastructure Fund (Hedged)
Ve-RI Listed Infrastructure I
Enduring Assets
Whitehelm Listed Core Infrastructure Fund

Universe

- 75 securities in the S&P Global Infrastructure Index
- Transportation, Utility, and Energy sector exposure
- Regional Exposure vs the MSCI ACWI:
  - Overweight Europe
  - Underweight U.S.
  - Underweight EM
- European names are higher vol, low momentum
- U.S. names are lower vol, higher momentum
- Approx. 50 strategies in the universe

©2019 Wilshire Associates.

IMPORTANT INFORMATION

This material contains confidential and proprietary information of Wilshire Associates Incorporated (Wilshire), and is intended for the exclusive use of the person to whom it is provided. It may not be disclosed, reproduced or redistributed, in whole or in part, to any other person or entity without prior written permission from Wilshire. Third party information contained herein has been obtained from sources believed to be reliable. Wilshire gives no representations or warranties as to the accuracy of such information, and accepts no responsibility or liability (including for indirect, consequential or incidental damages) for any error, omission or inaccuracy in such information and for results obtained from its use. Information and opinions are as of the date indicated, and are subject to change without notice.

This material is intended for informational purposes only and should not be construed as legal, accounting, tax, investment, or other professional advice.

This report may include estimates, projections and other "forward-looking statements." Due to numerous factors, actual events may differ substantially from those presented.

Wilshire® is a registered service mark of Wilshire Associates Incorporated, Santa Monica, California. All other trade names, trademarks, and/or service marks are the property of their respective holders.

Copyright © 2019 Wilshire Associates Incorporated. All rights reserved.