#### Common Investment Meeting (BERS)

<b>Schedule</b> Wednesday, June 21, 2017, 09:00 AM — 02:00 PM EDT			
Venue	Office of the New York City Comptroller, 1 Centre Street, 10th Floor (Room 1005) - Northside, New York, NY 10007		
Organizer	Kim Boston		
Agenda			
PUBLIC SE	SSION 1		
9:00 AM	Welcome and Opening		
9:10 AM	Performance Reporting:       2         Total Fund Performance Overview (Public)       2         Performance Reporting 06 21 17 pdf       2		
9:55 AM	Performance Reporting_06_21_17.pdf       3         Discussion: Summer Seminars       37		
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SUPPLEMENTAL MATERIAL (Non-Investment Public)	
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Private Equity Quarterly Report a/o December 31, 2016:	403
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Real Assets Quarterly Report a/o December 31, 2016:	434

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Liquidity Analysis	
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# PUBLIC SESSION

#### Performance Reporting: Total Fund Performance Overview (Public)

# QUARTERLY PERFORMANCE OVERVIEW Q1 2017

## Market Returns: Q1-2017

Asset Class	Index	First Quarter 2017	Fourth Quarter 2016	Fiscal Year To Date	3 Year	5 Year
Equities - U.S.	Russell 3000	5.7%	4.2%	15.0%	9.8%	13.2%
Equities - Developed Intl	MSCI EAFE	7.3%	-0.7%	13.3%	0.5%	5.8%
Equities - Emerging Intl	MSCI EMF	11.4%	-4.2%	16.4%	1.2%	0.8%
Debt – UST Long Duration	Citigroup Treasury 10+	2.6%	-11.7%	-9.6%	5.8%	3.5%
Debt - US Government	NYC Treas/Agency +5	1.1%	-7.3%	-6.8%	3.8%	2.7%
Debt - Investment Grade	NYC IG Credit	1.4%	-3.1%	-0.4%	3.5%	3.7%
Debt - High Yield	Citigroup BB & B	2.3%	1.6%	9.2%	4.1%	6.2%

\*Average of consultant long-term arithmetic expected returns, as of 2016

Source: State Street



## Q1 Themes

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#### 1) US Q1 GDP Weakness



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#### Q1 Themes

# 2) Developed Market Interest Rates – Inflation declining, Yields lower

• US/Federal Reserve

March 14 FOMC – "Dovish" rate hike

• Europe/European Central Bank

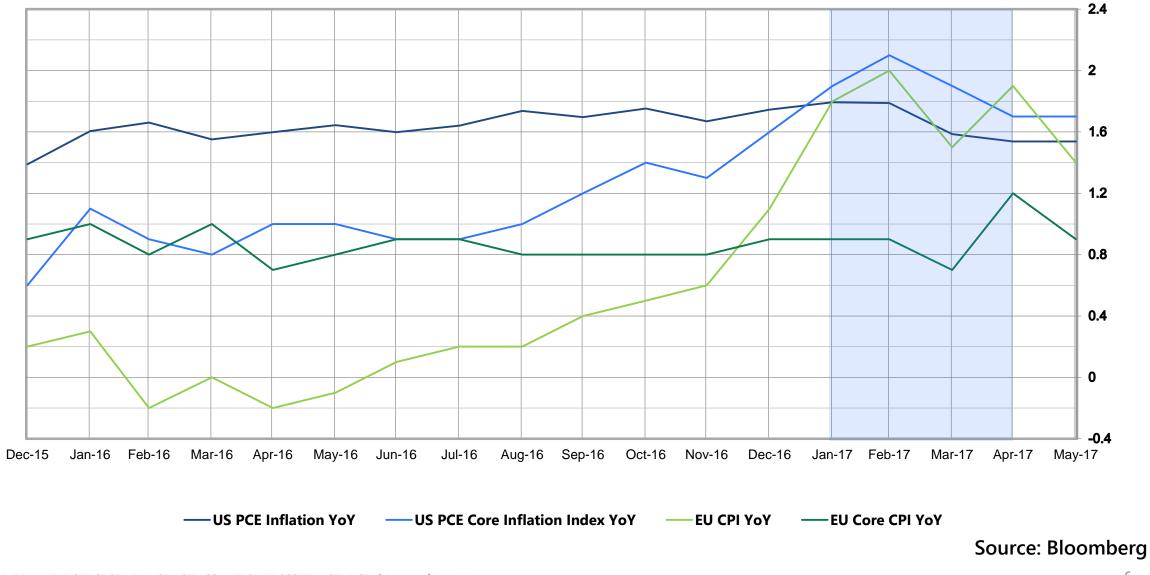
March 9 ECB meeting – "No evidence of a convincing upward trend in underlying inflation"



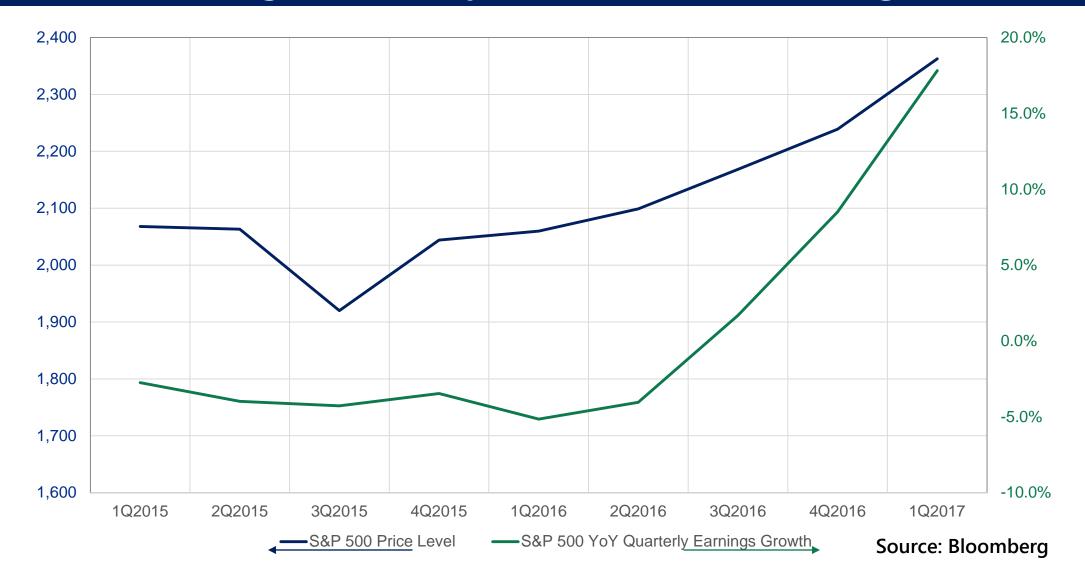


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#### **US and European Inflation**

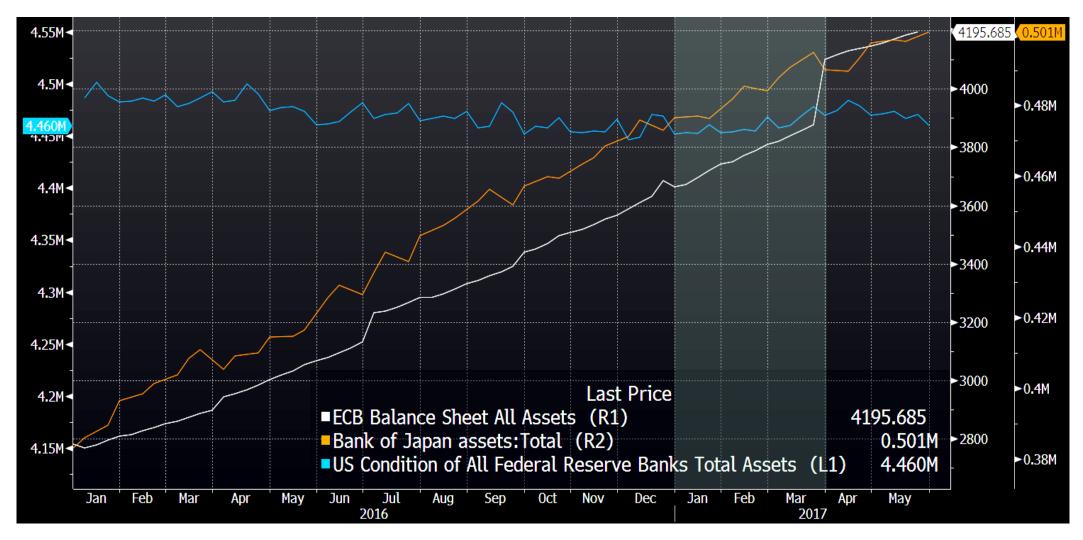


## Stronger than expected S&P 500 Earnings



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# **Continued Global Central Bank Balance Sheet Expansion**

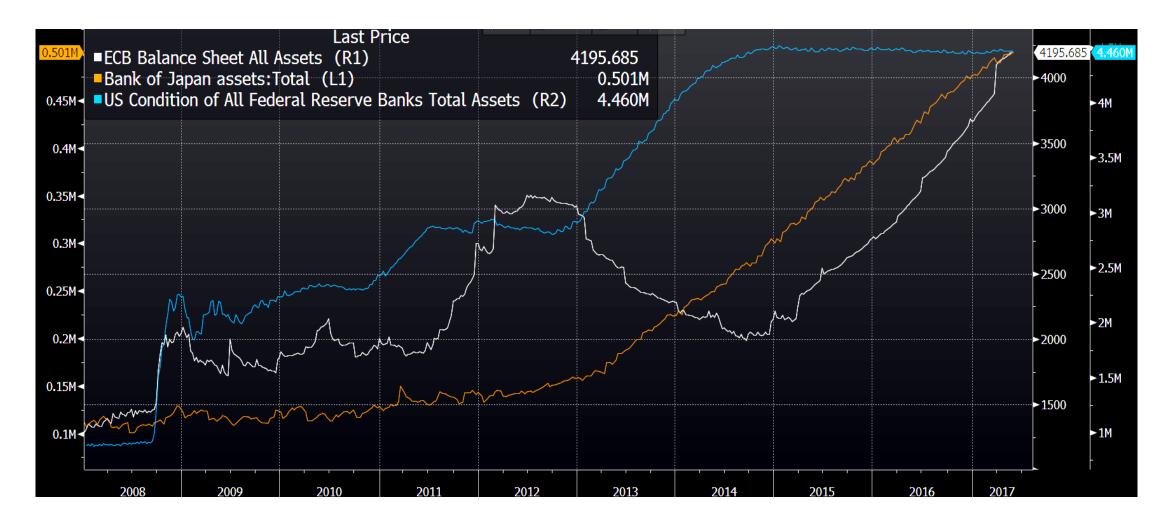


Source: Bloomberg



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# **Continued Global Central Bank Balance Sheet Expansion**



Source: Bloomberg

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## **Current Global Macro Issues**

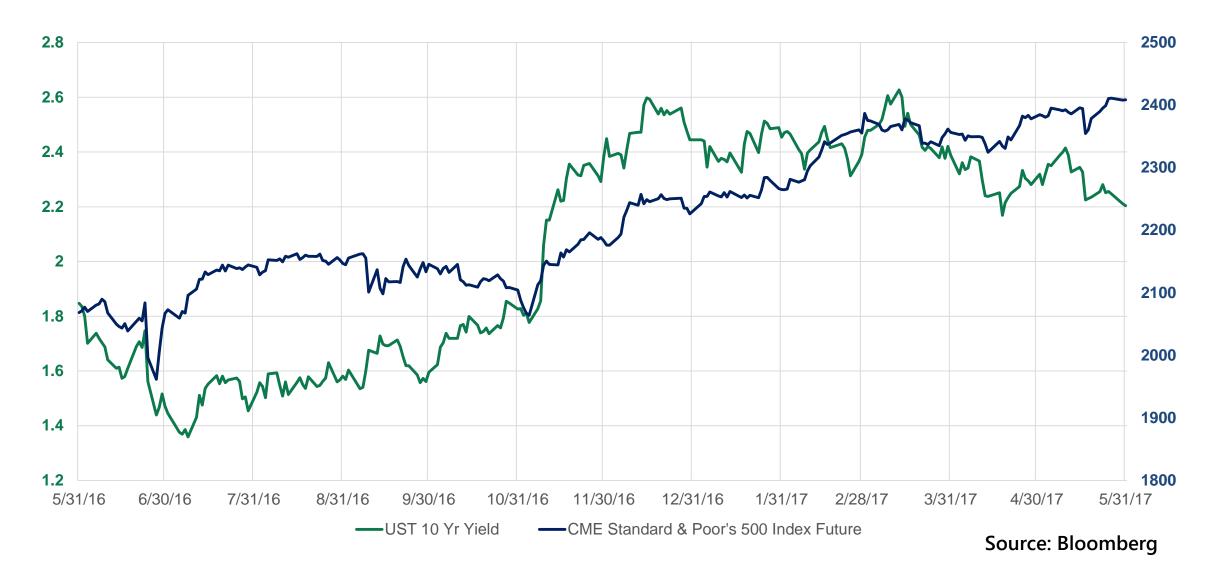
Domestic:

- -Probability, timing and specifics of US tax and spending plans
- -Divergence between S&P 500 and UST 10 Year Yields
- -Federal Reserve Pace and magnitude of interest rate increases; Impact of Fed's balance sheet reduction

International:

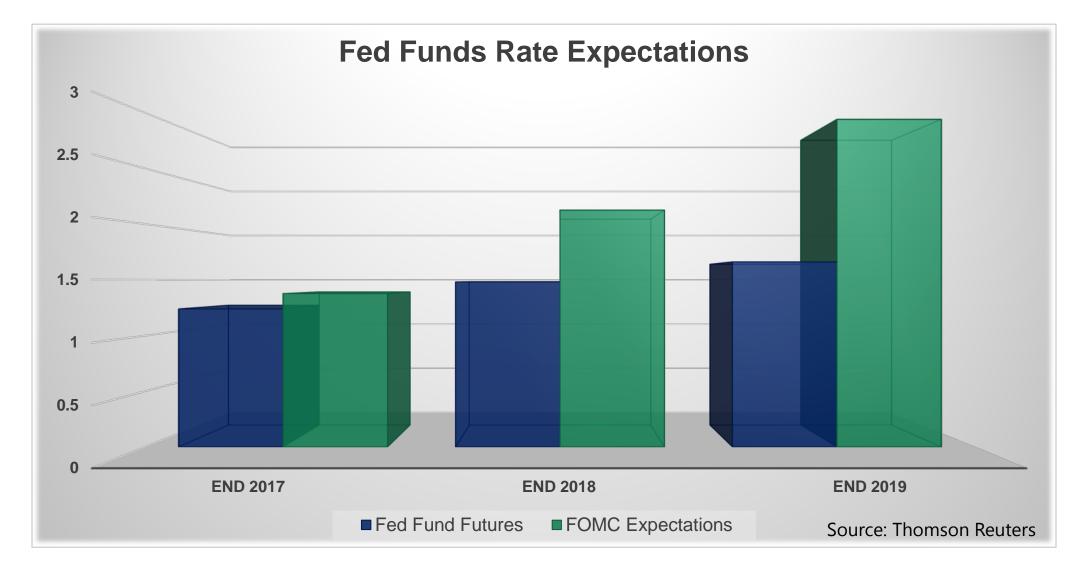
- -UK-EU separation negotiations
- -German election (anticipated fall of '17)
- -Italian election (either fall of '17 or spring of '18) and Italian banking system concerns
- -North Korea concerns
- -Middle East concerns
- -ECB and BOJ exit from current extraordinarily accommodative monetary policy
- -Global terrorism





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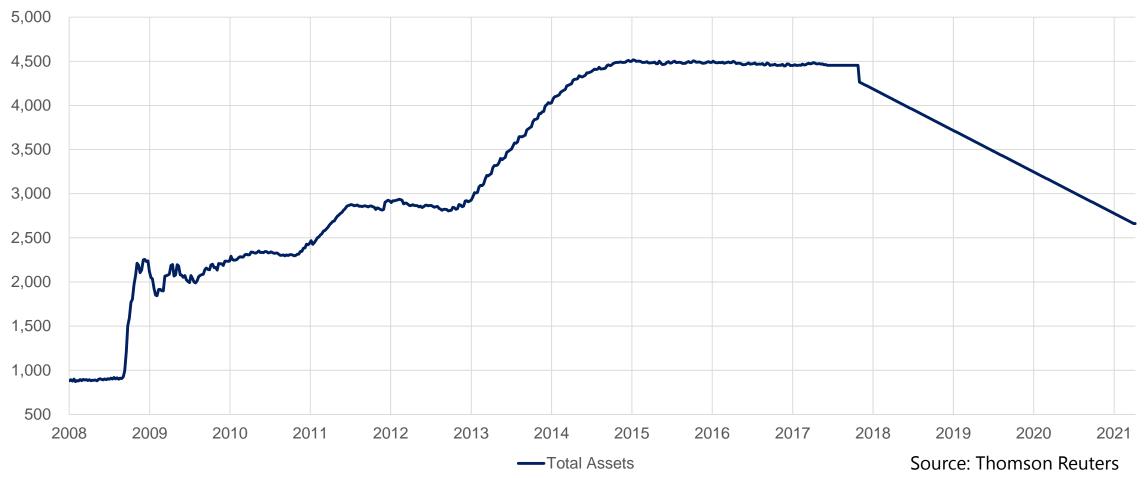
#### Fed Fund Futures and FOMC Expectations





## Fed's Asset Holdings

Fed Asset Holdings (in billions)



6

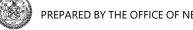
#### Total NYC Pension Fund Performance as of 3/31/2017

#### (SSB B p.3; N, T, F p.7; P p.9)

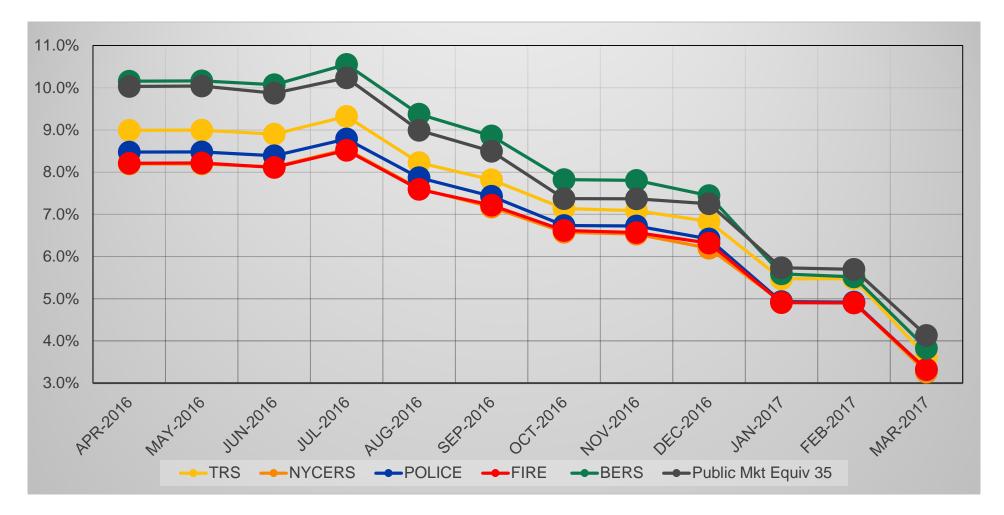
NYC Pension System	Portfolio Std Dev - 1 yr	1st Quarter	FYTD	One Year	Three Year
BERS	3.83%	5.34%	11.32%	13.62%	6.19%
TRS	3.62%	4.88%	9.32%	11.72%	5.94%
FIRE	3.33%	4.65%	9.47%	11.62%	6.06%
POLICE	3.32%	4.67%	9.94%	12.11%	6.31%
NYCERS	3.26%	4.61%	9.74%	11.98%	6.06%
Median Fund - TUCS		4.28%	9.16%	11.65%	5.94%
PME 35 (43% R3000 + 22% MSCl EAFE + 35% BBG Barclays Aggr.) 🛛		4.34%	8.62%	10.36%	5.36%

Net of fees in public asset classes

Source: State Street



#### **Standard Deviation – 1 Year**

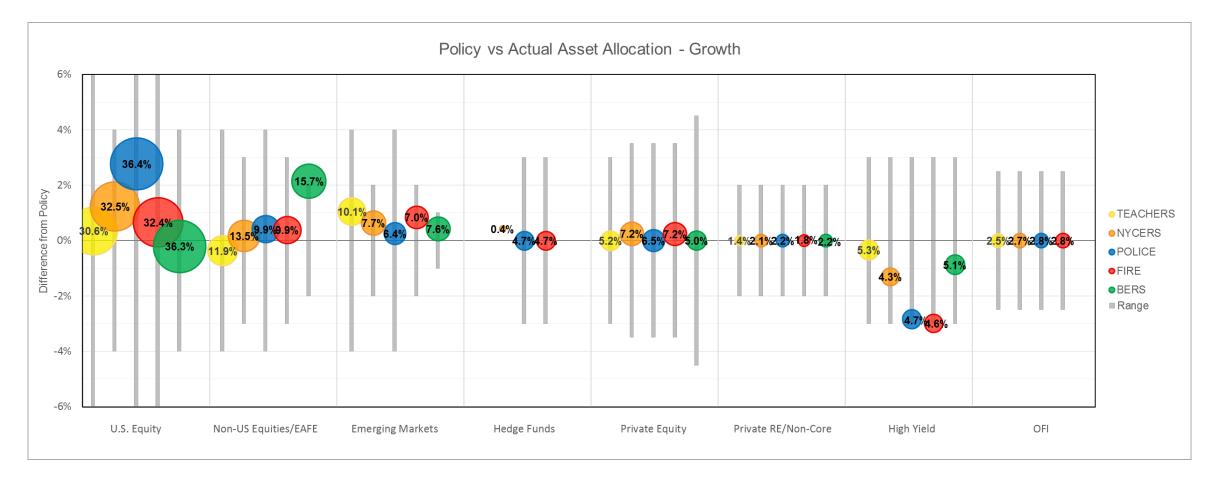




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#### Asset Allocation First Quarter 2017 - Growth

Relative Mix to Adjusted New Policy Weights (SSB F, T, N p.8; P p.10; B p.12)



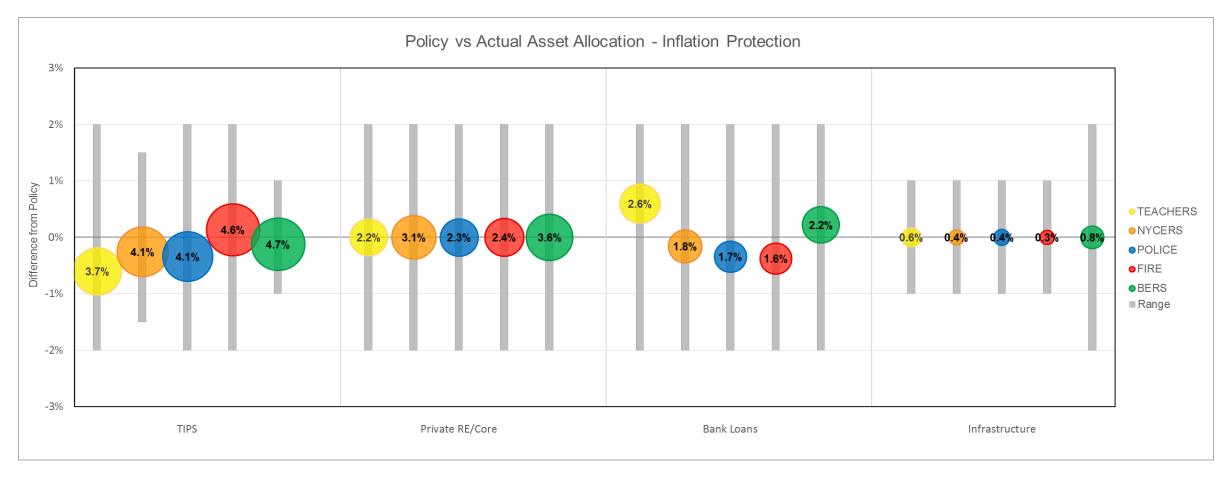
Source: State Street



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#### Asset Allocation First Quarter 2017 – Inflation Protection

Relative Mix to Adjusted New Policy Weights (SSB F, T, N p.8; P p.10; B p.12)



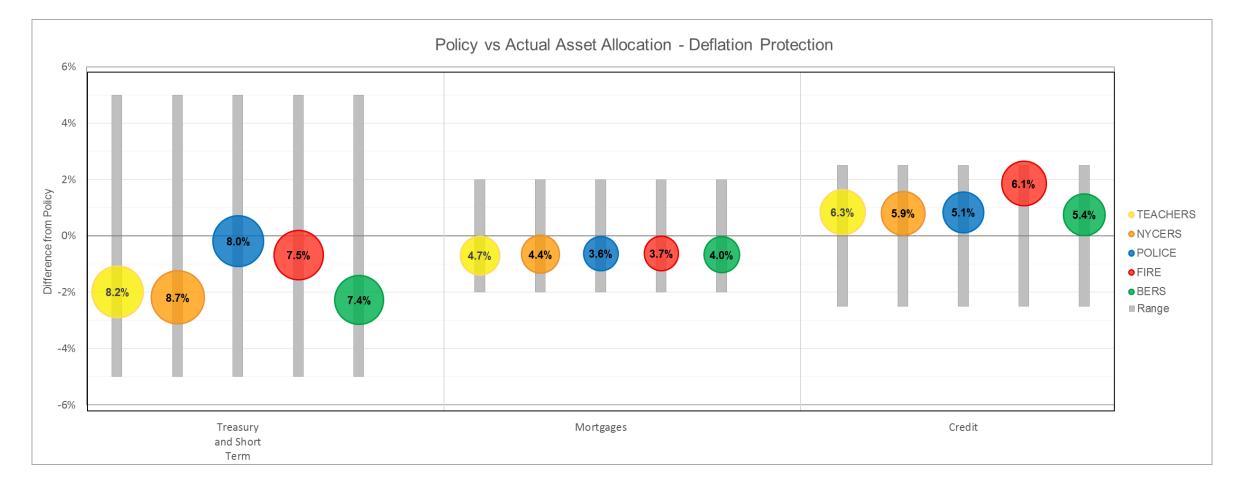
Source: State Street



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#### **Asset Allocation First Quarter 2017 - Deflation Protection**

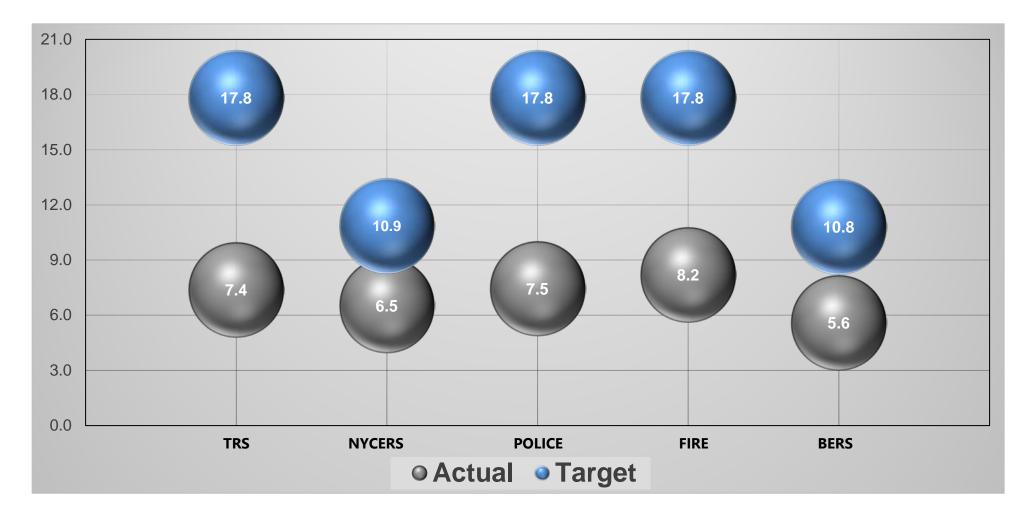
Relative Mix to Adjusted New Policy Weights (SSB F, T, N p.8; P p.10; B p.12)



Source: State Street

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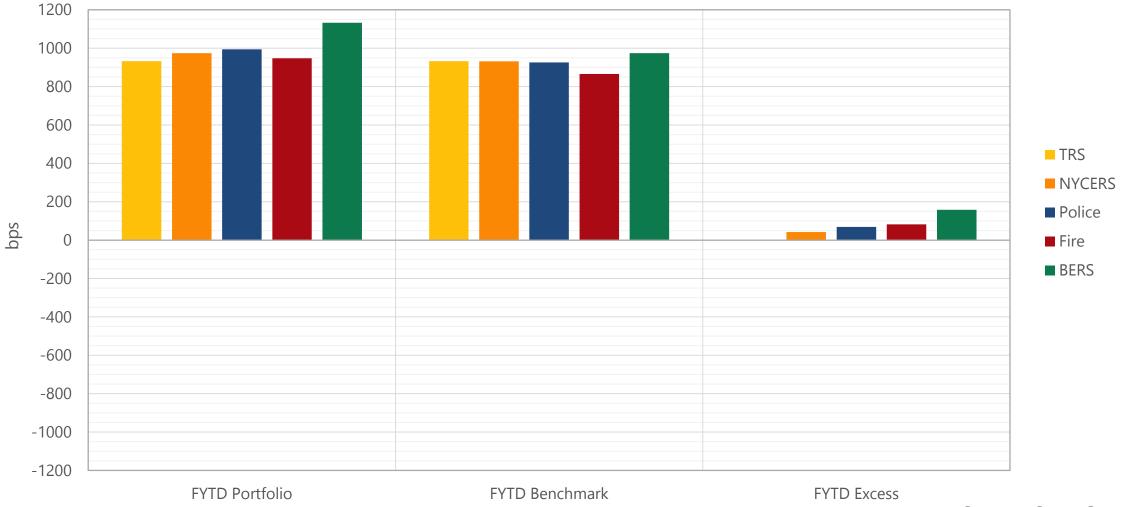
#### **Treasury Duration Actual Vs. Target**



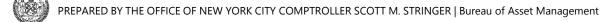
Source: State Street

#### Fiscal Year to Date Return – Total Portfolio

Basis Points of Excess Return (SSB T, N, F p.15; P p.17; B p.19)

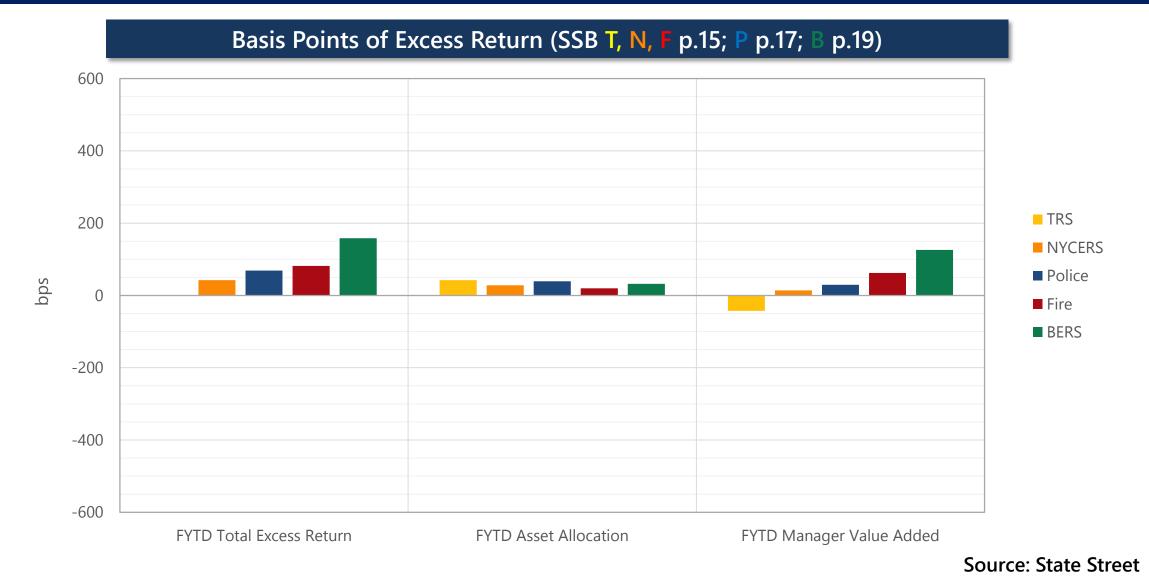


Source: State Street



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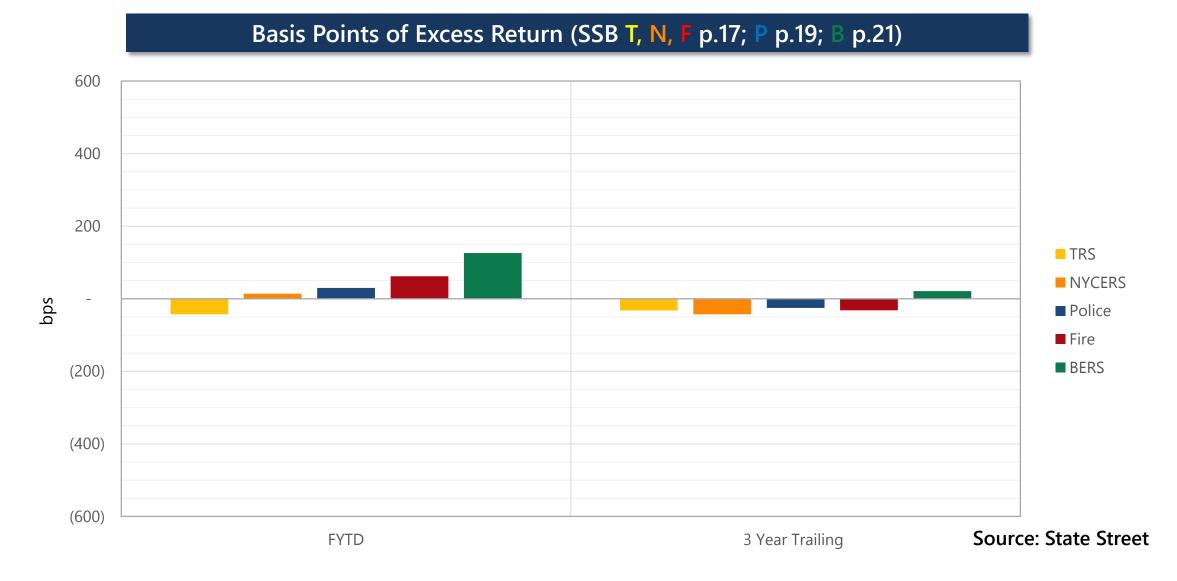
## Fiscal Year to Date Excess Return – Total Portfolio



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# Fiscal Year to Date Manager Value Added - Total Portfolio



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#### Value Added – Total U.S. Equities

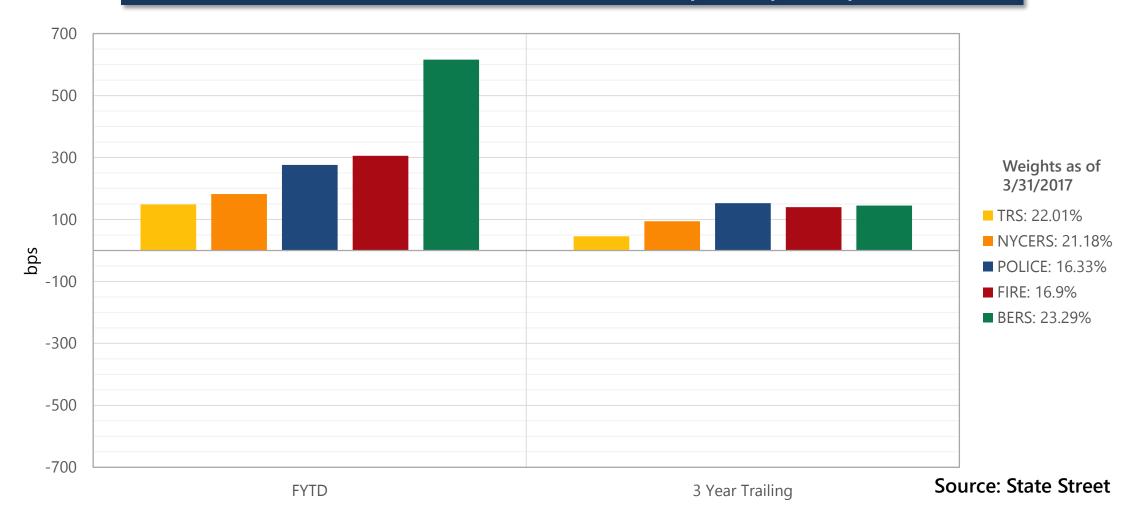
Basis Points of Excess Return (SSB N, F, T p.27; P p.29; B p.31)



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## Value Added – Total International Equities

Basis Points of Excess Return (SSB N, F, T p.29; P p.31; B p.33)



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#### Value Added – Structured Fixed Income

Basis Points of Excess Return (SSB T p.32; N, F p.33; P, B p.33)



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# Value Added – High Yield

Basis Points of Excess Return (SSB T p.32; N, F p.33; P, B p.33)



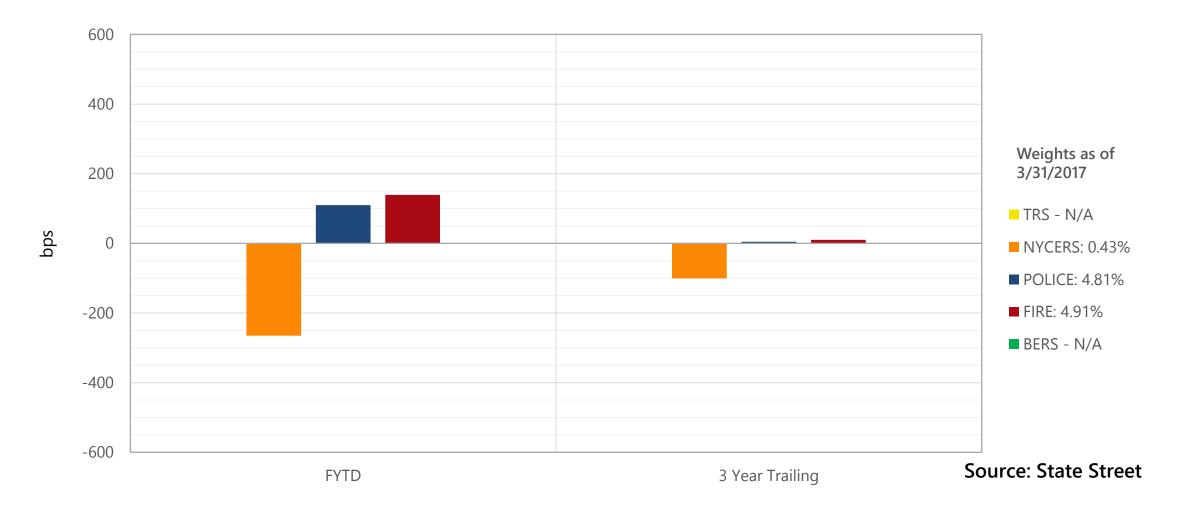
#### Value Added – Bank Loans





#### Value Added - Hedge Funds

Basis Points of Excess Return (SSB F p.56; N p.58; P p.60)

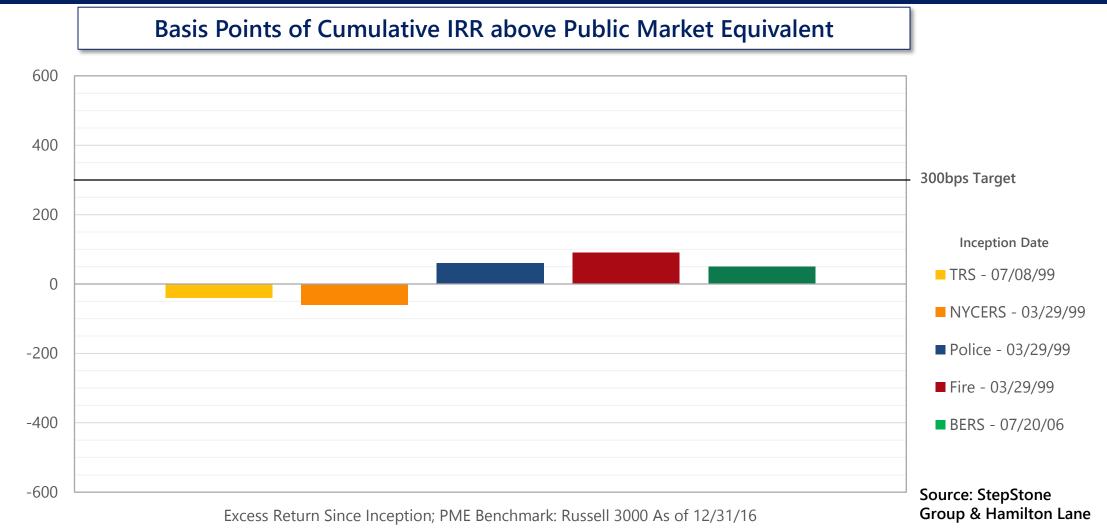


# PRIVATE MARKET DATA



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## Value Added – Private Equity

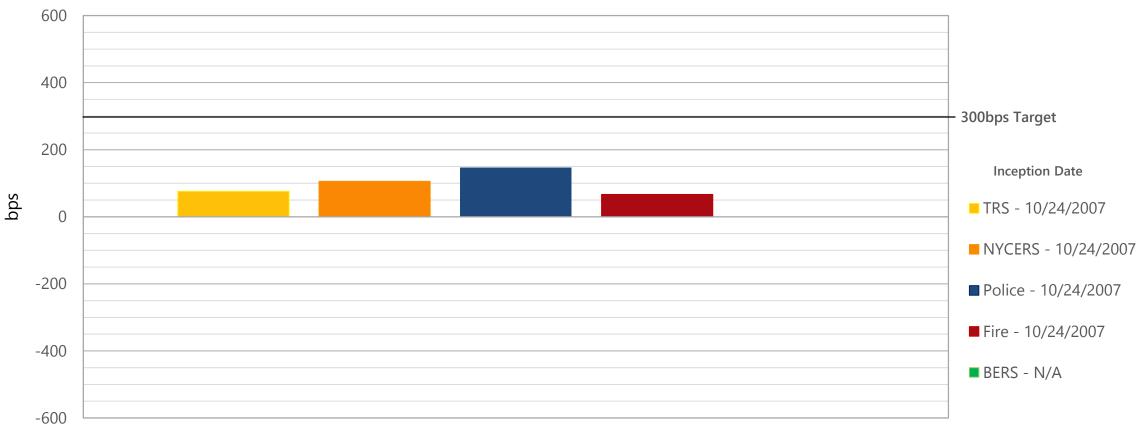


The PME Spread is the difference between the IRR and the PME Benchmark.

bps

# Value Added – Opportunistic Fixed Income (OFI)

Basis Points of Cumulative IRR above Public Market Equivalent



Excess Return Since Inception; PME Benchmark: 50% JP Morgan Global High Yield 50% CS Leveraged Loans as of 3/31/17

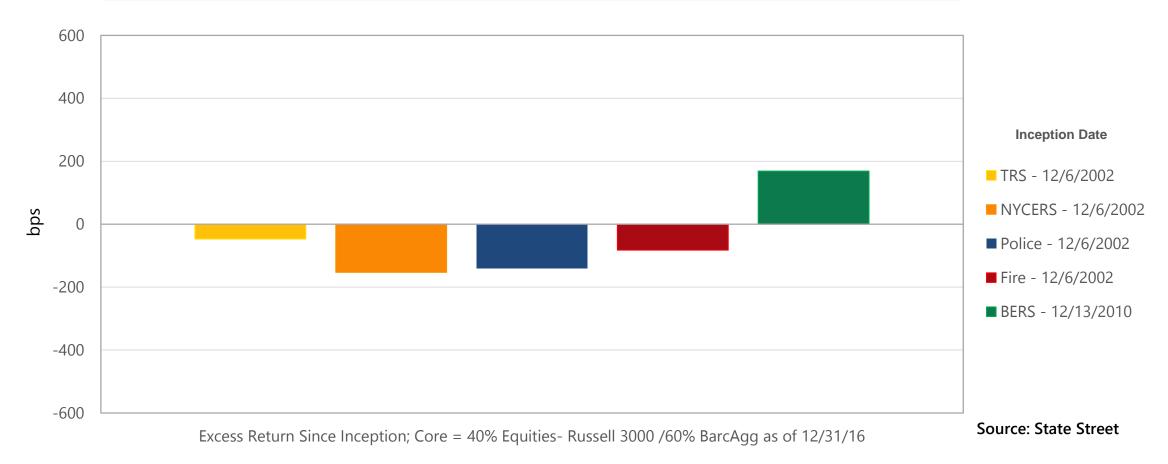
Source: State Street

#### The PME Spread is the difference between the IRR and the PME Benchmark.

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#### Value Added – Private Real Estate - Core

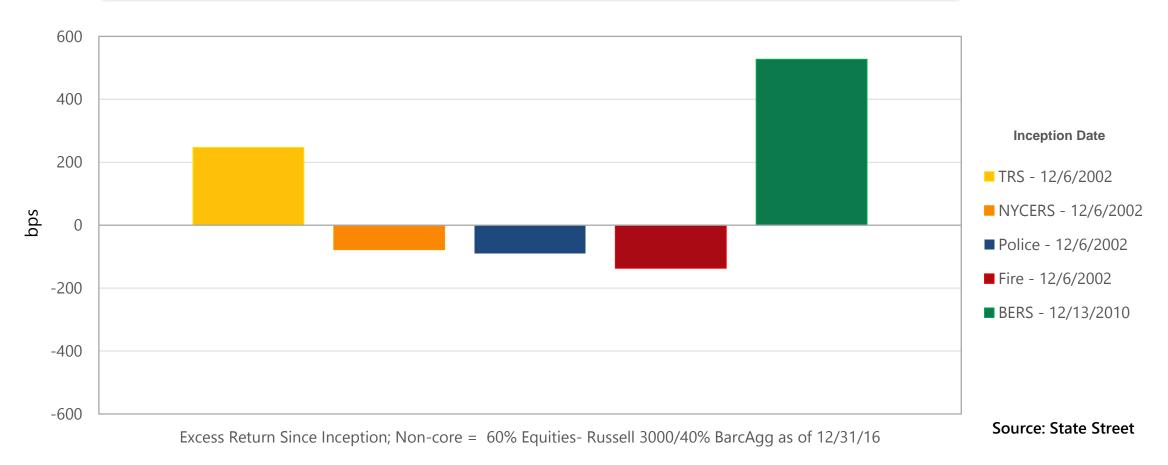




The PME Spread is the difference between the IRR and the PME Benchmark.

# Value Added – Private Real Estate – Non-Core

Basis Points of Cumulative IRR above Public Market Equivalent

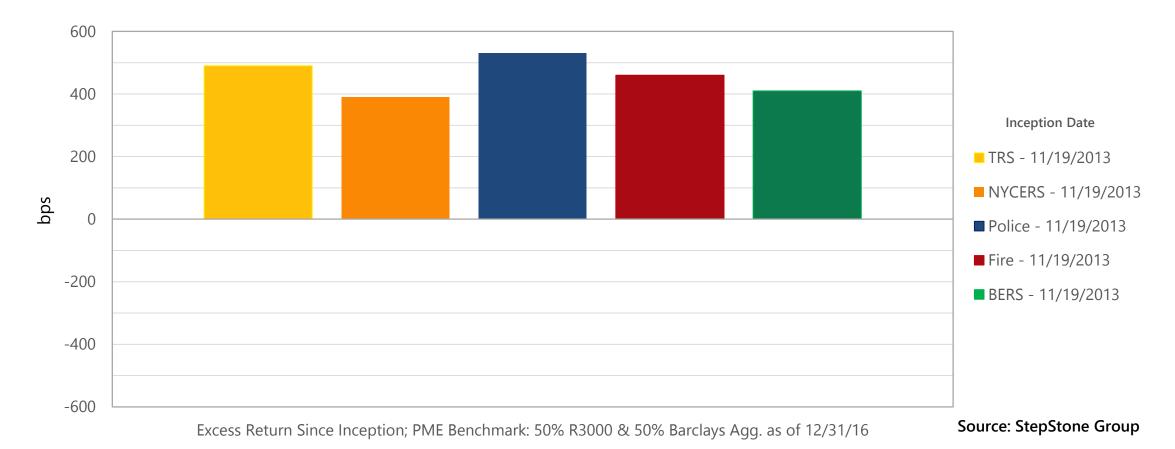


The PME Spread is the difference between the IRR and the PME Benchmark.

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# Value Added - Infrastructure

Basis Points of Cumulative IRR above Public Market Equivalent



The PME Spread is the difference between the IRR and the PME Benchmark.

# **Questions?**

**Discussion: Summer Seminars** 

DISCUSSION Summer Seminars

# **Summer Seminar Topics**





# SUPPLEMENTAL MATERIAL (Non-Investment Public)

Performance Reporting:

**Total Fund Overview - Public:** 





New York City Board of Education Retirement System Performance Overview as of March 31, 2017

# **Total Fund Overview**

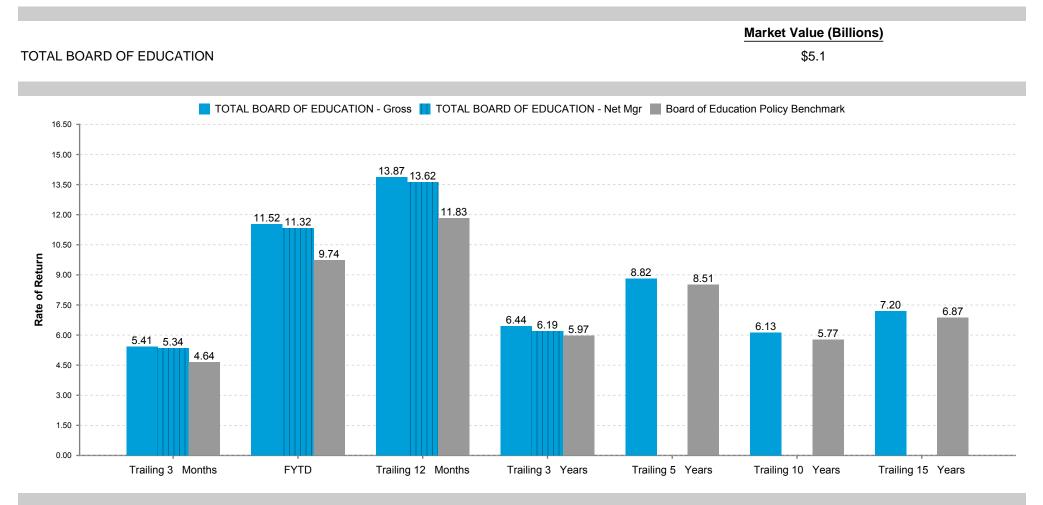


# New York City Board of Education Retirement System

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<b>Consultant's Commentary &amp; Performance Charts</b>	<b>p.3</b>
Appendix A - Consolidated Performance Report	<b>p.30</b>
Appendix B - Public Markets Manager Performance Detail	<b>p.37</b>
<b>Appendix C - Alternative Assets Manager Performance Detail</b>	<b>p.44</b>
Appendix D - Footnotes	<b>p.49</b>





	Plan 3 Years	Benchmark 3 Years	Plan 5 Years	Benchmark 5 Years	Plan 10 Years	Benchmark 10 Years
Standard Deviation						
TOTAL BOARD OF EDUCATION	7.2	6.8	8.8	7.0	11.3	11.7

Through March 31, 2017



#### New York City Board of Education Retirement System (BERS)

Consultant's Commentary – Through March 31, 2017

#### Total Fund Performance

The Board of Education Retirement System (BERS) Total Fund returned +5.34% net of fees for the quarter ended March 31, 2017, versus the policy benchmark's return of +4.62%. For the fiscal year as of March 31, 2017, the Total Fund returned +11.32% net of fees, versus the benchmark return of +9.73%. The selection of active management in developed and emerging international markets helped as did having a high yield bond allocation versus core bonds.

#### Total Fund Asset Allocation

As of March 31, 2017, the BERS Total Fund had \$5.10 billion, up from \$4.83 billion at December 2016. The fund is overweight to U.S. equities by +6.3% and to non-U.S. stocks by +2.7%. Part of our equity overweight is as a holding place for not yet invested Private Equity , Infrastructure and Real Estate assets. Those asset classes are underweight. High Yield is a modest .9% underweight , we are going through a high yield manager search and may rebalance among our managers. The attribution analysis shows that selection was more responsible for value added than was allocation in the quarter.

This occurs when individual managers add value versus their benchmark but the total allocation to that asset class does not add value. Since we are primarily indexed in U.S. equities, it is difficult, net of fees, to outperform by a significant margin in our major asset class. The total asset allocation is in line with the targets and ranges approved by the Trustees. Recent manager selection approvals in Private Equity and Infrastructure will bring us in line with the FY 2017 implementation plan.

#### Active U.S. Equity Commentary

As of March 31, 2017, U.S. Equity was \$1.85 billion (36.3%) of the NYBERS Total Fund. The U.S. equity composite was positive in the first quarter returning +5.73%. This performance was in line with the R3000 index return of +5.74%.



#### Active U.S. Equity Managers

• *Wellington* returned +6.18% in the quarter versus +3.94% for S&P Midcap 400 index. For the fiscal year as of March 31, 2017, Wellington returned +15.96% versus +16.28% for the S&P Midcap 400 index. The manager had been lagging the benchmark , partially due to their focus on fundamental stock selection and the market focus on higher risk low quality. We feel this performance is more reflective of their strategy.

• Stock selection was strong in the health care and industrials sectors, while modest overweight to the energy sector detracted.

• The leading contributor during the first quarter was ARIAD Pharmaceuticals, a biotech company focused on rare blood cancers.

• One of the top detractors during the first quarter was CarMax, the largest used car retailer in the US. The company's stock price fell as a result of a decline in used car prices.

#### International Equity Commentary

As of March 31, 2017, Developed International Equity was \$800.8 million (15.7%) of the NYBERS Total Fund. Non-U.S. stocks returned +10.08% in the first quarter versus +7.35% for the MSCI EAFE.

#### Active International Equity Managers

• *Sprucegrove* returned +8.09% in the quarter versus +6.05% for the MSCI EAFE Value, net index. For the fiscal year as of March 31, 2017, Sprucegrove returned +20.17% versus +19.31% for the MSCI EAFE Value, net index.

• The Fund continues to represent high quality with a projected ROE of 14.3%, which is higher than the EAFE index at 11.0% and financial leverage of 2.2x, which is below the EAFE index at 2.7x. The Fund at a normalized P/E of 13.2x, 1.9x P/B and a 2.9% dividend yield is attractively valued.

• Over the quarter, the largest positive returns in the developed markets were from Spain (+14.8%), Singapore (+13.5%) and Hong Kong (+13.4%).



• The Fund benefitted from holdings in the more cyclically sensitive Energy, Materials and Information Technology sectors, contrary to last year. The Fund also benefitted from having less exposure to the more defensive (yet weaker) sectors, such as Health Care and Consumer Staples.

• The top 10 holdings represent +23.3% of the portfolio.

• *Baillie Gifford* returned +12.22% in the quarter versus +8.52% for the MSCI EAFE Growth, net index. For the fiscal year as of March 31, 2017, Baillie Gifford returned +18.07% versus +7.60% for the MSCI EAFE Growth, net Index.

- Softbank, a telecom operator and technology investor, was the portfolio's largest holding at +5.1%.
- At quarter end, the portfolio had +14.9% invested in emerging markets.
- The top 10 holdings represent +39.9% of the portfolio.

• *Acadian* outperformed for the quarter, +10.03% versus +8.04% for the S&P EPAC Small Cap Index. Acadian also outperformed for the fiscal year as of March 31, 2017, +16.98% versus +13.18% for the S&P EPAC Small Cap Index.

• Gains realized from stock selection were joined with value added from country allocations. Key sources of positive active return included a combination of stock selection and an overweight position in China, a combination of stock selection and an underweight position in the U.K., and an opportunistic exposure to Taiwan. Opportunistic exposures to Canada and South Africa detracted from return, as did an overweight position in Norway.

• At quarter end, the portfolio's emerging markets exposure was 10.7%. The portfolio held 1,136 stocks.

#### **Emerging Markets Equity Commentary**

As of March 31, 2017, Emerging Markets Equity was \$386.2 million (7.6%) of the NYBERS Total Fund. Emerging Markets outperformed for the quarter, +14.04% versus +11.44% for the MSCI Emerging Markets, net Index. Emerging Markets also outperformed for the fiscal year as of

Through March 31, 2017



March 31, 2017, +22.96% versus +16.44% for the MSCI Emerging Markets, net Index. Blackrock was a new Emerging Markets manager beginning December, 2016.

#### **Emerging Markets Equity Managers**

• *Acadian* outperformed for the quarter, +14.93% versus +11.44% for the MSCI Emerging Markets, net Index. Acadian also outperformed for the fiscal year as of March 31, 2017, +24.15% versus +16.44% for the MSCI Emerging Markets, net Index.

• Gains realized from stock selection were joined with value added from country allocations. Key sources of positive active return included a combination of stock selection and an overweight position in India, an underweight position in Russia, and stock selection in China. A combination of stock selection and an underweight position in Mexico was less successful, as was stock selection in Malaysia and South Africa.

• CONY GT EM BlackRock outperformed for the quarter, +11.66% versus +11.44% for the MSCI Emerging Markets, net Index.

#### Emerging Manager Program

The Total Emerging Manager Program (Progress and FIS) returned +4.29% for the quarter versus +4.10% for the index. For the fiscal year as of March 31, 2017, the return was +17.89% versus +18.36%. This program is being restructured away from the Russell 3000 benchmark structure (terminating Progress) and toward small cap (Legato) and International (FIS) as approved by the Trustees. We will provide more detail next quarter on the new structure.

#### Fixed Income – Structured Manager Composite Commentary

As of March 31, 2017, The Total Structured Portfolio was \$757.5 million (14.9%) of the NYBERS Total Fund. Structured Fixed Income returned +1.06% in the first quarter versus +0.99% for the benchmark. For the fiscal year as of March 31, 2017, Structured Fixed Income returned -1.08% versus -1.99% for the benchmark. SSgA 1 -3 Yr. Treasury Index was a new manager beginning January, 2017.



#### Fixed Income – Structured Manager Composite Managers

• *BlackRock (mortgages)* returned +0.68% in the quarter, outperforming the Citigroup Mortgage index return of +0.43%. For the fiscal year as of March 31, 2017, BlackRock (mortgages) returned -0.32% versus -1.00% for the Citigroup Mortgage index.

• The mortgage basis as measured by FNMA 3.5s closed the month a couple ticks tighter to Treasuries, marginally weakening prior to the FOMC mid-month and slowly tightening into quarter-end. Despite a range bound rate market and a downtrend in volatility, performance across mortgage expressions was lackluster. Coupon swaps were slightly weaker during the month. G2/FN swaps had a somewhat volatile month, widening more than a quarter point intra-month as concerns over the absence of overseas demand plagued the sector but the swaps closed the month marginally weaker. TBA valuations (OAS) are little changed on the month and remain at the wides of the year-to-date range. The market remains focused on the recent absence of real money demand (overseas and banks), the potential for strong supply to persist, and the looming Fed decision to taper MBS reinvestments.

• *Prudential (credit)* returned +1.29% in the quarter, underperforming the Investment Grade Credit index return of +1.38%. For the fiscal year as of March 31, 2017, Prudential (credit) returned -0.27% versus -0.37% for the Investment Grade Credit index.

• *PRIVEST (credit)* returned +1.68% in the quarter versus +1.38% for the Investment Grade Credit index. For the fiscal year as of March 31, 2017, PRIVEST (credit) returned +1.01% versus -0.37% for the Investment Grade Credit index.

• Quarterly credit migration included five issuer upgrades (\$47.1 million market value) and five issuer downgrades (\$94.1 million market value).

• PRIVEST committed to purchase \$90.1 million of private placements during the first quarter at a weighted average spread, coupon, credit quality and average life of 147 basis points, 3.75%, BBB, and 9.41 years, respectively.

• Optional prepayment activity totaled \$58.6M and included one full and one partial paydown, resulting in market value gains of \$1.0M.

• *SSgA (governments)* returned +1.23% in the quarter, outperforming the +1.09% return for its NYC - Treasury Agency plus five index benchmark. For the fiscal year as of March 31, 2017, SSgA (governments) returned -6.56% versus -6.75% for the NYC - Treasury Agency plus five index.

Through March 31, 2017



• U.S. high yield spreads continued to grind lower by 26 basis points in the early months of 2017 to near cycle lows last seen in 2014. Since peaking at almost 8.5% in February 2016, high yield spreads have now tightened by over 450 basis points cumulatively. An increase in option adjusted spreads on the Bloomberg Barclays U.S. High yield index in March to close the quarter at 3.8% was notable as it was the first increase after 8 consecutive months of decline. Investment grade spreads in contrast, were mixed in the first quarter with spreads on the Bloomberg Barclays Long Credit index finishing the quarter unchanged while spreads on the corresponding intermediate index declined by 9 basis points.

• SSgA 1 -3 Yr. Treasury Index returned +0.30% in the quarter, outperforming the +0.27% return for its Citigroup 1 - 3 Yr. Treasury Index.

• U.S. high yield spreads continued to grind lower by 26 basis points in the early months of 2017 to near cycle lows last seen in 2014. Since peaking at almost 8.5% in February 2016, high yield spreads have now tightened by over 450 basis points cumulatively. An increase in option adjusted spreads on the Bloomberg Barclays U.S. High yield index in March to close the quarter at 3.8% was notable as it was the first increase after 8 consecutive months of decline. Investment grade spreads in contrast, were mixed in the first quarter with spreads on the Bloomberg Barclays Long Credit index finishing the quarter unchanged while spreads on the corresponding intermediate index declined by 9 basis points.

• *Taplin, Canida & Habacht* returned +1.84% in the quarter versus +1.38% for the Investment Grade Credit index. For the fiscal year as of March 31, 2017, Taplin, Canida & Habacht returned +2.16% versus -0.37% for the Investment Grade Credit index. We have substantially reduced the assets with Taplin as part of the restructuring. This performance validates our reason for maintaining a weighting with them.

• Credit was the best performing fixed income sector as spreads tightened with markets pricing in a higher level of future growth. Positive security selection within corporate credit generated outperformance in the period. In particular, names within the technology, chemicals and metals & mining sectors added value, while names within the retail sector detracted from performance.

• Quality selection was a positive contributor for the quarter. The portfolio's overweight to lower quality investment grade added to performance as that segment outperformed overall credit. However, sector selection within credit was a modest negative factor for the quarter. The portfolio maintained an overweight position to corporate versus non-corporate credit which detracted from relative performance as non-corporate credit outperformed.



#### Enhanced Yield Fixed Income & Bank Loans Commentary

As of March 31, 2017, Enhanced Yield Fixed Income & Bank Loans was \$374.5 million (7.3% versus a Policy target of 8.0%) of the NYBERS Total Fund.

#### Enhanced Yield Fixed Income & Bank Loans Managers

• Loomis Sayles returned +3.25% in the quarter versus +2.71% for the Merrill Lynch High Yield Master II Index. For the fiscal year as of March 31, 2017, Loomis Sayles returned +11.81% versus +10.38% for the Merrill Lynch High Yield Master II Index.

• High yield credit was another top performer during the period as positive security selection guided excess return. Within the space, consumer non-cyclical names produced the bulk of excess return. Exposure to the communications and energy sectors also proved accretive.

• Security selection within our convertible holdings positively impacted results during the period as name specific exposure within the technology sector generated outsized return.

• In general, investment grade credit also contributed to results while outperforming duration-matched Treasurys during the first quarter. Within the space, our energy allocation aided returns and a selected banking name was additive.

• *Shenkman* returned +2.08% in the quarter, underperforming the +2.28% return for its Citigroup BB&B index benchmark. For the fiscal year as of March 31, 2017, Shenkman returned +8.06% versus +9.20% for the Citigroup BB&B index.

• High yield weakened briefly in early March amid substantial new issue supply, tumbling oil prices, and fears that the Federal Reserve could be more aggressive in its rate tightening approach, the market proved resilient towards the end of March, leaving the BofA Merrill Lynch U.S. High Yield Index (H0A0) (the "Index") with a +2.71% return for the quarter, its fifth consecutive quarterly gain.

• Triple-C rated credits outperformed the broad market for the fifth straight quarter garnering a return of +5.17%, approximately double the advances of single-B and double-B rated bonds, which gained +2.67% and +2.01%, respectively. Index prices increased by \$1.22 to \$100.82, leaving the month-end yield and spread at +5.88% and +408bps, respectively, both approximately 30bps tighter than at the end of 2016.

Through March 31, 2017



• **Babson** returned +1.06% during the quarter, slightly underperforming the +1.20% return of the Credit Suisse Leveraged Loan Index. For the fiscal year as of March 31, 2017, Babson returned +6.12%, underperforming the +6.69% return of the Credit Suisse Leveraged Loan Index.

• Among the drivers of the quarterly results was the favorable performance in both credit selection and sector allocation from the Retail sector, which was largely offset by unfavorable credit and sector selection in Metals/Mining.

• An overweight in the Energy sector contributed favorably to performance while credit selection in the Automotive space also contributed positively.

• Portfolio statistics for the quarter-ending December 31 reflect the solid performance of the portfolio and the market during the quarter. The average dollar price of the loans in the account rose to 98.70% of par from 97.85% of par at the end of the prior quarter.

#### TIPS, ETI , Cash Commentary

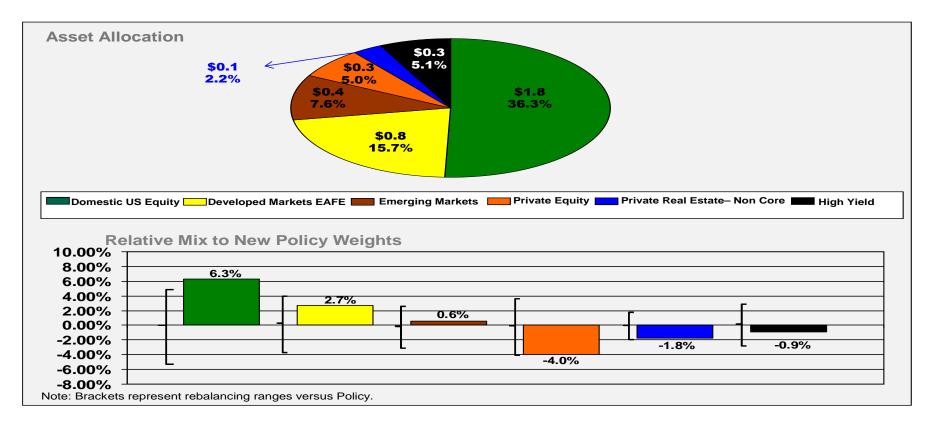
As of March 31, 2017, Fixed Income – TIPS, ETI and Cash was \$336.5 million (6.6%) of the NYBERS Total Fund.

#### Fixed Income – TIPS Managers

• SSgA (TIPS) returned +1.25% in the quarter, in line with the +1.26% return for its Barclays Global Inflation Linked Index. SSgA (TIPS) returned -0.28% for the fiscal year as of March 31, 2017, underperforming the -0.22% return for its Barclays Global Inflation Linked Index.

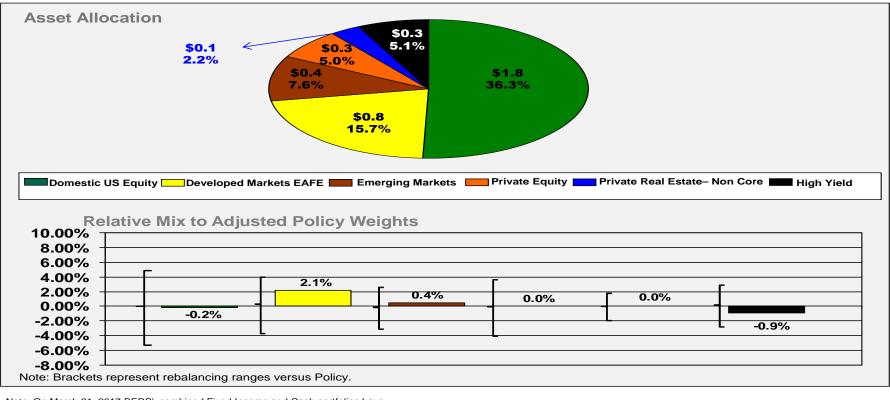


# **Portfolio Asset Allocation – Growth**





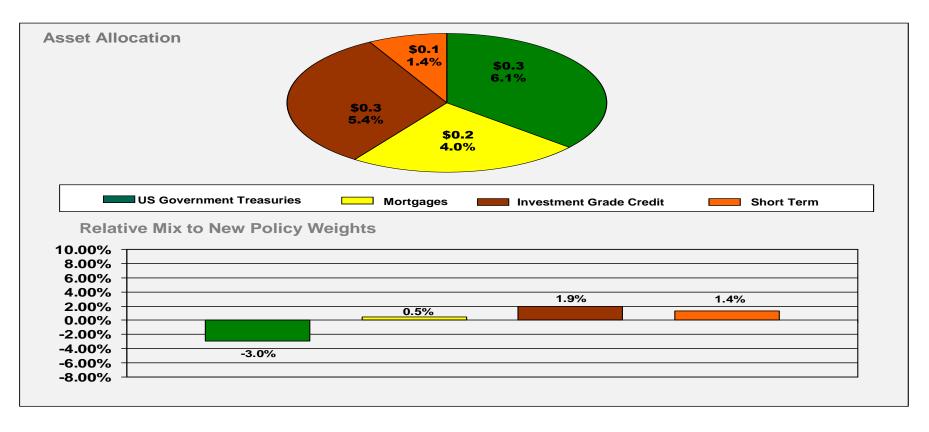
# **Portfolio Asset Allocation – Growth**



Note: On March 31, 2017 BERS' combined Fixed Income and Cash portfolios have a duration of 5.6 years. The duration of the Barclays US Aggregate Index was 6 years on that date.

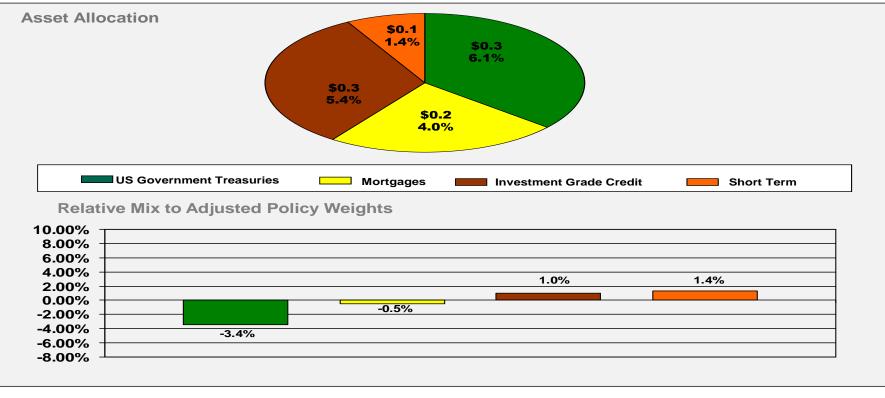


# **Portfolio Asset Allocation – Deflation Protection**





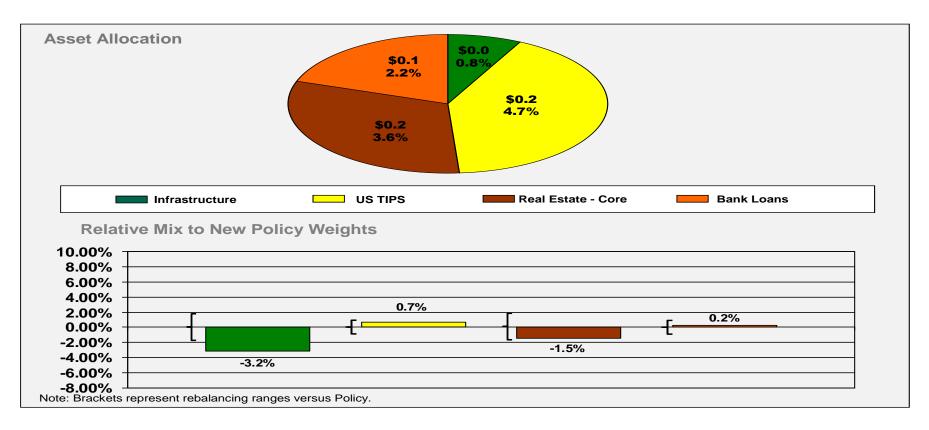
# **Portfolio Asset Allocation – Deflation Protection**



Note: On March 31, 2017 BERS' combined Fixed Income and Cash portfolios have a duration of 5.6 years. The duration of the Barclays US Aggregate Index was 6 years on that date.

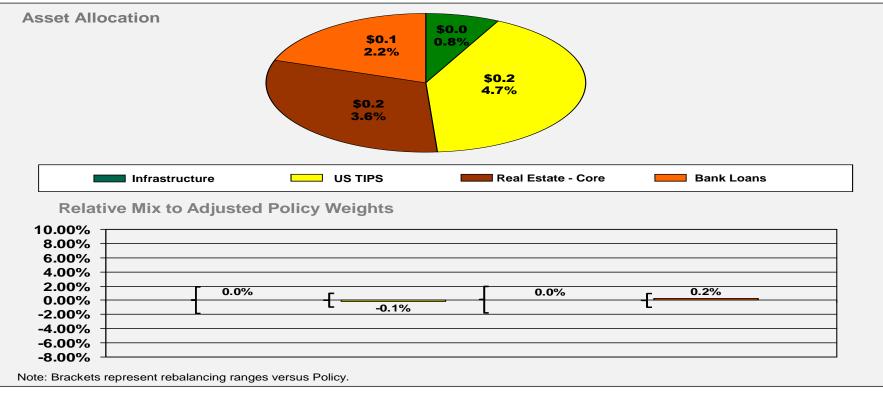


# **Portfolio Asset Allocation – Inflation Protection**





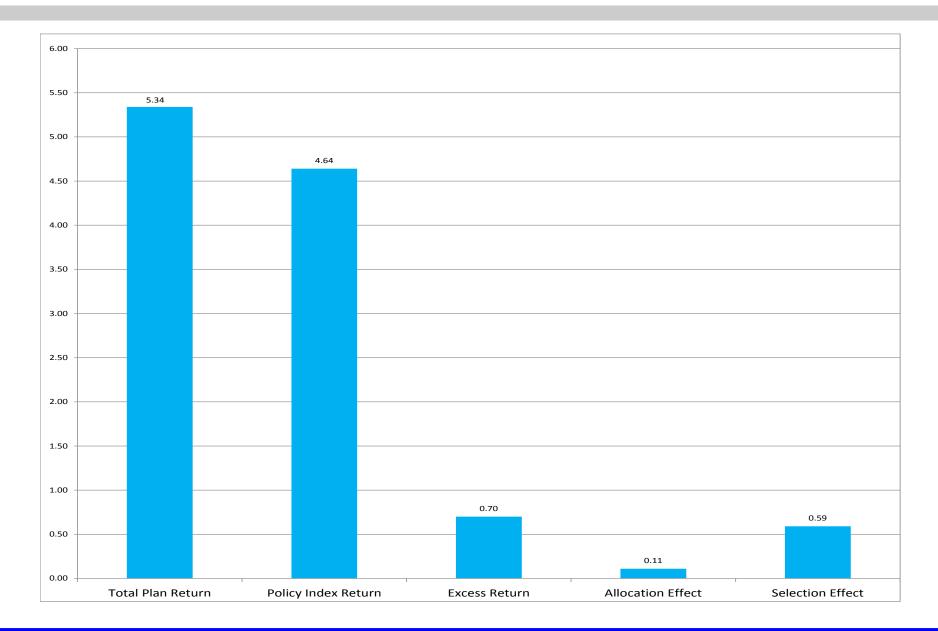
# **Portfolio Asset Allocation – Inflation Protection**



Note: On March 31, 2017 BERS' combined Fixed Income and Cash portfolios have a duration of 5.6 years. The duration of the Barclays US Aggregate Index was 6 years on that date.

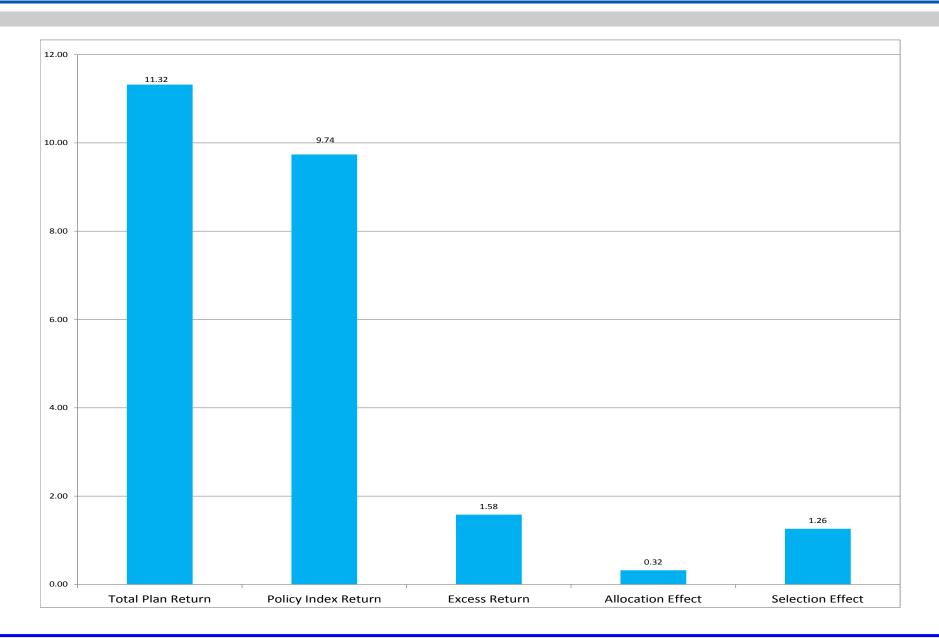
# Performance Attribution: Total Plan - Quarter Ending: March 31, 2017





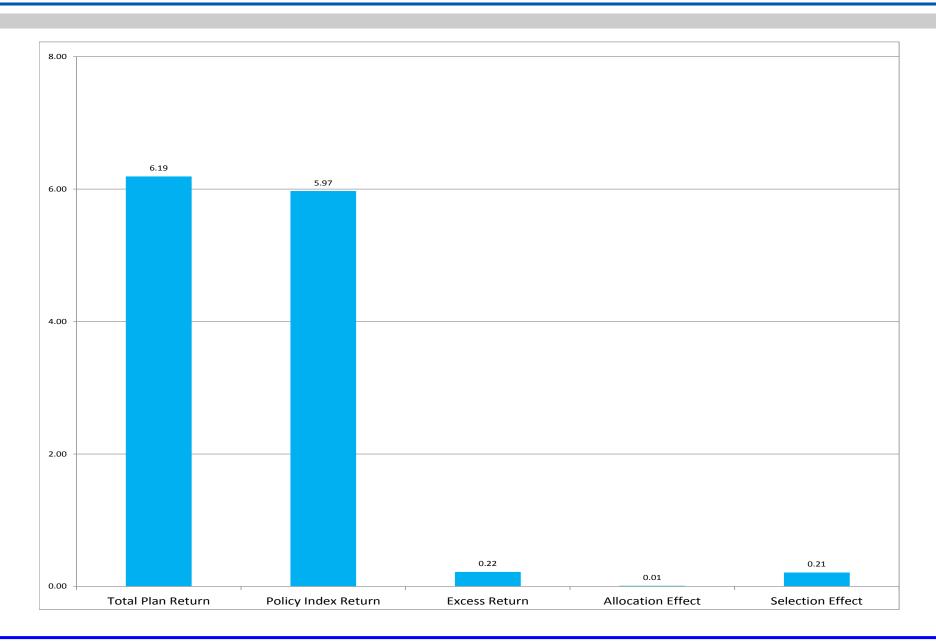
# Performance Attribution: Total Plan - Fiscal Year To Date: March 31, 2017





# Performance Attribution: Total Plan - 3 Years Ending: March 31, 2017



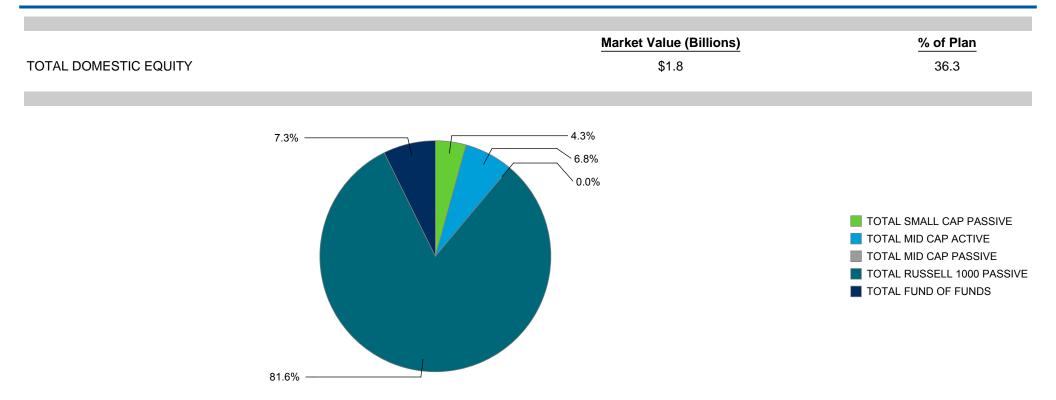




Allocation Effect - Asset Class Breakdown								
	Quarter	<u>FYTD</u>	<u>3 Years</u>	Benchmark				
TOTAL BOARD OF EDUCATION	0.11	0.32	0.01	Board of Education Policy Benchmark				
TOTAL DOMESTIC EQUITY	0.00	0.02	0.02	RUSSELL 3000				
TOTAL DEVELOPED EQUITY	0.05	0.09	0.01	MSCI EAFE IMI Net				
TOTAL EMERGING MARKETS	0.00	-0.01	-0.02	MSCI Emerging Markets				
TOTAL PRIVATE EQUITY	0.00	0.00	0.00	Russell 3K + 300bps				
TOTAL PRIVATE REAL ESTATE - CORE	0.00	-0.01	0.00	NCREIF ODCE net				
TOTAL PRIVATE REAL ESTATE - NON CORE	0.00	0.02	0.00	NCREIF ODCE net + 200bps				
TOTAL INFRASTRUCTURE	0.00	0.00	0.00	CPI + 4%				
TOTAL US TREASURY SHORT TERM	-0.12	-0.14	-0.05	Citigroup USBIG Treasury 1-3 Y Index				
TOTAL US TREASURY INTERMEDIATE LONG	0.26	0.40	0.13	NYC - Treasury Agency Plus Five				
TOTAL INVESTMENT GRADE CREDIT	-0.03	-0.04	-0.01	NYC - Investment Grade Credit				
TOTAL MORTGAGES	0.03	0.04	0.01	CITIGROUP MORTGAGE INDEX				
TOTAL ETI	0.00	0.00	0.00	ETI Custom Benchmark				
TOTAL HIGH YIELD	0.02	0.01	0.01	CITIGROUP BB&B				
TOTAL BANK LOANS	-0.01	-0.01	0.00	Credit Suisse Lev Loan Index				
TOTAL TIPS MANAGERS	0.01	0.02	0.02	Lehman U.S. TIPS				
TOTAL CASH	-0.09	-0.21	-0.11					

Selection Effect - Asset Class Breakdown									
	Quarter_	<u>FYTD</u>	<u>3 Years</u>	Benchmark					
TOTAL BOARD OF EDUCATION	0.59	1.26	0.21	Board of Education Policy Benchmark					
TOTAL DOMESTIC EQUITY	0.00	0.08	-0.21	RUSSELL 3000					
TOTAL DEVELOPED EQUITY	0.44	0.87	0.15	MSCI EAFE IMI Net					
TOTAL EMERGING MARKETS	0.18	0.37	0.16	MSCI Emerging Markets					
TOTAL PRIVATE EQUITY	-0.10	-0.27	0.07	Russell 3K + 300bps					
TOTAL PRIVATE REAL ESTATE - CORE	0.04	-0.02	-0.01	NCREIF ODCE net					
TOTAL PRIVATE REAL ESTATE - NON CORE	0.00	-0.04	-0.01	NCREIF ODCE net + 200bps					
TOTAL INFRASTRUCTURE	0.01	0.01	0.01	CPI + 4%					
TOTAL US TREASURY SHORT TERM	0.00	0.00	0.00	Citigroup USBIG Treasury 1-3 Y Index					
TOTAL US TREASURY INTERMEDIATE LONG	0.00	0.00	0.00	NYC - Treasury Agency Plus Five					
TOTAL INVESTMENT GRADE CREDIT	0.01	0.02	0.01	NYC - Investment Grade Credit					
TOTAL MORTGAGES	0.01	0.01	0.00	CITIGROUP MORTGAGE INDEX					
TOTAL ETI	0.00	0.00	0.00	ETI Custom Benchmark					
TOTAL HIGH YIELD	0.02	0.04	0.00	CITIGROUP BB&B					
TOTAL BANK LOANS	0.00	-0.01	-0.01	Credit Suisse Lev Loan Index					
TOTAL TIPS MANAGERS	0.00	0.00	0.00	Lehman U.S. TIPS					
TOTAL CASH	0.00	0.00	0.01						

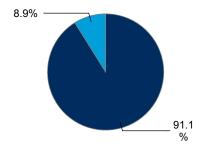




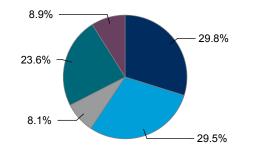
Sub Sector	Policy	Actual	Under/Over	Index	Actual	
	Weight	Weight	Weight	Return	Return	Difference
TOTAL SMALL CAP ACTIVE	2.83	0.00	-2.83	2.47		-2.47
TOTAL SMALL CAP PASSIVE	5.39	4.27	-1.12	2.47	2.49	0.03
TOTAL MID CAP ACTIVE	7.25	6.80	-0.45	5.15	6.20	1.05
TOTAL MID CAP PASSIVE	3.75	0.00	-3.75	3.94		-3.94
OTAL RUSSELL 1000 ACTIVE	11.25	0.00	-11.25	6.03		-6.03
OTAL RUSSELL 1000 PASSIVE	62.03	81.63	19.60	6.03	6.00	-0.03
TOTAL EMERGING MANAGERS	7.50	7.30	-0.20	4.10	4.51	0.41

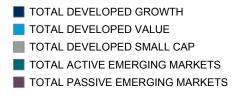


	Market Value (Billions)	<u>% of Plan</u>
TOTAL INTERNATIONAL EQUITY	\$1.2	23.3



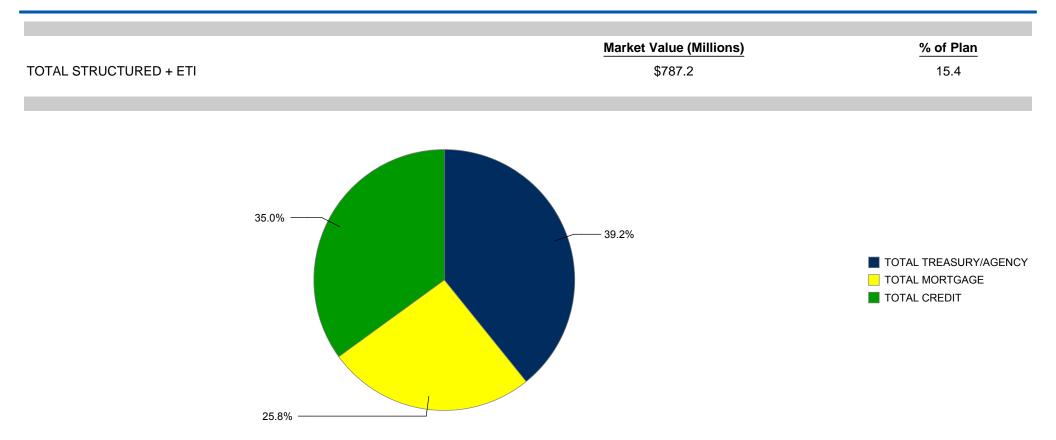
TOTAL ACTIVE INTERNATIONAL EQUITY
 TOTAL PASSIVE INTERNATIONAL EQUITY





	Asset Weight	Fund	Benchmark	Excess
TOTAL DEVELOPED GROWTH	29.78	12.29	8.52	3.77
TOTAL DEVELOPED VALUE	29.54	8.15	6.05	2.10
TOTAL DEVELOPED SMALL CAP	8.14	10.12	8.04	2.08
TOTAL ACTIVE EMERGING MARKETS	23.65	15.03	11.44	3.59
TOTAL PASSIVE EMERGING MARKETS	8.89	11.67	11.44	0.23
TOTAL INTERNATIONAL EQUITY	100.00	11.33	7.86	3.47



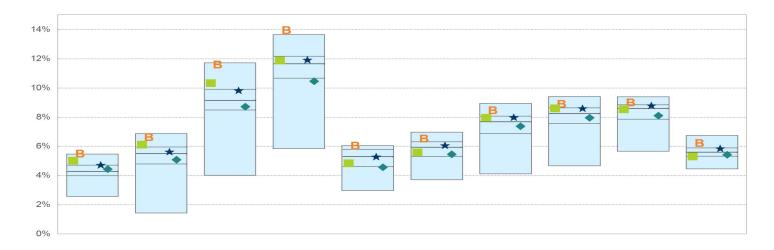


Sub Sector	Policy Weight	Actual Weight	Under/Over Weight	Index Return	Actual Return	Difference
TOTAL TREASURY/AGENCY	21.12	39.17	18.05	1.09	0.78	-0.32
TOTAL MORTGAGE	34.45	25.80	-8.65	0.43	0.70	0.27
TOTAL INV GRADE CREDIT	44.43	35.03	-9.40	1.38	1.57	0.19



# W Wilshire



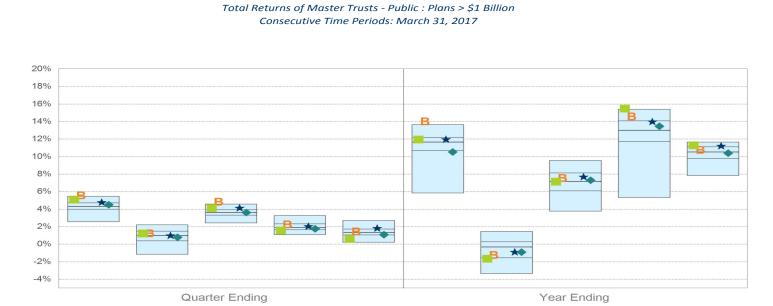


Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	5.47	6.88	11.72	13.66	6.06	6.98	8.95	9.41	9.40	6.75
25th	4.71	5.95	9.92	12.17	5.79	6.32	8.07	8.64	8.85	5.90
50th	4.28	5.50	9.16	11.65	5.30	5.94	7.68	8.25	8.61	5.61
75th	3.99	4.79	8.50	10.68	4.62	5.31	6.88	7.58	7.87	5.33
95th	2.56	1.44	4.02	5.84	2.97	3.72	4.11	4.67	5.66	4.45
No. Of Obs	66	66	66	66	65	65	65	64	61	58
Total System - BOE	5.41 (7)	6.54 (8)	11.52 (7)	13.87 (2)	5.96 (13)	6.44 (17)	8.38 (14)	8.82 (15)	8.92 (20)	6.13 (16
Board of Ed Policy Ben	4.64 (31)	5.54 (48)	9.74 (29)	11.83 (39)	5.20 (50)	5.97 (48)	7.89 (31)	8.51 (37)	8.70 (40)	5.77 (41
Public Mkt Equiv 25	4.92 (14)	6.03 (19)	10.24 (16)	11.78 (40)	4.75 (68)	5.49 (67)	7.87 (32)	8.51 (37)	8.44 (53)	5.22 (80
Public Mkt Equiv 35	4.34 (45)	4.99 (65)	8.62 (68)	10.36 (76)	4.48 (78)	5.36 (70)	7.29 (64)	7.87 (67)	8.01 (68)	5.33 (75

Wilshire Trust Universe Comparison Service® (TUCS®)



### W Wilshire



City of New York Performance Comparison

Percentile Rankings Mar 13 Mar 17 Sep 16 Mar 16 Mar 17 Mar 16 Mar 15 Mar 14 Dec 16 Jun 16 5th 5.47 2.20 4.59 3.25 2.70 13.66 1.45 9.56 15.41 11.65 25th 1.49 0.28 14.08 4 71 3.93 2.31 1.73 12.17 8.14 11.13 50th 0.98 3.61 12.99 4.28 1.88 1.34 11.65 -0.31 7.16 10.54 75th 3.99 0.38 3.31 1.65 1.05 10.68 -1.55 6.09 11.75 9.80 95th 2.56 -1.15 2.44 1.07 0.22 5.84 -3.35 3.76 5.33 7.84 No. Of Obs 64 66 66 66 65 66 65 65 66 65 B Total System - BOE 5.41 (7) 1.08 (40) 4.68 (4) 2.11 (31) 1.30 (54) 13.87 (2) -1.39 (70) 7.40 (43) 14.42 (20) 10.60 (48) ★ Board of Ed Policy Ben 4.64 (31) 0.85 (56) 3.98 (20) 1.90 (48) 1.68 (31) 11.83 (39) -1.04 (60) 7.54 (39) 13.84 (31) 11.06 (29) Public Mkt Equiv 25 4.92 (14) 1.05 (45) 3.98 (22) 1.40 (91) 0.44 (92) 11.78 (40) -1.83 (81) 6.98 (57) 15.32 (7) 11.11 (26) Public Mkt Equiv 35 4.34 (45) 0.62 (67) 3.46 (67) 1.60 (78) 0.91 (86) 10.36 (76) -1.08 (60) 7.14 (53) 13.29 (39) 10.23 (60)

Wilshire Trust Universe Comparison Service® (TUCS®)

Through March 31, 2017



	ESTIMATED FEES FOR FY 2017 UPDATED THROUGH NOVEMBER 2016 Actual									
	Act 20		Estimates 2017							
INVESTMENT STYLE (EQUITIES)	Avg MV 16 (\$MM)	Mgmt Fees BPS	MV 11-30-16 (\$MM)	Mgmt Fees BPS						
US Equities	1,692	9.79	1,812	8.39						
Small Cap Active	0	-	-	-						
Small Cap Growth	-	-	-	-						
Small Cap Value	-	-	-	-						
Small Cap core	0	-	-							
Small Cap Fundamental Index	-	-	-	-						
Small/Mid Cap Active	-	_	_	-						
Small/Mid Cap Growth	_	-	_	-						
Small/Mid Cap Value	-	-	-	-						
	100	45 70	450							
Mid Cap Active	138	45.78	153	30.00						
Mid Cap Growth	-	-	-	-						
Mid Cap Value	138	45.78	- 153	30.00						
Mid Cap core	138	45.78	153	30.00						
Russell 1000 Active	-	-								
Russell 1000 Fundamental Index	-	-	-	-						
Active Emerging Managers (U.S. Equities)	171	56.38	167	60.00						
Total US Active Equities	309	51.80	319	45.65						
Total US Passive Equities	1,384	0.42	1,492	0.42						
Environmental US E. Strategies	-	-	-	-						
International Equities	916	27.39	1,001	27.81						
Active EAFE Equities	709	24.73	758	25.08						
Growth	320	25.68	326	27.04						
Value	308	21.55	326	21.14						
Small Cap	81	33.05	86	33.51						
Non-US Environmental Strategies	-	-	-	-						
Active Emerging Markets	207	36.51	242	36.38						
Total Int'l Active Equities	916	27.39	1,001	27.8						
Total Int'l Passive Equities	-	-	-	-						
Total Passive Developed Markets	-	-	-	-						
Total Passive Emerging Markets	-	-	-	-						
REITS Passive Index			_							

Information provided by the New York City Comptroller



## BERS RETIREMENT SYSTEM ACTUAL FEES FOR FISCAL YEAR ENDED JUNE 30, 2016 AND ESTIMATED FEES FOR FY 2017 UPDATED THROUGH NOVEMBER 2016

	Ac 20	tual 16	Estim 201	
INVESTMENT STYLE (FIXED INCOME)	Avg MV 16 (\$MM)	Mgmt Fees BPS	MV 11-30-16 (\$MM)	Mgmt Fees BPS
Fixed Income	1,300	11.98	1,373	11.74
Structured Program	658	6.19	640	6.42
Government Sector		4.41	127	3.46
SSGA Long Duration Treasury Mortgage Sector		4.29	- 203	- 4.97
Investment Grade Credit Sector		8.42	310	8.59
	200	0.42	310	0.00
Global Fixed Income	-	-	-	-
Progress Fixed Emerging Managers	-	-	-	-
TIPS	172	0.52	216	0.51
Active TIPS	-	-		-
Passive TIPS	172	0.52	216	0.51
Enhanced Yield	220	33.39	250	29.13
Bank Loans	96	33.92	111	34.39
Convertible Bonds	-	-	-	-
ETI - Access - RBC	7	24.98	11	17.78
ETI - AFL-CIO HIT	15	42.48	16	39.53
Total Public Markets (Externally managed)	3,776	15.15	4,054	14.59
Other ETI Programs	6	-	7	-
In-House Short Term	125	0.00	123	0.00
Total Public Markets	3,908	14.64	4,185	14.13
INVESTMENT STYLE (PRIVATE)				
Hedge Funds	-	-	-	-
Private Equities	212	184.15	240	<b>216.03</b> 1
Private Real Estate	219	116.86	248	101.72
Infrastructure	28	76.29	39	<b>101.45</b> 2
Opportunistic Fixed Income	-	-	-	
Total Private Markets	459	<b>154.30</b> 3	527	161.83
Total Overall	4,367	29.32	4,712	30.65

Footnotes 1 -Private Equity estimates for FY 2017 are based on partnership terms. For funds in the investment period, management fees are based on the committed capital. For funds in the post-investment period, management fees are based on the Market Value as of 6/30/2016. 2 - Infrastructure Fees are based on committed amounts for each investment which are higher than the market values.

3 - Private Markets Investments exclude GP CARRY & Incentive Fees 4 -The Incentive Fees paid for the BERS Fund in 2016 are 2.24 BPS.

Information provided by the New York City Comptroller



#### NYC BOARD OF EDUCATION RETIREMENT SYSTEM SECURITIES LENDING INCOME March 31, 2017

	U. S. FIXED INCOME	U. S. EQUITY	INTERNATIONAL EQUITY	TOTAL
1989	70,000	-	-	70,000
1990	79,000	-	-	79,000
1991	111,000	-	-	111,000
1992	122,000	11,000	-	133,000
1993	79,000	32,000	15,000	126,000
1994	93,000	77,000	20,000	190,000
1995	112,000	93,000	12,000	217,000
1996	99,000	76,000	27,000	202,000
1997	101,000	126,000	40,000	267,000
1998	111,000	170,000	60,000	341,000
1999	159,000	263,000	100,000	522,000
2000	193,000	310,000	97,000	600,000
2001	295,000	208,000	159,000	662,000
2002	209,000	143,000	152,000	504,000
2003	153,000	158,000	195,000	506,000
2004	226,000	255,000	174,000	655,000
2005	384,000	479,000	217,000	1,080,000
2006	303,000	734,000	246,000	1,283,000
2007	593,000	1,208,000	272,000	2,073,000
2008	2,514,000	2,266,000	451,000	5,231,000
2009	698,000	1,416,000	367,000	2,481,000
2010	246,000	729,000	326,000	1,301,000
2011	340,000	943,000	599,000	1,882,000
2012	516,000	1,144,000	495,000	2,155,000
2013	349,000	1,325,000	446,000	2,120,000
2014	287,000	512,000	1,387,000	2,186,000
2015	338,000	429,000	1,985,000	2,752,000
2016	418,000	1,585,000	1,685,000	3,688,000
2017(3 months)	175,000	271,000	260,000	706,000
Since Inception	9,373,000	14,963,000	9,787,000	34,123,000



New York City Board of Education Retirement System

# **Appendix A**

## **Consolidated Performance Report**



		t Value														
	(\$N SYSTEM RETURN SUMMARY	1M)	% of Total	3 Month	FYTD	CYTD	2016	2015	2014	2013	2012	3 Year	5 Year	10 Year	ITD	Inception Date
	STSTEIN RETORN SOMMART															
5	BERS-TOTAL PORTFOLIO - GROSS	5,097	100.00	5.41	11.52	5.41	9.44	(0.20)	6.64	18.78	13.50	6.44	8.82	6.13	8.76	07/01/1987
	BERS - ESTIMATED INVESTMENT FEES			(0.06)	(0.20)	(0.06)	(0.25)	(0.24)	(0.24)			(0.25)				
	EST MANAGEMENT FEES - PUBLIC MARKET (ACCRUAL)			(0.03)	(0.09)	(0.03)	(0.13)	(0.14)	(0.15)							
	EST MANAGEMENT FEES - ALTERNATIVE MARKETS (CASH EST INCENTIVE FEES EST OTHER FEES EST FEE OFFSETS	1)		(0.03)	(0.11)	(0.03)	(0.12)	(0.10)	(0.10)							
	BERS-TOTAL PORTFOLIO - NET MGR		-	5.34	11.32	5.34	9.19	(0.44)	6.39			6.19				
	BOARD OF EDUCATION POLICY BENCHMARK			4.64	9.74	4.64	8.66	(0.08)	6.93	18.10	14.05	5.97	8.51	5.77		
	EXCESS RETURN		=	0.70	1.58	0.70	0.53	(0.36)	(0.53)	0.68	(0.55)	0.22	0.31	0.37		
	EQUITY RETURN DETAIL															
18	BERS-TOTAL EQUITY (INCLUDES PE & RA) - GROSS	3,628	71.18	7.02	15.76	7.02	10.72	(0.13)	7.08	27.83	16.72	7.65	11.06	6.32	9.07	08/01/1993
	ESTIMATED INVESTMENT FEES			(0.07)	(0.25)	(0.07)	(0.30)	(0.30)	(0.28)			(0.30)				
	EST MANAGEMENT FEES EST INCENTIVE FEES EST OTHER FEES EST FEE OFFSETS			(0.07)	(0.25)	(0.07)	(0.30)	(0.30)	(0.28)							
	BERS-TOTAL EQUITY (INCL PE & RA) - NET MGR			6.95	15.51	6.95	10.42	(0.43)	6.81			7.35				
26	BERS-TOTAL DOMESTIC EQUITY - GROSS	1,850	36.29	5.75	15.35	5.75	12.69	0.51	11.27	35.96	16.62	9.35	13.24	7.54	9.73	09/01/1991
	ESTIMATED INVESTMENT FEES		_	(0.02)	(0.08)	(0.02)	(0.12)	(0.12)	(0.13)			(0.12)				
	BERS-TOTAL DOMESTIC EQUITY - NET MGR			5.73	15.27	5.73	12.57	0.39	11.14			9.23				
	RUSSELL 3000 (DAILY)		-	5.74	15.04	5.74	12.74	0.48	12.56	33.55	16.42	9.76	13.18	7.54	9.62	
	EXCESS RETURN			(0.01)	0.23	(0.01)	(0.17)	(0.09)	(1.42)	2.41	0.20	(0.52)	0.06	(0.00)	0.11	
36	BERS-TOTAL SMALL CAP - GROSS	79	1.55	2.49	21.64	2.49	21.28	(6.44)	3.20	44.74	19.91	5.87	13.05	5.80	6.88	04/01/2004
	ESTIMATED INVESTMENT FEES			(0.00)	(0.00)	(0.00)	(0.01)	(0.08)	(0.15)			(0.07)				
	BERS-TOTAL SMALL CAP - NET MGR		-	2.49	21.64	2.49	21.28	(6.52)	3.05			5.80				
	RUSSELL 2000 (DAILY)			2.47	21.60	2.47	21.31	(4.41)	4.89	38.82	16.35	7.22	12.35	7.12	8.23	
	EXCESS RETURN			0.03	0.03	0.03	(0.03)	(2.11)	(1.85)	5.92	3.56	(1.42)	0.69	(1.33)	(1.34)	
46	BERS-TOTAL MID CAP - GROSS	126	2.47	6.20	16.28	6.20	12.90	2.56	10.77	37.52	19.12	9.57	14.14		14.28	10/01/2010
	ESTIMATED INVESTMENT FEES		-	(0.02)	(0.32)	(0.02)	(0.62)	(0.55)	(0.41)			(0.50)				
	BERS-TOTAL MID CAP - NET MGR			6.19	15.96	6.19	12.28	2.01	10.36			9.07				
	RUSSELL MIDCAP (DAILY)		-	5.15	13.42	5.15	13.80	(2.44)	13.22	34.76	17.28	8.48	13.09		13.87	
	EXCESS RETURN			1.04	2.54	1.04	(1.51)	4.45	(2.86)	2.76	1.84	0.59	1.06		0.41	



		Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2016	2015	2014	2013	2012	3 Year	5 Year	10 Year	ITD	Inception Date
	EQUITY RETURN DETAIL															
58	BERS-TOTAL RUSSELL 1000 - GROSS ESTIMATED INVESTMENT FEES	1,510	29.62	6.00 (0.00)	14.57 (0.00)	6.00 (0.00)	12.20 (0.00)	0.98 (0.00)	12.92 (0.01)	62.18	14.87	10.00 (0.01)	17.15	9.98	10.17	09/01/1993
	BERS-TOTAL RUSSELL 1000 - NET MGR RUSSELL 1000 (DAILY)		_	6.00 6.03	14.56 14.52	6.00 6.03	12.20 12.05	0.97 0.92	12.91 13.24	33.11	16.42	10.00 9.99	13.26	7.58	9.38	
	EXCESS RETURN			(0.03)	0.04	(0.03)	0.14	0.05	(0.33)	29.07	(1.56)	0.01	3.89	2.40	0.79	
68	BERS-TOTAL FUND OF FUNDS - GROSS ESTIMATED INVESTMENT FEES	135	2.65	4.51 (0.22)	18.50 (0.61)	4.51 (0.22)	13.00 (0.73)	(3.07) (0.65)	5.43 (0.71)	40.84	17.00	6.11 (0.72)	11.68	7.24	8.05	04/01/2004
	BERS-TOTAL FUND OF FUNDS - NET MGR BLENDED RUSSELL 2000 & 3000		_	4.29 4.10	17.89 18.36	4.29 4.10	12.27 17.04	(3.72) (1.93)	4.72 8.78	36.20	16.41	5.40 8.58	12.84	7.40	8.33	
	EXCESS RETURN		_	0.19	(0.47)	0.19	(4.77)	(1.79)	(4.06)	4.64	0.58	(3.18)	(1.16)	(0.17)	(0.29)	



		Market Value (\$MM)	% of Total	3 Month	FYTD	СҮТД	2016	2015	2014	2013	2012	3 Year	5 Year	10 Year	ITD	Inception Date
	EQUITY RETURN DETAIL															
80	BERS-TOTAL INTERNATIONAL EQUITY - GROSS ESTIMATED INVESTMENT FEES	1,187	23.29	11.33 (0.07)	20.26 (0.23)	11.33 (0.07)	7.65 (0.29)	(7.04) (0.25)	(3.03) (0.26)	17.99	18.36	2.29 (0.28)	6.13	3.69	7.62	11/01/1992
	BERS-TOTAL INTERNATIONAL EQUITY - NET MGR MSCI AC WORLD EX US (NET)		-	11.26 7.86	20.03 13.87	11.26 7.86	7.36 4.50	(7.30) (5.66)	(3.30) (3.87)	15.29	16.83	2.01 0.56	4.36	1.35		
	EXCESS RETURN		-	3.40	6.16	3.40	2.86	(1.63)	0.57	2.70	1.52	1.45	1.77	2.34		
90	BERS-TOTAL DEVELOPED GROWTH ACTIVE - GROSS ESTIMATED INVESTMENT FEES	354	6.94	12.29 (0.07)	18.29 (0.22)	12.29 (0.07)	0.96 (0.26)	(3.56) (0.25)	(6.42) (0.24)	29.53	18.88	1.09 (0.26)	6.94		4.16	08/01/2007
	BERS-TOTAL DEVELOPED GROWTH ACTIVE - NET MGR		-	12.22	18.07	12.22	0.70	(3.81)	(6.66)			0.82				
	MSCI EAFE GROWTH		_	8.52	7.60	8.52	(3.04)	4.09	(4.43)	22.55	16.86	1.50	6.00		1.45	
	EXCESS RETURN			3.70	10.46	3.70	3.74	(7.90)	(2.23)	6.98	2.02	(0.67)	0.94		2.71	
100	BERS-TOTAL DEVELOPED VALUE ACTIVE - GROSS ESTIMATED INVESTMENT FEES	351	6.88	8.15 (0.06)	20.36 (0.19)	8.15 (0.06)	11.38 (0.24)	(9.37) (0.19)	(2.98) (0.21)	16.94	17.84	1.24 (0.21)	5.68	2.31	6.66	08/01/2004
	BERS-TOTAL DEVELOPED VALUE ACTIVE - NET MGR MSCI EAFE VALUE NET (DAILY)		=	8.09 6.05	20.17 19.31	8.09 6.05	11.14 5.02	(9.56) (5.68)	(3.19) (5.39)	22.95	17.69	1.02 (0.61)	5.56	0.05	4.93	
	EXCESS RETURN			2.05	0.87	2.05	6.12	(3.87)	2.21	(6.01)	0.15	1.63	0.12	2.26	1.73	
110	BERS-TOTAL DEVELOPED SMALL CAP ACTIVE - GROSS ESTIMATED INVESTMENT FEES	97	1.90	10.12 (0.09)	17.26 (0.29)	10.12 (0.09)	6.76 (0.35)	9.04 (0.36)	(4.60) (0.32)			5.27 (0.35)			9.35	05/01/2013
	BERS-TOTAL DEVELOPED SMALL CAP ACTIVE - NET MGR	R	_	10.03	16.98	10.03	6.41	8.68	(4.92)			4.93				
	S&P EPAC SMALL CAP USD NET EXCESS RETURN		-	8.04 1.99	13.18 3.80	8.04 1.99	1.34 5.07	8.58 0.09	(3.43) (1.49)			3.44 1.49			7.31 2.04	
				1.00	0.00		0.07	0.00	(1.43)			1.43			2.04	
120	BERS-TOTAL ACTIVE EMERGING MARKETS - GROSS ESTIMATED INVESTMENT FEES	281	5.51	15.03 (0.10)	24.47 (0.33)	15.03 (0.10)	13.14 (0.40)	(14.83) (0.31)	4.14 (0.37)	(4.70)	18.12	4.55 (0.37)	2.85	3.00	8.79	04/01/2004
	BERS-TOTAL ACTIVE EMERGING MARKETS - NET MGR MSCI EMERGING MARKETS			14.93 11.44	24.15 16.44	14.93 11.44	12.74 11.19	(15.14) (14.92)	3.77 (2.19)	(2.60)	18.22	4.18 1.18	0.81	2.72	7.98	
	EXCESS RETURN		-	3.49	7.70	3.49	1.55	(14.92)	5.96	(2.00) (2.10)	(0.11)	3.01	2.04	0.28	0.81	



		Market Value (\$MM)	% of Total	3 Month	FYTD	СҮТД	2016	2015	2014	2013	2012	3 Year	5 Year	10 Year	ITD	Inception Date
	EQUITY RETURN DETAIL															
132	BERS-TOTAL PRIVATE EQUITY (TIME WEIGHTED) NYC R3000 +3% LAGGED EXCESS RETURN	255	5.01	3.11 4.97 (1.86)	9.69 14.13 (4.43)	3.11 4.97 (1.86)	10.42 18.37 (7.96)	14.26 2.49 11.77	22.16 21.24 0.92	15.34 24.53 (9.19)	7.70 35.20 (27.50)	16.55 11.67 4.89	14.78 18.07 (3.29)	8.52 11.42 (2.90)	5.65 <u>11.86</u> (6.22)	07/01/2006
142	BERS-TOTAL PRIVATE REAL ESTATE (TIME WEIGHTED) NCREIF NFI-ODCE NET + 100 BP EXCESS RETURN	293	5.75	2.38 1.80 0.59	7.09 <u>6.13</u> 0.95	2.38 1.80 0.59	10.75 <u>8.86</u> 1.89	16.06 15.08 0.98	13.67 <u>12.56</u> 1.10	8.64 14.02 (5.39)	14.30 10.88 3.41	13.16 11.87 1.29	12.52 12.04 0.48		11.85 <u>13.32</u> (1.47)	12/01/2010
152	BERS-TOTAL INFRASTRUCTURE (TIME WEIGHTED) CPI + 4% EXCESS RETURN	43	0.84	2.75 1.37 1.37	7.51 4.66 2.84	2.75 1.37 1.37	9.26 6.18 3.08	11.63 4.68 6.94	18.85 4.69 14.16			18.22 5.13 13.09			12.70 5.27 7.43	12/01/2013



		Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2016	2015	2014	2013	2012	3 Year	5 Year	10 Year	ITD	Inception Date
	FIXED INCOME RETURN DETAIL															
164	BERS-TOTAL FIXED INCOME - GROSS ESTIMATED INVESTMENT FEES	1,400	27.46	1.43 (0.03)	1.77 (0.10)	1.43 (0.03)	6.65 (0.13)	(0.68) (0.13)	5.69 (0.16)	(0.56)	8.55	3.47 (0.14)	3.75	5.62	5.35	04/01/2004
	EST MANAGEMENT FEES EST INCENTIVE FEES EST OTHER FEES EST FEE OFFSETS			(0.03)	(0.10)	(0.03)	(0.13)	(0.13)	(0.16)							
	BERS-TOTAL FIXED INCOME - NET MGR		_	1.40	1.67	1.40	6.51	(0.81)	5.53			3.33				
172	BERS-TOTAL STRUCTURED FIXED INCOME - GROSS	758	14.86	1.07	(1.04)	1.07	3.95	0.26	7.66	(2.38)	6.68	3.42	3.19	5.14	7.72	01/01/1985
	ESTIMATED INVESTMENT FEES		-	(0.01)	(0.04)	(0.01)	(0.06)	(0.06)	(0.08)			(0.06)				
	BERS-TOTAL STRUCTURED FIXED INCOME - NET MGR			1.06	(1.08)	1.06	3.89	0.20	7.58			3.36				
	NYC - CORE PLUS FIVE		-	0.99	(1.99)	0.99	3.20	0.41	7.66	(2.79)	5.41	3.23	2.84	4.92		
	EXCESS RETURN			0.07	0.91	0.07	0.70	(0.21)	(0.08)	0.41	1.27	0.13	0.35	0.22		
182	BERS-TOTAL TIPS - GROSS	238	4.67	1.25	(0.28)	1.25	4.78	(0.83)	3.37	(8.52)	7.67	2.13	1.22	4.45	4.05	06/01/2005
	ESTIMATED INVESTMENT FEES		_	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.10)			(0.04)				
	BERS-TOTAL TIPS - NET MGR			1.25	(0.28)	1.25	4.78	(0.85)	3.27			2.10				
	BBG BARC GBL INF-LK: US TIPS (DLY)		-	1.26	(0.22)	1.26	4.68	(1.44)	3.64	(8.61)	6.98	2.03	0.97	4.24	3.87	
	EXCESS RETURN			(0.01)	(0.06)	(0.01)	0.09	0.58	(0.37)	0.09	0.69	0.07	0.24	0.21	0.18	
192	BERS-TOTAL HIGH YIELD - GROSS	261	5.13	2.75	10.16	2.75	15.96	(4.34)	3.09	8.39	15.68	4.36	6.85	7.48	6.09	08/01/1997
	ESTIMATED INVESTMENT FEES		-	(0.09)	(0.26)	(0.09)	(0.36)	(0.32)	(0.34)			(0.34)				
	BERS-TOTAL HIGH YIELD - NET MGR			2.66	9.90	2.66	15.60	(4.66)	2.75	0.47		4.02	0.04	0.00	0.40	
	CITIGROUP BB & B EXCESS RETURN		-	2.28 0.38	9.20 0.70	2.28 0.38	15.48 0.12	(4.21) (0.45)	2.78 (0.04)	6.17 <b>2.22</b>	14.45 <b>1.23</b>	4.14 (0.12)	6.21 <b>0.64</b>	6.02 1.45	6.10 (0.01)	
		110	0.00		0.00			0.40	0.04	0.00		0.77			4.50	10/01/0010
202	BERS- TOTAL BANK LOANS - GROSS ESTIMATED INVESTMENT FEES	113	2.22	1.15 (0.09)	6.39 (0.28)	1.15 (0.09)	8.86 (0.38)	0.46 (0.34)	2.34 (0.35)	6.33		3.77 (0.36)			4.56	12/01/2012
	BERS-TOTAL BANK LOANS - NET MGR		-	1.06	6.12	1.06	8.48	0.12	1.99			3.41				
	CSFB LEVERAGED LOAN INDEX			1.20	6.69	1.20	9.88	(0.38)	2.06	6.15		3.72			4.48	
	EXCESS RETURN		-	(0.14)	(0.57)	(0.14)	(1.39)	0.51	(0.07)	0.18		(0.31)			0.08	
212	BERS-TOTAL TARGETED INVESTMENTS (NO CASH)	30	0.58	0.74	(2.15)	0.74	2.60	3.60	7.31	(1.66)	4.35	4.09	3.27	4.78	6.90	12/01/1984
	BERS CUSTOM BENCHMARK (NO CASH)			0.71	(1.18)	0.71	2.43	1.18	5.76	(1.71)	3.74	2.78	2.33	4.14		
	EXCESS RETURN		-	0.03	(0.96)	0.03	0.17	2.42	1.55	0.05	0.60	1.30	0.94	0.64		



		Market Value (\$MM)	% of Total	3 Month	FYTD	СҮТД	2016	2015	2014	2013	2012	3 Year	5 Year	10 Year	ITD	Inception Date
	CASH SUMMARY															
224	BOARD OF ED. SHORT TERM - GROSS ESTIMATED INVESTMENT FEES BOARD OF ED. SHORT TERM - NET MGR	66	1.29	0.23 0.00 0.23	0.45 0.00 0.45	0.23 0.00 0.23	0.55 0.00 0.55	0.39 0.00 0.39	0.28 0.00 0.28	0.29 0.00 0.29	0.53 0.00 0.53	0.47 0.00 0.47	0.44 0.00 0.44	1.31 0.00 1.31	2.05	
228	C/D - FAIL FLOAT EARNINGS	0	0.00													
230	SECURITY LENDING	3	0.06													



New York City Board of Education Retirement System

# **Appendix B**

## Public Markets Manager Performance Detail



	Market Value (\$MM)	% of Total	3 Month	FYTD	СҮТД	2016	2015	2014
EQUITY SUMMARY								
US EQUITY								
NYC BERS BLACKROCK R2000 GROWTH	38	0.75	5.40	19.18	5.40	11.29	(1.30)	5.50
RUSSELL 2000 GROWTH DAILY			5.35	19.17	5.35	11.32	(1.38)	5.60
Excess			0.05	0.01	0.05	(0.02)	0.08	(0.11)
NYC BERS BLACKROCK R2000 VALUE	41	0.80	(0.06)	24.03	(0.06)	31.71	(7.38)	4.11
RUSSELL 2000 VALUE DAILY			(0.13)	24.03	(0.13)	31.74	(7.47)	4.22
Excess			0.07	0.01	0.07	(0.03)	0.09	(0.11)
Wellington Mgmt MCC	126	2.47	6.18	15.96	6.18	12.28	1.76	10.96
S&P MID CAP 400			3.94	16.28	3.94	20.74	(2.18)	9.77
Excess			2.24	(0.32)	2.24	(8.45)	3.94	1.19
NYC BERS BLACKROCK R1000 GROWTH	753	14.78	8.90	15.02	8.90	7.06	5.78	12.91
RUSSELL 1000 GROWTH - DAILY			8.91	15.05	8.91	7.08	5.67	13.05
Excess			(0.01)	(0.03)	(0.01)	(0.02)	0.12	(0.14)
NYC BERS BLACKROCK R1000 VALUE	757	14.85	3.26	13.98	3.26	17.31	(3.81)	13.39
RUSSELL 1000 VALUE (DAILY)		1.00	3.27	14.00	3.27	17.34	(3.83)	13.45
Excess			(0.01)	(0.02)	(0.01)	(0.03)	0.01	(0.06)
						(		(****
FUND OF FUNDS								
BERS-TOTAL FUND OF FUNDS	135	2.65	4.29	17.89	4.29	12.27	(3.72)	4.72
Blended Russell 2000 & 3000			4.10	18.36	4.10	17.04	(1.93)	8.78
Excess			0.19	(0.47)	0.19	(4.77)	(1.79)	(4.06)
BERS-TOTAL PROGRESS	68	1.33	5.22	14.25	5.22	7.21	(3.19)	7.77
RUSSELL 3000 (DAILY)			5.74	15.04	5.74	12.74	0.48	12.56
Excess			(0.52)	(0.79)	(0.52)	(5.53)	(3.67)	(4.78)



	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2016	2015	2014
BERS-TOTAL FIS	(\$WIW) 67	1.32	3.39	21.50	3.39	17.54	(4.25)	1.80
RUSSELL 2000 (DAILY)			2.47	21.60	2.47	21.31	(4.41)	4.89
Excess			0.92	(0.10)	0.92	(3.77)	0.17	(3.10)
				( /		<u> </u>		(* - · /
NON - US EQUITY								
Sprucegrove MTA (BOE)	351	6.88	8.09	20.17	8.09	11.14	(9.56)	(3.19)
MSCI EAFE VALUE NET (DAILY)			6.05	19.31	6.05	5.02	(5.68)	(5.39)
Excess			2.05	0.87	2.05	6.12	(3.87)	2.21
Baillie Gifford MTA	354	6.94	12.22	18.07	12.22	0.70	(3.81)	(6.66)
MSCI EAFE GROWTH			8.52	7.60	8.52	(3.04)	4.09	(4.43)
Excess			3.70	10.46	3.70	3.74	(7.90)	(2.23)
Acadian	97	1.90	10.03	16.98	10.03	6.41	8.68	(4.92)
S&P EPAC Small Cap USD NET			8.04	13.18	8.04	1.34	8.58	(3.43)
Excess			1.99	3.80	1.99	5.07	0.09	(1.49)
EMERGING MARKETS								
ACADIAN	281	5.51	14.93	24.15	14.93	12.74	(15.14)	3.77
MSCI EMERGING MARKETS			11.44	16.44	11.44	11.19	(14.92)	(2.19)
Excess			3.49	7.70	3.49	1.55	(0.22)	5.96
BLACKROCK	106	2.07	11.66		11.66			
MSCI EMERGING MARKETS			11.44		11.44			
Excess			0.21		0.21			
FIXED INCOME SUMMARY								
STRUCTRED FIXED INCOME								
Blackrock Mortgages	173	3.40	0.68	(0.32)	0.68	2.32	1.73	
CITIGROUP MORTGAGE INDEX			0.43	(1.00)	0.43	1.59	1.56	
Excess			0.25	0.68	0.25	0.73	0.17	



	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2016	2015	2014
Prudential - Credit	139	2.72	1.29	(0.27)	1.29	5.86	(0.22)	7.20
NYC - Investment Grade Credit			1.38	(0.37)	1.38	5.56	(0.65)	7.04
Excess			(0.08)	0.10	(0.08)	0.30	0.43	0.16
Taplin Canida Habacht - Credit	119	2.34	1.84	2.16	1.84	8.02	(3.01)	8.68
NYC - Investment Grade Credit			1.38	(0.37)	1.38	5.56	(0.65)	7.04
Excess			0.46	2.52	0.46	2.46	(2.36)	1.64
Prudential-Privest - Credit	17	0.34	1.68	1.01	1.68	4.30	1.63	7.20
NYC - Investment Grade Credit			1.38	(0.37)	1.38	5.56	(0.65)	7.04
Excess			0.30	1.37	0.30	(1.26)	2.28	0.16
State Street Govt	128	2.51	1.23	(6.56)	1.23	1.23	0.45	12.21
NYC - Treasury Agency Plus Five		2.01	1.09	(6.75)	1.09	1.21	0.72	12.38
Excess			0.13	0.18	0.13	0.01	(0.27)	(0.16)
SSGA 1-3 Treasury Index	181	3.54	0.30		0.30			
Citigroup USBIG Treasury 1-3 Y Index	101	3.34	0.30		0.30			
Excess			0.03		0.03			
HIGH YIELD								
Loomis Sayles - High Yield	131	2.56	3.25	11.81	3.25	19.92	(7.07)	2.83
NYC-Loomis (BoA MLMSTII 7-03/BB&B PRIOR)			2.71	10.38	2.71	17.49	(4.64)	2.50
Excess			0.54	1.43	0.54	2.44	(2.43)	0.33
Shenkman - High Yield	131	2.57	2.08	8.06	2.08	11.62	(1.97)	2.66
CITIGROUP BB & B			2.28	9.20	2.28	15.48	(4.21)	2.78
Excess			(0.20)	(1.14)	(0.20)	(3.85)	2.24	(0.13)



	Market Value (\$MM)	% of Total	3 Month	FYTD	СҮТД	2016	2015	2014
BANK LOANS								
Babson BL	113	2.22	1.06	6.12	1.06	8.48	0.12	1.99
CSFB LEVERAGED LOAN INDEX			1.20	6.69	1.20	9.88	(0.38)	2.06
Excess			(0.14)	(0.57)	(0.14)	(1.39)	0.51	(0.07)
TIPS								
SSGA TIPS	238	4.67	1.25	(0.28)	1.25	4.78		
BBG BARC Gbl Inf-Lk: US TIPS (Dly)			1.26	(0.22)	1.26	4.68		
Excess			(0.01)	(0.06)	(0.01)	0.09		
ECONOMICALLY TARGETED INVESTMENTS								
ACCESS RBC	6	0.12	0.48	(1.25)	0.48	1.61	1.83	6.66
Access RBC Benchmark			0.46	(1.30)	0.46	1.52	1.40	5.08
Excess			0.02	0.05	0.02	0.09	0.43	1.58
AFL-CIO HOUSING INV TRUST	16	0.31	0.81	(1.68)	0.81	1.94	1.13	6.10
BBG BARC Agg (Dly)			0.82	(1.73)	0.82	2.65	0.55	5.97
Excess			(0.01)	0.05	(0.01)	(0.71)	0.58	0.14
CPC CONST FACILITY	1	0.01	2.04	1.37	2.04	(3.95)	12.90	
CPC CONST BENCHMARK			0.83	2.41	0.83	3.12	2.90	
Excess			1.21	(1.04)	1.21	(7.07)	10.01	
BOA-PPAR (FNMA)	1	0.03	0.24	(6.54)	0.24	4.07	42.03	13.31
FNMA Plus 85bps			0.71	(0.50)	0.71	2.38	2.50	7.13
Excess			(0.47)	(6.04)	(0.47)	1.69	39.53	6.19
CCD-PPAR (FNMA)	1	0.02	0.35	(5.41)	0.35	3.71	6.69	25.71
FNMA Plus 85bps			0.71	(0.50)	0.71	2.38	2.50	7.13
Excess			(0.36)	(4.91)	(0.36)	1.33	4.20	18.58



	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2016	2015	2014
CCD-PPAR (GNMA)	0	0.01	0.06	(5.63)	0.06	2.78	5.08	15.37
GNMA Plus 65bps			0.42	(0.30)	0.42	2.28	2.02	6.65
Excess			(0.36)	(5.34)	(0.36)	0.50	3.06	8.72
CFSB-PPAR (GNMA)	0	0.00	0.23	(5.44)	0.23	3.21	5.90	15.34
GNMA Plus 65bps			0.42	(0.30)	0.42	2.28	2.02	6.65
Excess			(0.19)	(5.14)	(0.19)	0.93	3.88	8.69
CPC-PPAR (FNMA)	1	0.02	(0.80)	(5.79)	(0.80)	6.15	8.96	13.91
FNMA Plus 85bps			0.71	(0.50)	0.71	2.38	2.50	7.13
Excess			(1.50)	(5.29)	(1.50)	3.77	6.46	6.78
JPMC-PPAR (FNMA)	2	0.04	1.24	(1.64)	1.24	7.94	6.18	12.06
FNMA Plus 85bps			0.71	(0.50)	0.71	2.38	2.50	7.13
Excess			0.53	(1.14)	0.53	5.56	3.68	4.93
LIIF-PPAR (FNMA)	1	0.02	0.39	(11.80)	0.39	5.03	6.29	38.12
FNMA Plus 85bps			0.71	(0.50)	0.71	2.38	2.50	7.13
Excess			(0.32)	(11.30)	(0.32)	2.65	3.79	30.99
LIIF-PPAR (GNMA)	0	0.00	0.36	(2.43)	0.36	3.88	3.92	9.74
GNMA Plus 65bps			0.42	(0.30)	0.42	2.28	2.02	6.65
Excess			(0.06)	(2.13)	(0.06)	1.61	1.91	3.09
NCBCI-PPAR (FNMA)	0	0.00	(0.60)	(5.69)	(0.60)	3.46	4.97	14.93
FNMA Plus 85bps			0.71	(0.50)	0.71	2.38	2.50	7.13
Excess			(1.31)	(5.19)	(1.31)	1.07	2.47	7.81
NCBCI-PPAR (GNMA)	0	0.00	(0.04)	(5.36)	(0.04)	3.51	5.53	16.66
GNMA Plus 65bps			0.42	(0.30)	0.42	2.28	2.02	6.65
Excess			(0.46)	(5.07)	(0.46)	1.23	3.52	10.01



	Market Value (\$MM)	% of Total	3 Month	FYTD	CYTD	2016	2015	2014
CASH								
BOARD OF ED. SHORT TERM	66	1.29	0.23	0.45	0.23	0.55	0.39	0.28
91 DAY T-BILL			0.10	0.28	0.10	0.33	0.05	0.02
Excess			0.12	0.16	0.12	0.23	0.35	0.26
C/D - FAIL FLOAT EARNINGS	0	0.00						
SECURITY LENDING	3	0.06						



New York City Board of Education Retirement System

# **Appendix C**

## **Alternative Assets Manager Performance Detail**



	Vintage Year					Investment	
	(Cash Flow)	Commitments	Contributions	Distributions	Market Value	Multiple	ITD IRR%
TOTAL PRIVATE EQUITY		529,222,686	295,153,984	151,683,236	251,875,241	1.37	10.3%
TOTAL ACTIVE							
Mesirow Financial Private Equity Partnership Fund III, L.P.	2005	57,000,000	55,093,273	68,436,309	22,875,764	1.66	8.6%
Mesirow Financial Private Equity Partnership Fund IV, L.P.	2006	25,000,000	22,342,233	18,750,104	17,314,204	1.61	10.3%
New York Fairview Private Equity Fund, L.P.	2006	19,000,000	17,320,307	14,983,489	8,375,306	1.35	6.1%
Mesirow Financial Private Equity Partnership Fund V, L.P.	2009	45,000,000	34,439,326	15,307,954	40,332,487	1.62	15.8%
Platinum Equity Capital Partners III, L.P.	2012	15,000,000	14,218,681	11,587,852	11,291,776	1.61	49.8%
Warburg Pincus Private Equity XI, L.P.	2012	25,000,000	22,190,787	4,438,890	24,853,969	1.32	12.4%
Apollo Investment Fund VIII, L.P.	2013	20,000,000	11,868,129	1,027,866	12,479,556	1.14	11.9%
Carlyle Partners VI, L.P.	2013	20,000,000	12,130,979	3,208,758	10,514,009	1.13	8.0%
Landmark Equity Partners XV, L.P.	2013	19,000,000	7,795,118	3,438,372	5,755,129	1.18	11.3%
Landmark Equity Partners XV, L.P Side Car	2013	6,000,000	3,043,236	1,177,388	2,698,437	1.27	15.4%
CVC Capital Partners VI, L.P.	2013	16,810,261	9,670,315	118,425	10,024,003	1.05	5.0%
Crestview Partners III, L.P.	2013	15,000,000	4,598,843	75,827	4,399,792	0.97	N/M
Crestview Partners III (Co-Investment B), L.P.	2013	5,000,000	3,027,407	72,440	3,398,923	1.15	N/M
ASF VI, L.P.	2014	15,000,000	8,325,263	805,679	9,542,170	1.24	14.5%
ASF VI NYC Co-Invest, L.P.	2014	5,000,000	3,313,934	966,516	3,325,766	1.30	16.0%
Carlyle Partners VI, L.P Side Car	2014	2,200,000	1,193,842	-	1,101,066	0.92	-5.2%
Lexington Capital Partners VIII, L.P.	2014	20,000,000	5,134,814	1,631,596	5,083,318	1.31	N/M
Vista Equity Partners Fund V, L.P.	2014	25,000,000	24,315,235	4,650,465	22,951,277	1.14	9.8%
Centerbridge Capital Partners III, L.P.	2015	2,500,000	681,731	30,128	762,721	1.16	N/M
Siris Partners III, L.P.	2015	3,500,000	1,430,221	23,058	1,399,895	0.99	N/M
NYCBERS - 2012 Emerging Manager Program	<u>2012</u>	25,000,000	8,812,276	682,074	9,340,240	<u>1.14</u>	<u>11.0%</u>
American Securities Partners VII, L.P.	2015	8,000,000	1,623,122	73,119	1,579,784	1.02	N/M
ASF VII, L.P.	2015	10,000,000	935,000	80,842	1,000,558	1.16	N/M
ASF VII B NYC Co-Invest, L.P.	2015	6,000,000	600	-	600	1.00	N/M
NYCBERS - 2015 Emerging Manager Program	<u>2015</u>	30,000,000	870,700	13,817	902,169	<u>1.05</u>	<u>N/M</u>
Warburg Pincus Private Equity XII, L.P.	2015	21,500,000	3,859,250	23,326	3,514,231	0.92	N/M
Welsh, Carson, Anderson & Stowe XII, L.P.	2015	10,000,000	2,815,523	-	3,208,158	1.14	N/M
Bridgepoint Europe V, L.P.	2015	8,031,222	2,351,975	-	2,715,964	1.15	N/M

Through December 31, 2016



Bridgepoint Europe V Co-Invest	2015	2,665,605	553,673	-	542,363	0.98	N/M
EQT VII, L.P.	2015	16,114,782	5,496,731	30,712	4,953,695	0.91	N/M
Vista Equity Partners Fund VI, L.P.	2016	16,000,000	5,701,461	48,231	5,637,912	1.00	N/M
Apax IX USD, L.P.	2016	13,000,000	-	-	-	N/A	N/A
Ares Corporate Opportunities Fund V, L.P.	2017	10,000,000	-	-	-	N/A	N/A
Green Equity Investors VII, L.P.	2017	10,000,000	-	-	-	N/A	N/A
BC European Capital X, L.P.	2017	10,536,298	-	-	-	N/A	N/A
BC European Capital X Metro Co-Investment L.P.	2017	4,214,519	-	-	-	N/A	N/A

Through December 31, 2016



			Original	Total	Total		Total Value	
	Vintage Year	Style Sector	Commitment	Contributions	Distrubutions	Market Value	Multiple	Net IRR%
TOTAL PRIVATE REAL ESTATE			372,901,665	258,410,200	65,883,835	278,136,137	1.30	12.2%
TOTAL PRIVATE REAL ESTATE								
LaSalle Property Fund	2011	Core/Core Plus Portfolio	27,600,000	27,600,000	5,974,476	37,370,826	1.60	12.1%
UBS Trumbull Property Fund	2011	Core/Core Plus Portfolio	41,400,000	56,822,909	12,426,383	74,535,993	1.50	9.7%
NYC Asset Investor #2 LLC	2013	Core/Core Plus Portfolio	11,000,000	10,557,373	1,450,644	12,307,842	1.30	16.0%
MetLife Core Property Fund	2014	Core/Core Plus Portfolio	15,000,000	15,000,000	1,401,833	17,514,179	N/A	N/A
Exeter Industrial Core Club Fund II	2016	Core/Core Plus Portfolio	10,000,000	2,450,000	52,105	2,522,006	N/A	N/A
Jamestown Premier Property Fund	2016	Core/Core Plus Portfolio	5,000,000	5,137,182	455,236	4,846,808	N/A	N/A
NYCRS Artemis Co-Investment	2016	Core/Core Plus Portfolio	11,000,000	3,253,838	-	4,022,526	N/A	N/A
USAA Eagle Real Estate Fund	2016	Core/Core Plus Portfolio	10,000,000	7,735,162	-	8,527,372	N/A	N/A
Brookfield Premier Real Estate Partners	2017	Core/Core Plus Portfolio	10,000,000	4,715,030	-	5,114,482	N/A	N/A
Lion Industrial Trust - 2007	2017	Core/Core Plus Portfolio	10,000,000	-	-	-	N/A	N/A
Franklin Templeton Private Real Estate Fund	2011	Non-Core Portfolio	30,000,000	30,330,456	30,847,557	14,233,652	1.50	24.9%
Brookfield Strategic Real Estate Partners	2012	Non-Core Portfolio	10,000,000	10,634,866	3,797,149	11,721,425	1.50	17.6%
NYC Asset Investor #1 LLC	2013	Non-Core Portfolio	10,000,000	10,746,128	1,395,024	12,112,842	1.30	12.7%
NYC Asset Investor #3 LLC	2013	Non-Core Portfolio	8,000,000	3,335,361	31,308	3,792,367	1.10	9.1%
Blackstone Real Estate Partners Europe IV (USD Vehicle)	2014	Non-Core Portfolio	32,500,000	28,920,153	4,955,728	26,852,493	N/A	N/A
Carlyle Realty Partners VII	2014	Non-Core Portfolio	25,000,000	14,176,644	191,787	15,926,242	N/A	N/A
Blackstone Real Estate Partners VIII	2015	Non-Core Portfolio	16,500,000	7,132,514	1,788,214	6,516,204	N/A	N/A
H/2 Special Opportunities Fund III	2015	Non-Core Portfolio	15,000,000	12,993,856	844,314	14,262,659	N/A	N/A
Divco West Fund V	2016	Non-Core Portfolio	10,000,000	522,271	-	467,330	N/A	N/A
European Property Investors Special Opportunities IV (EPISO	2016	Non-Core Portfolio	11,176,931	2,004,474	272,080	1,656,507	N/A	N/A
PW Real Estate Fund III LP	2016	Non-Core Portfolio	10,624,734	2,322,022	-	2,047,672	N/A	N/A
Westbrook Real Estate Fund X	2016	Non-Core Portfolio	10,000,000	1,159,007	-	1,173,623	N/A	N/A
H/2 Special Opportunities Fund IV	2017	Non-Core Portfolio	10,000,000	860,955	-	870,571	N/A	N/A
Lone Star Real Estate Fund V	2017	Non-Core Portfolio	23,100,000	-	-	(259,485)	N/A	N/A



		Original	Total	Total		Total Value	
	Vintage Year	Commitment	Contributions	Distrubutions	Market Value	Multiple	Net IRR%
TOTAL INFRASTRUCTURE		91,600,000	38,243,488	1,835,809	40,694,627	1.11	9.1%
TOTAL INFRASTRUCTURE							
Brookfield Infrastructure Fund II	2013	10,000,000	7,680,659	857,938	8,732,648	1.25	14.8%
First Reserve Energy Infrastructure Fund II, L.P.	2014	15,000,000	5,048,851	184,953	6,030,267	N/A	N/A
IFM Global Infrastructure Fund	2014	15,000,000	15,475,768	475,768	16,558,267	N/A	N/A
KKR Global Infrastructure Investors II L.P.	2014	19,000,000	6,352,379	248,801	5,967,187	N/A	N/A
Brookfield Infrastructure Fund III, L.P.	2016	10,000,000	1,568,293	27,719	1,679,005	N/A	N/A
Global Infrastructure Partners III-A/B, L.P.	2016	12,000,000	2,117,538	40,630	1,727,253	N/A	N/A
Actis Energy 4	2017	10,600,000	-	-	-		



New York City Board of Education Retirement System

# **Appendix D**

Footnotes



• The Barclays Capital Aggregate (then known as the Lehman Brothers Aggregate) was used prior to 1/1/89. Effective 1/1/89, in the Government Sector, maturities of less than 5 years were dropped from the Salomon and Lehman indices. From that date until 7/1/99 the benchmark was the NYC Core + 5, from Lehman.

- Effective 7/1/94, the NYC Core + 5 Index includes BBB rated securities.
- Effective 7/1/99, the basis of the NYC Index was changed from Lehman Brothers to Salomon. Also effective 7/1/99, only Salomon indices have been used to compare all fixed income managers.
- Effective 4/1/03, the name of the benchmark provider was changed from Salomon to Citigroup.
- Effective 7/1/03, the "NYC-Loomis" benchmark index for the Loomis Sayles Enhanced Yield portfolio reflects a change from the Citigroup BB&B Index to the more appropriate BofA Merrill Lynch High Yield Master II Index.
- Effective 7/1/09, the Core+5 program was restructured.

• The U.S. Gov't sector benchmark Index was changed from the Citigroup Core+5 Treasury/Gov't Sponsored Index to the Citigroup Core+5 Treasury/Agency Index.

• The Corporate and Yankee sectors were combined to form the new Investment Grade Credit sector. The benchmark for the new combined sector is the customized Citigroup Credit Index. For historical performance purposes, the old Corporate sector Index is linked to the new Credit sector Index.

- There were no changes to the Mortgage sector Index.
- The total Core+5 results and benchmark returns combine the three sectors. Historical total Core+5 returns continue to include the old Corporate and Yankee sector returns.



#### **General Notes**

- Estimated management fees for public market investments are calculated on an accrual basis without adjustment for management fee caps. Alternative investment fees are recorded on a cash basis. Since not all alternative managers currently provide detailed fee disclosure, the alternative investment fees noted here are not comprehensive.
- Public Market returns are Net of Manager Fees for periods after January 2014 and Gross of investment advisory fees for other periods unless otherwise indicated.
- Public market excess returns for periods prior to 2014 are based on Gross performance.

#### Page Specific

#### Page 12-17 - Portfolio Asset Allocation

• Rebalancing Ranges: the minimum and maximum weights that actual Asset Allocation may reach before rebalancing between Asset Classes is necessary.

#### Pages 18 - 20 - Performance Attribution: Total Plan

- Plan Return at Policy Weights: the return of the Total Plan assuming actual Asset Class results were maintained at target (Adjusted Policy) weights. *Figure = (Return of Asset Class 1\* Target Weight) plus (Return Of Asset Class 2\* Target Weight) plus (.....)*
- Allocation Effect = Total Plan Return minus Plan Return At Adjusted Policy Weights. Allocation is the Contribution to Performance resulting from an overweight or underweight to an asset class. E.g. an underweight to an Asset Class that under-performs results in a positive Allocation Effect and vice versa.
- Selection Effect = Equal to the Custom Benchmark (Adjusted Policy Index) Return minus Plan Return at Adjusted Policy Weights. This illustrates how the Managers have added or removed value based on their Security Selection decisions, e.g., If the manager's Actual Returns are higher than the Implied Return there will be a positive Selection Effect.

#### • Policy Index = Custom Benchmark

The "policy index" is a custom benchmark representing the weighted average return of the weighted benchmark indexes for each major investment program. Weights may reflect an adjustment of actual policy for outstanding commitments for new or revised programs, such as for private market programs, which are invested gradually, or for any new or updated program requiring the completion of RFPs and contracts. The policy index/custom benchmark is calculated monthly based on adjusted policy weights at the beginning of each month.



The indexes and most recent policy weights are as follows: U.S. Equity: Russell 3000 \* 36.22% International Developed (EAFE) Markets: MSCI EAFE IMI Net \* 13.57% Emerging Markets: MSCI Emerging Markets \* 7.16% REITs: Dow Jones Real Estate Securities \* 0.00% Private Equity: Russell 3000 + 300 b.p. per annum \* 4.99% Private Real Estate - Core: NFI - ODCE Net \* 3.47% Private Real Estate – Non Core: NFI - ODCE Net + 200bps \* 2.15% Infrastructure: CPI + 4% \* 0.83% US Treasury Short Term: Citigroup USBIG Treasury 1-3Y \* 0.00% US Treasury Intermediate Long: NYC Treasury Agency + 5 \* 9.56% US Treasury Long Duration: Citigroup Treasury 10+ \* 0.00% Core Fixed Income: BBG Barc Agg \* 0.00% Progress Fixed: BBG Barc Agg \* 0.00% Mortgage: Citigroup Mortgage Index \* 4.05% ETI: ETI Custom Benchmark \* 0.58% Investment Grade Credit: NYC – Investment Grade Credit \* 4.63% *High Yield: Citigroup BB&B \* 6.00%* Bank Loans: Credit Suisse Leveraged Loan \* 2.00% TIPS: Lehman U.S. TIPS \* 4.79%



#### Page 21 – Allocation and Selection Effects - Asset Class Breakdown

• This chart aims to break down the Allocation and Selection Effects shown on the Performance Attribution pages. The aim of the Page is to show the asset classes where Managers are either out performing or under performing their benchmark and to show the basis point effect that this is having on Plan performance.

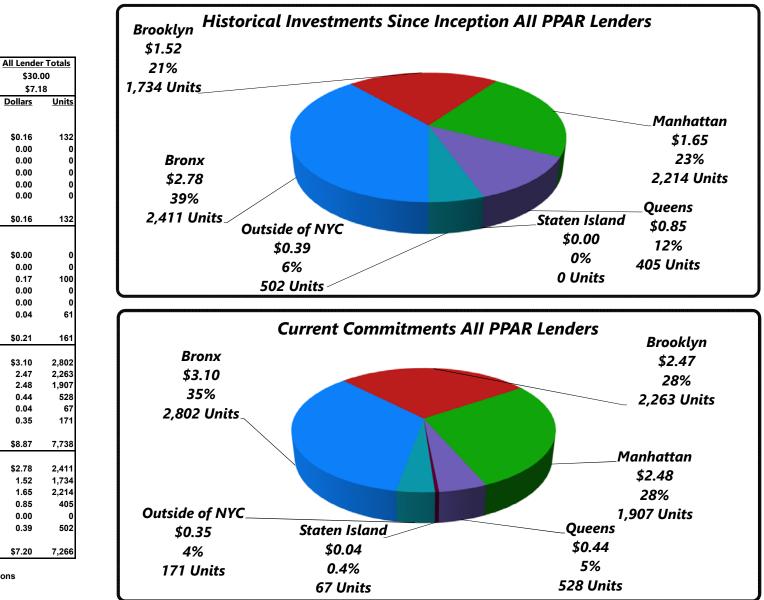
ETI Quarterly Report a/o March 31, 2017:

Lenders*	BOA	CCD	T	CFSB	CPC		JPM	1	LIIF	T	NCBCI	T	NHS	W	F	LISC		BE	<u> </u>	HDC
Contractual Commitment <sup>1</sup>	\$4.00	\$4.00		<u>\$1.00</u>	<u> 4.00</u>		\$5.00		<u>LIIF</u> 54.00		\$1.00	-	\$1.00	\$2	_	\$1.00		\$1.00		\$2.00
	-			-			-						-			-				
Current Market Value <sup>1</sup>	\$1.32	\$1.29		\$0.13	\$0.93		\$2.12		1.28		\$0.11		\$0.00	\$0		\$0.00		\$0.00		\$0.00
	<u>Dollars</u> <u>Un</u>	<u>ts</u> <u>Dollars</u>	Units	Dollars Units	<u>Dollars</u>	Units	Dollars Un	its Do	ollars Ur	nits	Dollars U	Jnits	Dollars Unit	<u>s</u> Dolla	rs Unite	<u> </u>	nits	Dollars	Units	Dollars Units
Commitments Q1																				
<u>(included in total)</u>			-																	
Bronx	\$0.00	0 \$0.00	0	\$0.00 0	\$0.03	52			60.00	0	\$0.00	0	*****	\$0.0			0	\$0.00	0	\$0.00 0
Brooklyn	0.00	0.00	0	0.00 0		0	0.00	0	0.00	0	0.00	0	0.00	0.0			0	0.00	0	0.00 0
Manhattan	0.00	0.00	0	0.00 0		0	0.00	0	0.00	0	0.00	0	0.00	0.0			0	0.00	0	0.00 0
Queens	0.00	0.00	0	0.00 0		0	0.00	0	0.00	0	0.00	0	0.00	0.0			0	0.00	0	0.00 0
Staten Island	0.00	0 0.00	0	0.00 0		0	0.00	0	0.00	0	0.00	0	0.00	0.0		0.00	0	0.00	0	0.00 0
Outside of NYC	0.00	0 0.00	0	0.00 0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Total	\$0.00	0 \$0.00	0	\$0.00 0	\$0.03	52	\$0.13	80 9	\$0.00	0	\$0.00	0	\$0.00	\$0.0	0 0	\$0.00	0	\$0.00	0	\$0.00 0
Delivered Q1																				
(included in total)																				
Bronx	\$0.00	0 \$0.00	0	\$0.00 0	\$0.00	0	\$0.00	0 9	60.00	0	\$0.00	0	\$0.00	\$0.0	0 0	\$0.00	0	\$0.00	0	\$0.00 0
Brooklyn	0.00	0.00	0	0.00 0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Manhattan	0.00	0.00	0	0.00 0	0.00	0	0.17 1	00	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Queens	0.00	0.00	0	0.00 0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Staten Island	0.00	0.00	0	0.00 0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Outside of NYC	0.00	0.00	0	0.00 0	0.04	61	0.00	0	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Total	\$0.00	0 \$0.00	0	\$0.00 0	\$0.04	61	\$0.17 1	00 9	60.00	0	\$0.00	0	\$0.00	\$0.0	0 0	\$0.00	0	\$0.00	0	\$0.00 0
Total Commitments																				
Bronx	\$0.00	0 \$0.74	283	\$0.00 0	\$0.33	1,245	\$1.58 1,0	75 \$	60.26	61	\$0.00	0	\$0.00	\$0.0	8 90	\$0.11	48	\$0.00	0	\$0.00 0
Brooklyn	0.47 3	46 0.69	229	0.00 0	0.26	886	0.06	80	0.52	207	0.00	0	0.00	0.0	0 0	0.25	156	0.22	359	0.00 0
Manhattan	0.34 1	0.00	0	0.00 0	0.34	1,093	0.12 1	14	0.79 2	224	0.00	0	0.00	0.4	8 203	0.20	90	0.21	83	0.00 0
Queens	0.09	54 0.00	0	0.00 0	0.13	406	0.22	68	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Staten Island	0.00	0.00	0	0.00 0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.0	4 67	0.00	0	0.00	0	0.00 0
Outside of NYC	0.09	39 0.21	41	0.00 0	0.01	25	0.03	66	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Total	\$0.98 5	39 \$1.64	553	\$0.00 0	\$1.08	3,655	\$2.01 1,4	03 9	61.57 <i>4</i>	492	\$0.00	0	\$0.00	\$0.6	0 360	\$0.56	294	\$0.43	442	\$0.00 0
Historical Investments																				
Bronx	\$0.26	60 <b>\$0.63</b>	519	\$0.00 0	\$0.18	839	\$1.46 8	76 5	60.25 ·	117	\$0.00	0	\$0.00	\$0.0	0 0	\$0.00	0	\$0.00	0	\$0.00 0
Brooklyn	0.28	0.32	252	0.00 0	0.33	1,002	0.23 1	37	0.37	289	0.00	0	0.00	0.0	0 0	0.00	0	0.00	o	0.00 0
Manhattan	0.00	0 0.24	283	0.16 197		1,064		19		328	0.10	123	0.00	0.0			0	0.00	0	0.00 0
Queens	0.75 2	39 0.04	54	0.00 0	0.01	16		96	0.00	0	0.00	0	0.00	0.0	0 0	0.00	0	0.00	0	0.00 0
Staten Island	0.00	0 0.00	0	0.00 0		0	0.00	0	0.00	ō	0.00	Ő	0.00	0.0		0.00	0	0.00	ō	0.00 0
Outside of NYC	0.00	0 0.00	ō	0.00 0		446		56	0.00	0	0.00	Ō	0.00	0.0			0	0.00	ō	0.00 0
			Ĩ		0.20					-		J			- •		-		Ĩ	
Total	\$1.29 3	53 \$1.22 1	1,108	\$0.16 197	\$0.93	3,367	\$2.14 1.3	84 5	61.34	734	\$0.10	123	\$0.00	\$0.0	0 0	\$0.00	0	\$0.00	o	\$0.00 0
*Lenders :	Bank of	Citi Commu		Carver Federal	The Commu	,	JP Morgan	-	Income		NCB Capi	-	Neighborhood	Wells	-	Local Initiativ	- /es	Bellwethe	er	NYC HDC
	America	Developme	•	Savings Bank	Preservation	•	Chase		ment Fun	nd	Impact		Housing Service			Support Cor		Enterpris		
<sup>1</sup> Dollar amount listed in mil				<b>-</b>															-	

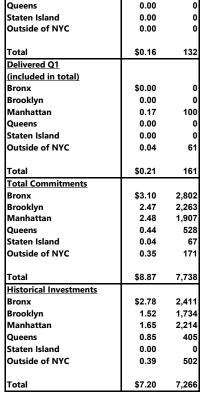
#### Public/Private Apartment Rehabilitation Program (PPAR)

<sup>1</sup> Dollar amount listed in millions

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Public/Private Apartment Rehabilitation Program (PPAR)



Lenders\*

Bronx

Brooklyn

Manhattan

Contractual Commitment<sup>1</sup>

Current Market Value<sup>1</sup>

Commitments Q1

(included in total)

\$30.00

\$7.18 Dollars

\$0.16

0.00

0.00

<sup>1</sup> Dollar amount listed in millions

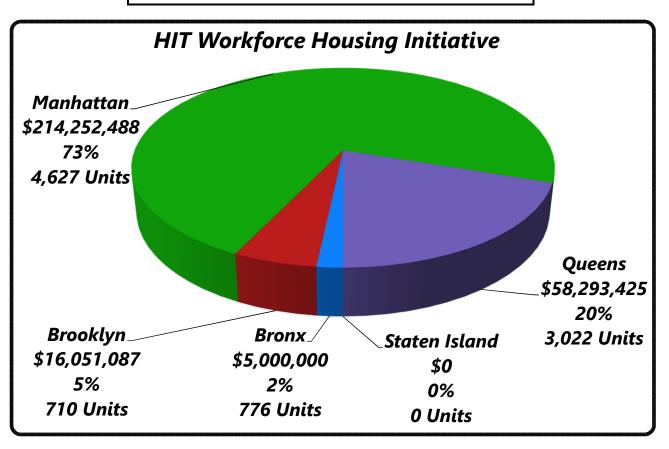
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**AFL-CIO Housing Investment Trust (HIT)** Market Value \$15.74 million<sup>1</sup> NYCCII Multifamily Program Manhattan NYC Community Investment Initiative (NYCCII) \$346.096.900 49% NYCCII Phase I: NYCCII Phase II: Grand Total 7.721 Units 2002 - 2005 2006 - 2013 Borough **Investments** Units<sup>2</sup> Investments Units<sup>2</sup> Investments Units<sup>2</sup> Queens \$27,600,000 1.886 \$80,427,900 2,688 Bronx \$52,827,900 802 \$17,760,000 49,501,800 3,230 103,890,446 5,616 153,392,246 Brooklyn 8,846 3% 6.908 Manhattan 172,021,700 174,075,200 813 346.096.900 7.721 1,149 Units **Oueens** 0 17,760,000 1,149 17,760,000 1,149 0 Staten Island 0 0 6,414,554 693 6,414,554 693 Brooklyn Staten Island **Outside NYC** 137 100,000,000 137 0 0 100,000,000 \$153,392,246 \$6.414.554 Total \$249,123,500 12,024 \$454,968,100 9.210 \$704,091,600 21.234 22% 1% 8.846 Units **Outside NYC** Bronx 693 Units \$80.427.900 \$100.000.000 11% 14% 2,688 Units 137 Units HIT Home Mortgage Program NYCCII Phase I: NYCCII Phase II: Grand Total Home Mortgage Program Manhattan 2002 - 2005 2006 - 2013 \$224,986,933 Borough \$ Amount Loans \$ Amount Loans \$ Amount Loans 8% Bronx \$32,544,168 41 \$218.082.108 296 \$250.626.276 337 Queens 277 Units Brooklyn 116,575,736 138 864,892,271 1,115 981,468,007 1,253 \$976,798,735 Manhattan 10,742,253 12 214,244,680 265 224,986,933 277 34% 1.037 Units 894,399,418 973 976,798,735 Queens 82,399,317 64 1,037 106,039,089 191 439 466,019,549 630 Staten Island 359,980,460 446 3,088 3,534 Total \$348,300,563 \$2,551,598,937 \$2,899,899,500 0 Phase II: 13 13 **BERS Loans** Phase I: Total: Brooklvn <sup>1</sup>Interest is reinvested \$981.468.007 Staten Island <sup>2</sup>Low/Moderate Income Units 34% \$466,019,549 Bronx-1,253 Units 16% \$250,626,276 630 Units

### **Collateral Benefits as of 3/31/2017**

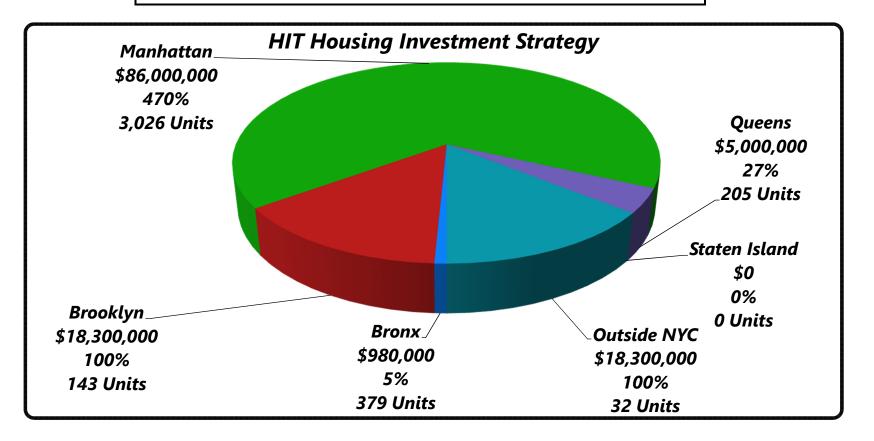
9% 337 Units

	vestment Trust (HIT)						
NYC Workforce Hou	NYC Workforce Housing Initiative: 2009 - 2015						
	Investments_	Low/Mod Units					
<u>Borough</u>	Since Inception	Since Inception					
Bronx	\$5,000,000	776					
Brooklyn	16,051,087	710					
Manhattan	214,252,488	4,627					
Queens	58,293,425	3,022					
Staten Island	0	(					
Total	\$293,597,000	9,135					



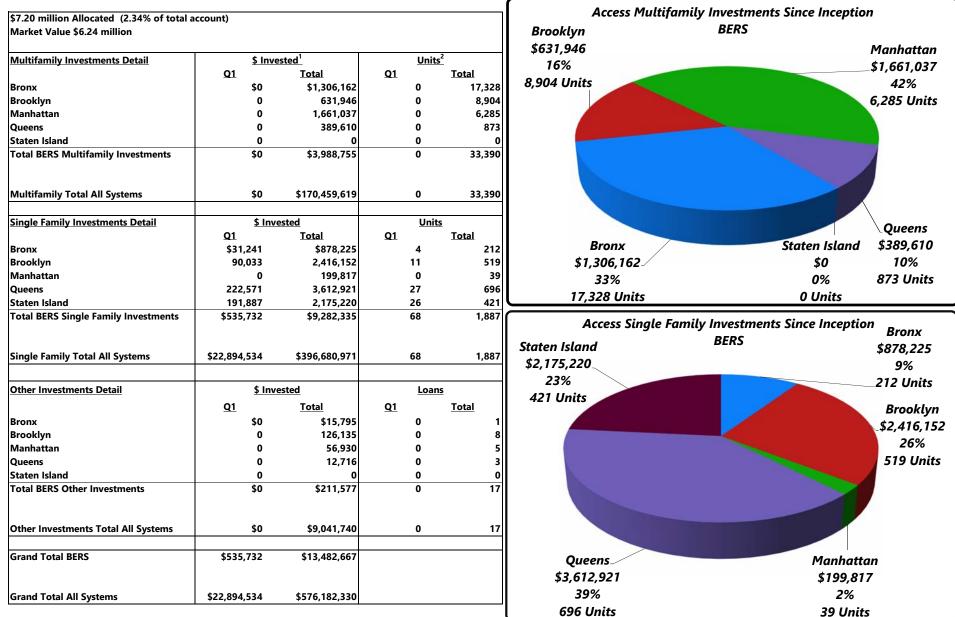
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	estment Strategy: 201	<b>~ ~ . . . . . . . . . .</b>		
		<b>Investments</b>		LMI Unit
<u>Borough</u>	Q1 Investments	Since Inception	<u>Q1 LMI Units</u>	Since Inception
Bronx	\$0	\$980,000	0	379
Brooklyn	0	18,300,000	0	143
Manhattan	55,000,000	86,000,000	2820	3,02
Queens	0	5,000,000	0	20
Staten Island	0	0	0	
Outside NYC	0	18,300,000	0	32
Total	\$55,000,000	\$128,580,000	2,820	3,78



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ACCESS CAPITAL STRATEGIES (Since Inception 2/1/07)



<sup>1</sup> Certain bond investment amounts are allocated pro rata across boroughs based upon unit count.

<sup>2</sup> If not indicated otherwise, superintendent units are allocated based on building size.

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## Private Equity Quarterly Report a/o December 31, 2016:





## NYC Board of Education Retirement System

Fourth Quarter 2016 Report

### Content

- Section 1 Portfolio Update
- Section 2 Portfolio Assessment
- Section 3 Funds-of-Funds Review
- Appendix A Glossary of Terms
- Appendix B Disclosure Statements

Fourth Quarter 2016 Report



# Section 1:

Portfolio Update

#### **Portfolio Snapshot**

Hamilton Lane was engaged by the NYC Board of Education Retirement System ("BERS") in November 2012 to provide alternative investment fund administration services in accordance with the investment objectives of the BERS Private Equity portfolio (the "Portfolio"). This report represents the review by Hamilton Lane of the BERS's Portfolio and is based on information made available to Hamilton Lane by the general partners sponsoring each of the partnership investments in the Portfolio as of December 31, 2016, with highlights through March 31, 2017.

**Private Equity Allocation:** BERS has a target allocation of 9.0% to Private Equity. As of December 31, 2016, Private Equity constituted 5.2% of BERS total plan. (Plan value is \$4.832billion as of December 31, 2016)

**Performance:** As of December 31, 2016, the Portfolio consisted of 42 active partnerships from 30 underlying fund managers. The Portfolio has generated a since inception internal rate of return ("IRR") of 10.29% and a total value multiple of 1.37x.

Portfolio Summary							
\$ in millions	9/30/2016	12/31/2016	Change				
Active Partnerships	42	42	-				
Active GP Relationships	30	30	-				
Capital Committed <sup>(1)(2)</sup>	\$532.1	\$529.2	(\$2.9)				
Unfunded Commitment	\$269.4	\$246.5	(\$22.9)				
Capital Contributed	\$273.4	\$295.2	\$21.8				
Capital Distributed	\$137.1	\$151.7	\$14.6				
Market Value	\$236.8	\$251.9	\$15.1				
Total Value Multiple	1.37x	1.37x	0.00x				
Since Inception IRR	10.15%	10.29%	14 bps				
Avg. Age of Active Commitments	4.0 years	4.2 years	0.2 years				

<sup>(1)</sup>The "change" in capital committed from the prior quarter reflects currency adjustments from existing foreign denominated funds.

<sup>(2)</sup> Includes only commited capital in the 2012 and 2015 Emerging M anager Programs

**Portfolio Exposures:** The Corporate Finance/Buyout strategy represents 52% of the Portfolio's total exposure, Growth Equity represents 14%, Secondary represents 13%, Special Situations/Turnaround represents 8%, Venture Capital accounts for 6%, Co-Investment represents 6%, and Other represents 1%. Strategic exposure takes into account the strategies for each of the underlying partnerships in the funds-of-funds within the BERS Portfolio.

Fourth Quarter 2016 Report

#### **Portfolio Overview**

#### Commitments

The table below highlights all funds closed during 2016.

	YTD Commitments - 2016							
Closing Date	Partnership	Investment Strategy	Commitment (\$ in Millions)					
1/15/2016	Stellex Capital Partners, L.P.	Special Situations/Turnaround	\$4.0					
4/25/2016	Green Equity Investors VII, L.P.	Corporate Finance/Buyout - Large	\$10.0					
5/26/2016	Vista Equity Partners Fund VI, L.P.	Corporate Finance/Buyout - Mega	\$16.0					
5/27/2016	Apax IX USD, L.P.	Corporate Finance/Buyout - Mega	\$13.0					
6/30/2016	BC European Capital X, L.P.	Corporate Finance/Buyout - Large	€10.0/\$11.2					
6/30/2016	BC European Capital X Metro Co-Investment L.P.	Co/Direct Investment	€4.0/\$4.5					
9/15/2016	FTV V, L.P.	Growth Equity	\$3.5					
Total			\$62.2					

The Portfolio closed on seven new investment, totaling \$62.2 million, which are detailed below:

**Stellex Capital Partners, L.P. (\$4.0 million)** the fund, the first commitment of the Emerging Manager 2015 Program, will target middle-market distressed and special situation opportunities primarily within the United States but may also opportunistically invest in Europe. The fund will seek control through equity buyouts or debt restructuring.

**Green Equity Investors VII, L.P. (\$10.0 million)** the fund will seek to invest in market-leading companies with attractive growth prospects across a broad range of industries within the U.S., with a preference for companies primarily in the following sectors: retail/consumer, healthcare/wellness, business/consumer services, and distribution.

**Vista Equity Partners Fund VI, L.P. (\$16.0 million)** the fund targets upper middle-market enterprise software companies in a relatively fragmented and expanding market. The fund seeks control positions in investments and intends to contribute significant value-add capabilities through board representation and their involvement.

**Apax IX USD, L.P. (\$13.0 million)** the fund will invest in buyouts in large cap companies mainly in Europe and North America. The fund targets four core sectors: consumer, healthcare, services, and technology and telecommunications. The fund seeks to invest in majority positions in order to gain control and drive value post-investment.

**BC European Capital X, L.P. (€10.0/\$11.2 million)** the fund will invest primarily in control buyouts of upper midand large-sized companies, focusing mainly in Europe, with select investments in the North America.

BC European Capital X Metro Co-Invest L.P. (€4.0/\$4.5 million) the fund is a co-investment vehicle related to the BC European Capital X, L.P. commitment.

**FTV V, L.P. (\$3.5 million)** the fund, an Emerging Manager 2015 Program commitment, will target enterprise technology & services, financial services, and payments & transaction processing sectors primarily in the United States. Investments to established, high-growth companies in the lower middle market will range between \$20 million and \$80 million.



## Fourth Quarter 2016 Report

#### **Subsequent Closings**

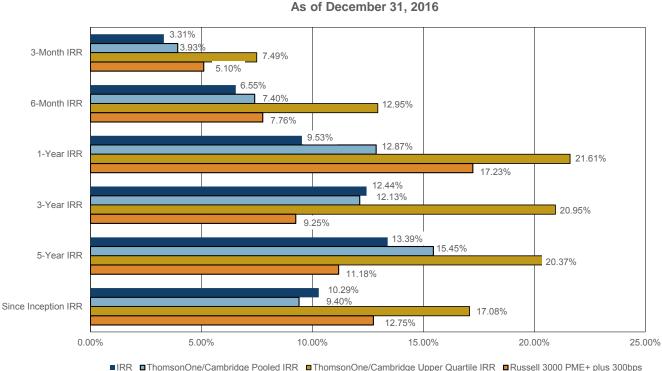
	Subsequent Closings - 2016							
Closing Date	Partnership	Investment Strategy	Commitment (\$ in Millions)					
2/28/2017	Platinum Equity Capital Partners IV, L.P.	Special Situations/Turnaround	\$11.5					
Total			\$11.5					

**Platinum Equity Capital Partners IV, L.P. (\$11.5 million)** The Fund will invest across sectors, primarily targeting healthy businesses in the United States, and may make selective investments in Europe and ROW as its operational expertise has broad application.

#### Fourth Quarter 2016 Report

#### Portfolio Performance Summary

The chart below is a graphical depiction of the IRR performance of the Portfolio with respect to 3-Month, 6-Month, 1-Year, 3-Year, 5-Year, and Since Inception time periods. The Portfolio is benchmarked against the ThomsonOne/Cambridge Pooled IRR, and ThomsonOne/Cambridge Upper Quartile IRR, as well as the Russell 3000 Total Return Public Market Equivalent ("PME+") plus 300 bps.



IRR Performance vs. Benchmarks As of December 31, 2016

Note: Private Equity benchmark is provided by ThomsonOne/Cambridge and reflects U.S. Buyout Funds Pooled IRR and Upper Quartile IRR as of September 30, 2016, for funds with vintage years 2005, 2006, 2009, 2012, 2013, 2014, 2015, 2016 and 2017. PME+ is the Russell 3000 Total Return Index and incorporates the PME+ methodology. This calculation includes a 3.0% premium.

- As private equity is a long term asset class, the most significant time horizon is the since inception time period. Performance on a since inception basis for the fourth quarter of 2016 increased 14 basis points from the prior quarter, with the Portfolio generating an IRR of 10.29%.
  - Relative to benchmarks, the since inception IRR is outperforming the ThomsonOne/Cambridge Pooled IRR by 89 basis points, but is underperforming the ThomsonOne/Cambridge Upper Quartile IRR by 679 basis points and the Russell 3000 PME+ plus 300 basis points premium by 246 basis points.
- Performance on a one-year basis for the fourth quarter 2016 increased 36 basis points from the prior quarter, with the Portfolio generating an IRR of 9.53%.
  - Relative to the benchmarks, the one-year IRR is underperforming the ThomsonOne/Cambridge Pooled IRR by 334 basis points, the ThomsonOne/Cambridge Upper Quartile IRR by 1,208 basis points and the Russell 3000 PME+ plus 300 bps by 770 basis points.

#### Vintage Year Performance

The table below details IRR performance of the Portfolio with respect to Vintage Year. The Portfolio is benchmarked against the ThomsonOne/Cambridge Median Quartile IRR, the ThomsonOne/Cambridge Upper Quartile IRR, and the Russell 3000 Public Market Equivalent.

	Performance by Vintage Year <sup>(1)</sup>								
Vintage Year	Capital Committed	IRR	ThomsonOne/ Cambridge Median Quartile IRR <sup>(2)</sup>	ThomsonOne/ Cambridge Upper Quartile IRR <sup>(2)</sup>	PME Benchmark <sup>(3)</sup>	PME Spread <sup>(4)</sup>			
2005	\$ 57,000,000	8.62%	8.12%	13.49%	8.34%	0.28%			
2006	44,000,000	8.43%	8.76%	14.65%	10.71%	(2.28%)			
2009	45,000,000	15.82%	19.49%	26.47%	12.80%	3.02%			
2012	40,000,000	20.97%	15.53%	24.25%	11.81%	9.16%			
2013	110,010,261	10.12%	10.37%	17.06%	8.83%	1.29%			
2014	73,650,000	11.81%	10.32%	15.39%	8.20%	3.61%			
2015	92,311,609	N/M	N/M	N/M	N/M	N/M			
2016	29,000,000	N/M	N/M	N/M	N/M	N/M			
2017	38,250,817	N/A	N/A	N/A	N/A	N/A			

<sup>(1)</sup> For details regarding Paid-In Capital, Distributions and Market Value by Vintage Year please see Section 3 of the report, Portfolio Assessment.

<sup>(2)</sup> ThomsonOne/Cambridge Benchmark - U.S. Buyouts as of 12/31/2016.

<sup>(3)</sup> PME is the Russell 3000 Total Return Index and incorporates the PME+ methodology for partnerships where distributions have occurred, and incorporates the Long Nickel methodologies for those partnerships that have not yet had any distributions to date.

<sup>(4)</sup> PME Spread is the percentage difference between the IRR and PME Benchmark for each respective partnership.

- Vintage year 2012 has generated the highest since inception IRR for the Portfolio at 20.97% and is outperforming the ThomsonOne/Cambridge Median Quartile IRR by 544 basis points and the Russell 3000 PME+ by 995 basis points, but is underperforming the ThomsonOne/Cambridge Upper Quartile IRR by 328 basis points.
  - The top performing partnership in the vintage year 2012 is Platinum Equity Capital Partners III, L.P., a Special Situations/Turnaround partnership, which has generated a since inception IRR of 49.79%.

#### **Quarterly Value Analysis**

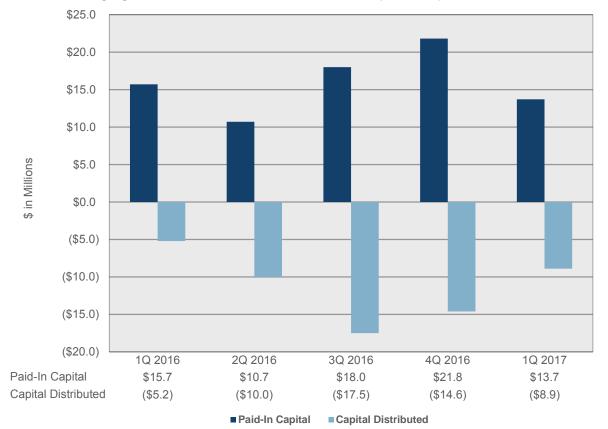
The table below details quarterly performance of the Portfolio for the year ending December 31, 2016.

Portfolio Summary						
		Quarter	Ending		Year Ending	
\$ in millions	3/31/2016	6/30/2016	9/30/2016	12/31/2016	12/31/2016	
Beginning Market Value	\$211.8	\$222.1	\$229.1	\$236.8	\$211.8	
Paid-in Capital	15.7	10.7	18.0	21.8	66.1	
Distributions	(5.2)	(10.0)	(17.5)	(14.6)	(47.3)	
Net Value Change	(0.2)	6.3	7.2	7.9	21.3	
Ending Market Value	\$222.1	\$229.1	\$236.8	\$251.9	\$251.9	
Unfunded Commitments	\$234.0	\$281.7	\$269.4	\$246.5	\$246.5	
Total Exposure	\$456.1	\$510.8	\$506.2	\$498.4	\$498.4	
Point to Point IRR	(0.11%)	2.8%	3.13%	3.31%	9.53%	
Since Inception IRR	9.96%	10.03%	10.15%	10.29%	10.29%	

- Over the past twelve months, the Portfolio has experienced a total of \$21.3 million in net value appreciation.
- During the past four quarters, the Portfolio has consistently been in a cash flow outflow position, deploying more capital than was returned via distributions. Contributions of \$66.1 million outpaced distributions of \$47.3 million during the twelve months ending December 31, 2016.
- Market value and unfunded commitments have increased over the past twelve months due to recent capital commitments. Total exposure, the sum of market value and unfunded commitments provide a snapshot of the PE Portfolio's capital at work, increased 9% during the year.

## NYC Board of Education Retirement System Fourth Quarter 2016 Report

#### **Cash Flow Drivers**



The chart below highlights the cash flows of the Portfolio over the past five quarters ended March 31, 2017.

- During the fourth quarter contributions increased by 21.1% from the prior quarter, while distributions slowed by 16.6%. Contributions continued to outpace distribution during the quarter, resulting in a net cash outflow of \$7.2 million.
  - CVC Capital Partners VI, L.P. called the most capital during the fourth quarter of 2016, calling \$3.4 million for multiple investments. The largest contribution during the quarter was for investments in Petco and Tipico totaling \$1.7 million. The investment to Petco was made in USD.
    - Petco, headquartered in San Diego, CA, is a national specialty retailer of pet food and supplies. The fund made an initial investment of \$4.6 billion in the fourth quarter.
    - Tipico, based in Malta, is a leading sports betting and casino games provider internationally. The fund made an initial investment of €1.3 billion in the fourth quarter.
  - The Portfolio received its largest distribution from Mesirow Financial Private Equity Partnership Fund V, L.P., a 2009 Fund-of-Funds partnership, which distributed \$3.6 million in proceeds from undisclosed investments. Through December 31, 2016, Mesirow Financial Private Equity Partnership Fund V, L.P has a 0.44x DPI (Distributions to Paid-in).

- Cash flow activity in the first quarter decreased from the prior quarter by 37.2% for contributions and 39.0% for distributions. Contributions continued to outpace distributions during the quarter, resulting in a net cash outflow of \$4.8 million.
  - Bridgepoint Europe V, L.P. called the most capital during the first quarter of 2017, calling \$1.9 million for investments in Sapic, Calypso, Peyman, and Sapec Agro.
  - The Portfolio received its largest distribution from Mesirow Financial Private Equity Partnership Fund V, L.P., which distributed \$1.8 million in proceeds from undisclosed investments. Through March 31, 2017, Mesirow Financial Private Equity Partnership Fund III, L.P. has realized a 2.67x DPI (Distributions to Paid-in).

#### Value Drivers

The table below displays the Portfolio's top five performance drivers by net value change for the quarter ending December 31, 2016.

Top Five Performing Investments for the Quarter Ending December 31, 2016								
Investment Name	Vintage Year	Net Value Change (\$ Millions)	Point-to-Point IRR	Since Inception IRR				
Mesirow Financial Private Equity Partnership Fund V, L.P.	2009	\$1.96	4.82%	15.82%				
Platinum Equity Capital Partners III, L.P.	2012	1.58	17.21%	49.79%				
Mesirow Financial Private Equity Partnership Fund IV, L.P.	2006	0.82	4.60%	10.27%				
Vista Equity Partners Fund V, L.P.	2014	0.54	2.40%	9.75%				
Warburg Pincus Private Equity XI, L.P.	2012	0.53	2.13%	12.39%				

- The above five partnerships generated an aggregated net value increase of \$5.43 million during the fourth quarter 2016.
  - Mesirow Financial Private Equity Partnership Fund V, L.P., a 2009 Fund-of-Funds partnership, generated a net value increase of \$1.96 million. CVC Capital Partners VI, L.P., an underlying fund, was the largest write-up during the quarter. CVC Capital Partners VI, L.P., a 2013 Buyout Fund, primarily targets European control and co-control buyouts of 20 to 25 portfolio companies with EVs and equity investments in the €1.0 to €2.0B and €300M to €500M range respectively
  - Platinum Equity Capital Partners III, L.P., a 2012 Special Situations/Turnaround partnership, generated a net value increase of \$1.58 million. Quarterly performance was also driven by Soter Capital, LLC. As of December 31, 2016, the investment, which was held at \$9.8 million in the prior quarter, is currently held at 1.4x cost, as its value was written up to \$295.3 million.
  - Mesirow Financial Private Equity Partners Fund IV L.P., a 2014 Fund-of-Funds partnership, generated a net value increase of \$0.82 million during the quarter. Thoma Bravo Fund IX, L.P., an underlying fund, was the largest write-up during the quarter. Thoma Bravo Fund IX, L.P., a 2008 Buyout fund, primarily targets companies in the software and services sectors (specifically focusing on business services, education, distribution, and financial services) and invests predominantly in the U.S.
  - Vista Equity Partners Fund V, L.P., a 2014 Large Buyout partnership, generated \$0.54 million in net value gain during the quarter. MediaOcean LLC experienced a 14.6% write up to market value during the quarter due to a repricing. As of December 31, 2016, the investment was valued at 1.35x cost, an increase from being held at 1.18x cost in the prior quarter.
  - Warburg Pincus Private Equity XI, L.P., a 2012 Growth Equity partnership, generated \$0.53 million in net value gain during the quarter. In aggregate, holdings were written up 1.6% from the prior quarter, resulting in an increase in TVPI from 1.44x in the prior quarter to 1.47x as of December 31, 2016. Overall, 24 investments were written up, 19 investments were written down, and 30 remained unchanged during the fourth quarter.

## NYC Board of Education Retirement System Fourth Quarter 2016 Report

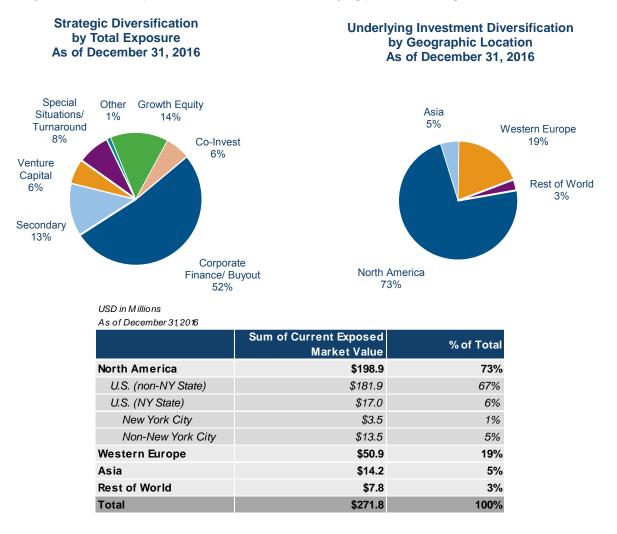
The table below shows the Portfolio's bottom five performance drivers by net value change for the quarter ending December 31, 2016.

Bottom Five Performing Investments for the Quarter Ending December 31, 2016							
Investment Name	Vintage Year	Net Value Change (\$ Millions)	Point-to-Point IRR	Since Inception IRR			
Mesirow Financial Private Equity Partnership Fund III, L.P.	2005	(\$0.81)	(3.09%)	8.62%			
New York Fairview Private Equity Fund, L.P.	2006	(0.20)	(2.21%)	6.13%			
EQT VII, L.P.	2015	(0.11)	(2.59%)	(18.80%)			
Mill City Fund II, L.P.	2014	(0.08)	(22.86%)	(42.15%)			
Vista Equity Partners Fund VI, L.P.	2016	(0.05)	(0.98%)	(0.40%)			

- The partnerships listed above generated a net value loss of \$1.25 million during the fourth quarter 2016. The majority of bottom drivers are comprised of recent vintage year funds, which typically experience jcurve impacts at the onset of a fund's life. In aggregate, the above partnerships generated a point-to-point IRR of (2.80%) during the fourth quarter of 2016.
- Mesirow Financial Private Equity Partnership Fund III, L.P. a 2005 Fund-of-Funds partnership, drove bottom performance during the quarter, generating a (3.09%) quarterly IRR. Since inception, the partnership generated a 8.62% IRR as of December 31, 2016. Negative performance was driven by two holdings, Brockway Moran & Partners Fund III, L.P and M/C Venture Partners VI, L.P.

#### **Portfolio Exposures**

The pie chart below represents the strategic and geographic diversification of the Portfolio as of December 31, 2016. Strategy is measured by total exposure, which is the sum of the market value and the unfunded commitments, providing a snapshot of the Portfolio's future diversification. Strategic exposure takes into account the strategies for each underlying partnership in the funds-of-funds within the BERS Portfolio. Geography is measured by the Portfolio's exposed market value of the underlying portfolio holdings.

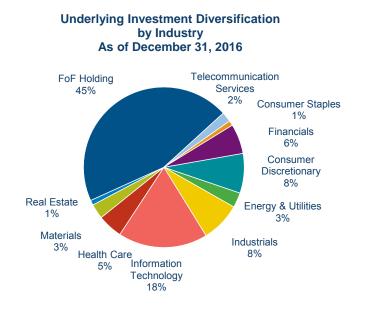


- The Portfolio is focused in the Corporate Finance/Buyout strategy, with 52% of the total exposure attributable to this strategy.
- With respect to geography, the Portfolio is concentrated in North America, with 73% of the Portfolio's underlying market value attributable to this region.
  - The remaining 27% of the Portfolio's exposure is diversified between Western Europe, Asia and 'Rest-of-World'.
  - Roughly 6% of the Portfolio's current exposed market value is based in New York, with 1% based in New York City companies and fund managers.



#### Fourth Quarter 2016 Report

The pie chart below represents the industry diversification of the Portfolio as of December 31, 2016. Industry diversification is measured by the Portfolio's exposed market value of the underlying portfolio companies and fund managers.



 The Portfolio has a large exposure to the FoF Holding sector (45%), representing nearly half of the Portfolio's total exposure. Commitments made to the three Mesirow Fund-of-Funds accounted for 66% of exposure to Fund-of-Funds holdings. FoF Holding exposure is expected to reduce as the Portfolio continues to make direct private equity fund commitments.

#### Fourth Quarter 2016 Report

#### Private Equity Company Exposure

The table below identifies the top ten underlying holdings held by partnerships in the BERS Portfolio, as measured by exposed market value as of December 31, 2016. As noted in the second column, the values of underlying holdings held by several partnerships have been aggregated.

Top 10 Partnership Holdings by Exposed Market Value December 31, 2016						
Partnership Name Partnership		Exposed Valuation (\$ in Millions)	% of Total Portfolio			
TIBCO Software, Inc.	Vista Equity Partners Fund V, L.P.	4.0	1.5%			
Solera Holdings Inc.	Vista Equity Partners Fund V, L.P.	3.9	1.4%			
WOW	Crestview Partners III, L.P. Crestview Partners III (Co-Investment B), L.P.	3.8	1.4%			
Marketo, Inc.	Vista Equity Partners Fund V, L.P. Vista Equity Partners Fund VI, L.P.	3.3	1.2%			
Lightspeed Venture Partners IX, L.P.	Mesirow Financial Private Equity Partnership Fund V, L.P.	3.3	1.2%			
New Enterprise Associates 13, L.P.	Mesirow Financial Private Equity Partnership Fund IV, L.P. Mesirow Financial Private Equity Partnership Fund V, L.P.	3.2	1.2%			
Thoma Bravo Fund X, L.P.	Mesirow Financial Private Equity Partnership Fund IV, L.P. Mesirow Financial Private Equity Partnership Fund V, L.P.	2.6	0.9%			
Vicente Capital Partners Growth Equity Fund (fka KH Growth Equity Fund)	New York Fairview Private Equity Fund, L.P.	2.5	0.9%			
TSG6 L.P.	Mesirow Financial Private Equity Partnership Fund IV, L.P. Mesirow Financial Private Equity Partnership Fund V, L.P.	2.5	0.9%			
Protection 1	Mesirow Financial Private Equity Partnership Fund III, L.P. Mesirow Financial Private Equity Partnership Fund IV, L.P.	2.5	0.9%			
Total		\$31.6	11.5%			

Note: Undisclosed fund investments are not included in this analysis.

- As of December 31, 2016, the top ten partnership holdings represent 11.5% of the total Portfolio's exposed market value, or \$31.6 million of exposed market value.
- Six of the ten top partnership holdings are held in multiple funds within the Portfolio.
- TIBCO Software, Inc., the Portfolio's largest exposure, a provider of message queue software for companies to use on-premises or as part of cloud computing environments. Vista Equity Partners Fund V, L.P. made its initial investment in December 2014. The investment was held at 1.05x cost as of December 31, 2016, down from 1.19x the prior quarter.

Fourth Quarter 2016 Report



# Section 2:

Portfolio Assessment

#### NYC Board of Education Retirement System Private Equity Portfolio As of December 31, 2016 (in USD)

	As of December 31, 2016 (in USD)												
Vintage Year	Investment	First Drawdown		Committed Capital	Pa	aid-In Capital	Distributed Capital		Market Value	Multiple	IRR <sup>1</sup>	PME Benchmark <sup>2</sup>	PME Spread <sup>3</sup>
Active In	vestments												
2005	Mesirow Financial Private Equity Partnership Fund III, L.P.	7/20/2006	\$	57,000,000	\$	55,093,273	\$ 68,436,309	\$	22,875,764	1.66x	8.62%	8.36%	0.25%
2006	Mesirow Financial Private Equity Partnership Fund IV, L.P.	3/31/2008		25,000,000		22,342,233	18,750,104		17,314,204	1.61x	10.27%	12.00%	(1.73%)
2006	New York Fairview Private Equity Fund, L.P.	7/14/2006		19,000,000		17,320,307	14,983,489		8,375,306	1.35x	6.13%	9.09%	(2.96%)
2009	Mesirow Financial Private Equity Partnership Fund V, L.P.	3/7/2011		45,000,000		34,439,326	15,307,954		40,332,487	1.62x	15.82%	12.72%	3.10%
2012	Platinum Equity Capital Partners III, L.P.	1/14/2013		15,000,000		14,218,681	11,587,852		11,291,776	1.61x	49.79%	12.51%	37.29%
2012	Warburg Pincus Private Equity XI, L.P.	7/17/2012		25,000,000		22,190,787	4,438,890		24,853,969	1.32x	12.39%	11.33%	1.05%
2013	Apollo Investment Fund VIII, L.P.	12/11/2013		20,000,000		11,868,129	1,027,866		12,479,556	1.14x	11.93%	9.36%	2.57%
2013	Carlyle Partners VI, L.P.	7/3/2013		20,000,000		12,130,979	3,208,758		10,514,009	1.13x	8.03%	8.58%	(0.55%)
2013	Landmark Equity Partners XV, L.P.	10/30/2013		19,000,000		7,795,118	3,438,372		5,755,129	1.18x	11.27%	9.60%	1.67%
2013	Landmark Equity Partners XV, L.P Side Car	12/24/2013		6,000,000		3,043,236	1,177,388		2,698,437	1.27x	15.38%	6.68%	8.69%
2013	CVC Capital Partners VI, L.P.	2/18/2014		16,810,261		9,670,315	118,425		10,024,003	1.05x	4.95%	9.50%	(4.55%)
2013	Crestview Partners III, L.P.	3/3/2015		15,000,000		4,598,843	75,827		4,399,792	0.97x	(2.45%)	7.82%	(10.27%)
2013	Crestview Partners III (Co-Investment B), L.P.	12/17/2015		5,000,000		3,027,407	72,440		3,398,923	1.15x	24.90%	13.35%	11.55%
2014	ASF VI, L.P.	5/9/2014		15,000,000		8,325,263	805,679		9,542,170	1.24x	14.53%	8.93%	5.60%
2014	ASF VI NYC Co-Invest, L.P.	5/9/2014		5,000,000		3,313,934	966,516		3,325,766	1.30x	15.99%	5.88%	10.11%
2014	Carlyle Partners VI, L.P Side Car	9/23/2014		2,200,000		1,193,842	-		1,101,066	0.92x	(5.17%)	6.95%	(12.12%)
2014	Lexington Capital Partners VIII, L.P.	1/8/2015		20,000,000		5,134,814	1,631,596		5,083,318	1.31x	29.34%	10.58%	18.76%
2014	Vista Equity Partners Fund V, L.P.	9/8/2014		25,000,000		24,315,235	4,650,465		22,951,277	1.14x	9.75%	8.20%	1.55%
2015	Centerbridge Capital Partners III, L.P.	5/21/2015		2,500,000		681,731	30,128		762,721	1.16x	13.05%	8.82%	4.24%
2015	Siris Partners III, L.P.	5/4/2015		3,500,000		1,430,221	23,058		1,399,895	0.99x	(0.78%)	10.15%	(10.93%)
2012	NYCBERS - 2012 Emerging Manager Program*	10/31/2014		25,000,000		8,057,778	339,488		8,247,267	1.07x	N/A	N/A	N/A
2015	American Securities Partners VII, L.P.	7/8/2016		8,000,000		1,623,122	73,119		1,579,784	1.02x	7.02%	22.66%	(15.64%)
2015	ASF VII, L.P.	12/29/2015		10,000,000		935,000	80,842		1,000,558	1.16x	22.98%	11.61%	11.38%
2015	ASF VII B NYC Co-Invest, L.P.	12/29/2015		6,000,000		600	-		600	1.00x	N/A	N/A	N/A
2015	NYCBERS - 2015 Emerging Manager Program**	2/22/2016		30,000,000		769,896	9,786		755,005	0.99x	N/A	N/A	N/A
2015	Warburg Pincus Private Equity XII, L.P.	12/21/2015		21,500,000		3,859,250	23,326		3,514,231	0.92x	(21.19%)	17.17%	(38.36%)
2015	Welsh, Carson, Anderson & Stowe XII, L.P.	8/26/2015		10,000,000		2,815,523	-		3,208,158	1.14x	11.72%	13.84%	(2.12%)
2015	Bridgepoint Europe V, L.P.	2/8/2016		8,031,222		2,351,975	-		2,715,964	1.15x	21.24%	20.46%	0.78%
2015	Bridgepoint Europe V Co-Invest	8/16/2016		2,665,605		553,673	-		542,363	0.98x	(2.04%)	4.26%	(6.30%)
2015	EQT VII. L.P.	1/8/2016		16,114,782		5,496,731	30,712		4,953,695	0.91x	(18.80%)	16.68%	(35.48%)
2016	Vista Equity Partners Fund VI, L.P.	6/28/2016		16,000,000		5,701,461	48,231		5,637,912	1.00x	(0.40%)	10.80%	(11.20%)
2016	Apax IX USD, L.P.	N/A		13,000,000		-	-		-	N/A	N/A	N/A	N/A
2017	Ares Corporate Opportunities Fund V, L.P.	N/A		10,000,000		-	-		-	N/A	N/A	N/A	N/A
2017	Green Equity Investors VII, L.P.	N/A		10,000,000		-	-		-	N/A	N/A	N/A	N/A
2017	BC European Capital X, L.P.	N/A		10,536,298		-	-		-	N/A	N/A	N/A	N/A
2017	BC European Capital X Metro Co-Investment L.P.	N/A		4,214,519		-	-		-	N/A	N/A	N/A	N/A
Total Po			\$		\$	295,153,984	\$ 151,683,236	\$	251,875,241	1.37x	10.29%	9.75%	0.54%
Vintage Year	Investment	First Drawdown		Committed Capital	c	Net Contributed Capital	Net Distributed Capital		Market Value	Multiple	IRR <sup>1</sup>	PME Benchmark <sup>2</sup>	PME Spread <sup>3</sup>

Commitments Closed Subsequent to as of Date

Total Commitments Closed Subsequent to as of Date

\*Please note that the NYCBERS - 2012 Emerging Manager Program total commitment amount includes the full amount allocated to the Program, of which \$14.7 million has been committed as of December 31, 2016.

\*\*Please note that the NYCBERS - 2015 Emerging Manager Program total commitment amount includes the full amount allocated to the Program, of which \$7.5 million has been committed as of December 31, 2016.

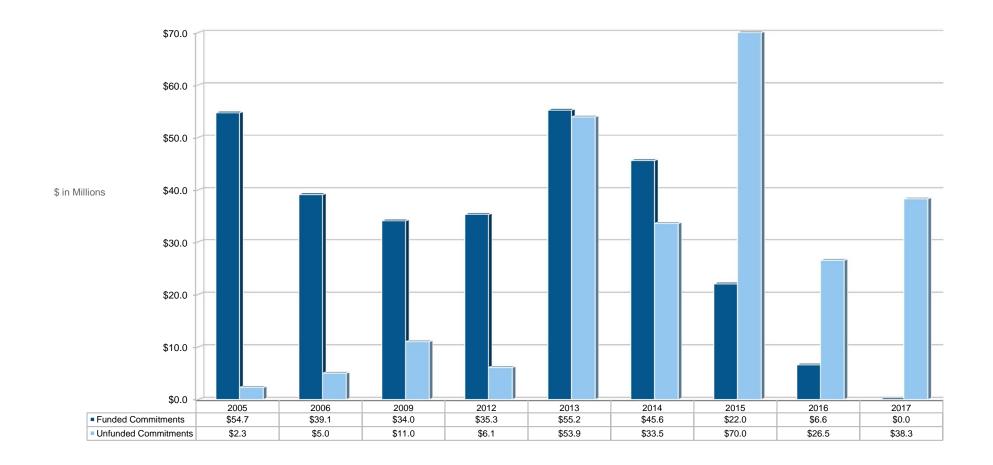
<sup>1</sup>Performance for funds with less than 8 quarters of activity is not yet meaningful.

<sup>2</sup> The total PME is the Russell 3000 Total Return Index and incorporates the PME + methodology for all partnerships where distributions have occurred, and incorporates the and incorporates the Long Nickel methodologies for those partnerships that have not yet had any distributions to date. The fund PME is the Russell 3000 Total Return Index and incorporates the PME + methodology for all partnerships where distributions have occurred.

<sup>3</sup>PME Spread is the percentage difference between the IRR and PME Benchmark for each respective partnership.

Note: Where available, December 31, 2016 reported valuations were used. In the absense of December 31, 2016 reported values, market values have been adjusted forward using interim cashflows through December 31, 2016. The IRR calculated in the early years of a fund is not meaningful given the j-curve effect. The aggregate portfolio performance figures for IRR and multiple are as of December 31, 2016.

#### NYC Board of Education Retirement System Commitments By Vintage Year As of December 31, 2016



Funded Commitments exclude additional fees. Unfunded Commitments include recallable returns of capital.

Fourth Quarter 2016 Report



# Section 3:

Funds-of-Funds Review

#### Mesirow Financial Private Equity Partnership Fund III, L.P.

#### **Fund Overview**

The Partnership, a 2005 vintage year Partnership, was formed on April 6, 2005 with the intent of investing capital in various private equity limited partnerships. As of December 31, 2016, the Partnership has invested in 43 underlying funds.

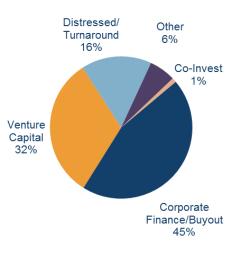
#### **Partnership Summary**

NYC Board of Education Retirement System committed \$57.0 million to the Mesirow Financial Private Equity Partnership Fund III, L.P. and as of December 31, 2016, has generated a 8.62% IRR and a Total Value Multiple of 1.66x from its investment. The Partnership is well diversified strategically.

PerformanceSummary							
\$ in millions	9/30/2016	12/31/2016	Change				
Capital Commitment	\$57.0	\$57.0	-				
Unfunded Commitment	\$2.3	\$2.3	-				
Capital Contributed	\$55.1	\$55.1	-				
Capital Distributed	\$65.6	\$68.4	\$2.8				
Market Value	\$26.5	\$22.9	(\$3.6)				
Total Value Multiple	1.67x	1.66x	(0.01x)				
Since Inception IRR	8.84%	8.62%	(22 bps)				

Time Horizon Performance							
6-Month IRR	1-Year IRR	3-Year IRR	5-Year IRR	Since Inception IRR			
0.39%	(2.16%)	9.79%	12.01%	8.62%			





\*Strategic exposure to 'Other' consists of underlying partnerships for which investment strategies are not disclosed in the quarter end financial statements.

#### **Performance Drivers**

When compared to global private equity funds of the same vintage, Mesirow Financial Private Equity Partnership Fund III, L.P. is underperforming the upper quartile benchmark<sup>1</sup> by 250 bps and is outperforming the median quartile benchmark<sup>1</sup> by 380 bps on a since inception basis, as of December 31, 2016.

Outperformance of the median quartile benchmark<sup>1</sup> is being driven by eight underlying funds, all of which are being held above a 2.0x total value multiple as of December 31, 2016. The eight funds represent roughly 21.4% of underlying commitments and 21.8% of underlying market value.

Underperformance when compared to the upper quartile benchmark<sup>1</sup> is being driven by four underlying funds, all of which are being held below a 1.0x total value multiple as of December 31, 2016. All four of the funds are North America focused. The four funds represent roughly 5.90% of underlying commitments and 3.52% of underlying market value.



#### Mesirow Financial Private Equity Partnership Fund IV, L.P.

#### **Fund Overview**

The Partnership, a 2006 vintage year Partnership, was formed on November 21, 2006 with the intent of investing capital in various private equity limited partnerships. As of December 31, 2016, the Partnership has invested in 46 underlying funds.

#### **Partnership Summary**

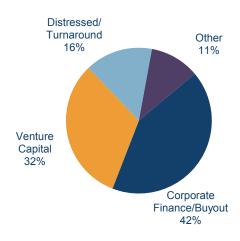
NYC Board of Education Retirement System committed \$25.0 million to the Mesirow Financial Private Equity Partnership Fund IV, L.P. and as of December 31, 2016, has generated a 10.27% IRR and a Total Value Multiple of 1.62x from its investment. The Partnership is well diversified strategically.

PerformanceSummary							
\$ in millions	9/30/2016	12/31/2016	Change				
Capital Commitment	\$25.0	\$25.0	-				
Unfunded Commitment	\$3.0	\$2.9	(\$0.1)				
Capital Contributed	\$22.2	\$22.3	\$0.1				
Capital Distributed	\$17.1	\$18.8	\$1.7				
Market Value	\$18.0	\$17.3	(\$0.7)				
Total Value Multiple	1.58x	1.62x	0.04x				
Since Inception IRR	10.06%	10.27%	8 bps				
Time	e Horizon Perform	ance					

**3-Year IRR** 

11.91%





\*Strategic exposure to 'Other' consists of underlying partnerships for which investment strategies are not disclosed in the quarter end financial statements.

5-Year IRR

13.91%

#### **Performance Drivers**

6-Month IRR

7.90%

1-Year IRR

10.13%

When compared to global private equity funds of the same vintage, Mesirow Financial Private Equity Partnership Fund IV, L.P. is underperforming the upper quartile benchmark<sup>1</sup> by 77 bps and is outperforming the median quartile benchmark<sup>1</sup> by 462 bps on a since inception basis, as of December 31, 2016.

Since Inception

10.27%

Outperformance of the median quartile benchmark<sup>1</sup> is being driven by twelve underlying funds, all of which are being held above a 2.0x total value multiple as of December 31, 2016. These twelve funds represent roughly 26% of underlying commitments and 21.3% of underlying market value.

Underperformance when compared to the upper quartile benchmark<sup>1</sup> is being driven by two underlying funds, which are being held at or below a 1.0x total value multiple as of December 31, 2016. The two funds represent roughly 3.4% of underlying commitments and 1.5% of underlying market value.

#### Mesirow Financial Private Equity Partnership Fund V, L.P.

#### **Fund Overview**

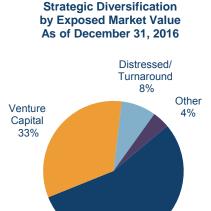
The Partnership, a 2009 vintage year Partnership, was formed on November 5, 2008 with the intent of investing capital in various private equity limited partnerships. As of December 31, 2016, the Partnership has invested in 54 underlying funds.

#### **Partnership Summary**

NYC Board of Education Retirement System committed \$45.0 million to the Mesirow Financial Private Equity Partnership Fund V, L.P. and as of December 31, 2016, has generated a 15.82% IRR and a Total Value Multiple of 1.62x from its investment. The Partnership is well diversified strategically.

PerformanceSummary					
\$ in millions	9/30/2016	12/31/2016	Change		
Capital Commitment	\$45.0	\$45.0	-		
Unfunded Commitment	\$11.9	\$11.0	(\$0.9)		
Capital Contributed	\$33.5	\$34.4	\$0.9		
Capital Distributed	\$11.7	\$15.3	\$3.6		
Market Value	\$41.1	\$40.3	(\$0.8)		
Total Value Multiple	1.57x	1.62x	0.05x		
Since Inception IRR	15.56%	15.82%	26 bps		

Time Horizon Performance				
6-Month IRR	1-Year IRR	3-Year IRR	5-Year IRR	Since Inception IRR
8.80%	13.48%	15.56%	16.51%	15.82%



Corporate Finance/Buyout 54%

\*Strategic exposure to 'Other' consists of underlying partnerships for which investment strategies are not disclosed in the quarter end financial statements.

#### **Performance Drivers**

When compared to global private equity funds of the same vintage, Mesirow Financial Private Equity Partnership Fund V, L.P. is underperforming the upper quartile benchmark<sup>1</sup> by 365 bps and outperforming the median quartile benchmark<sup>1</sup> by 364 bps on a since inception basis, as of December 31, 2016.

Outperformance of the median quartile benchmark<sup>1</sup> is being driven by ten underlying funds, all of which are being held above a 2.0x total value multiple as of December 31, 2016. These top drivers represent roughly 20.7% of underlying commitments and 26.8% of underlying market value.

Underperformance when compared to the upper quartile benchmark<sup>1</sup> is being driven by one underlying funds, all of which are being held at or below a 1.0x total value multiple as of December 31, 2016. The fund represents roughly 2.8% of underlying commitments and 2.5% of underlying market value.



# New York Fairview Private Equity Fund, L.P. Fund Overview

The Partnership, a 2006 vintage year Partnership, was formed on May 22, 2006 with the intent of investing in emerging private equity funds with aggregate capital commitments of no more than \$300 million. As of December 31, 2016, the Partnership has invested in 6 underlying funds.

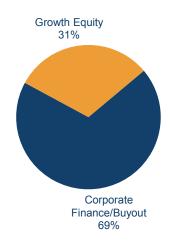
#### **Partnership Summary**

NYC Board of Education Retirement System committed \$19.0 million to the New York Fairview Private Equity Fund, L.P. and as of December 31, 2016 has generated a 6.13% IRR and a Total Value Multiple of 1.35x from its investment. The Partnership is heavily weighted towards Corporate Finance/Buyout, with roughly 69% of the underlying funds exposed market value attributable to this sector.

PerformanceSummary				
\$ in millions	9/30/2016	12/31/2016	Change	
Capital Commitment	\$19.0	\$19.0	-	
Unfunded Commitment	\$2.1	\$2.1	-	
Capital Contributed	\$17.3	\$17.3	-	
Capital Distributed	\$14.5	\$14.9	\$0.4	
Market Value	\$9.1	\$8.4	(\$0.7)	
Total Value Multiple	1.36x	1.35x	(0.01x)	
Since Inception IRR	6.39%	6.13%	(26 bps)	

Time Horizon Performance					
6-Month IRR	1-Year IRR	3-Year IRR	5-Year IRR	Since Inception IRR	
(5.52%)	(5.20%)	5.69%	9.71%	6.13%	





#### **Performance Drivers**

When compared to global private equity funds of the same vintage, New York Fairview Private Equity Fund, L.P. is underperforming the upper quartile benchmark<sup>1</sup> by 491 bps and outperforming the median quartile benchmark<sup>1</sup> by 48 bps, on a since inception basis, as of December 31, 2016.

Underlying fund performance has been mixed, with four funds performing well and being held above a 2.0x total value multiple, and one fund being held below a 1.0x total value multiple. The four remaining underlying funds are being held at or above 1.0x total value multiple as of December 31, 2016.



Fourth Quarter 2016 Report



# Appendix A: Glossary of Terms

## NYC Board of Education Retirement System Fourth Quarter 2016 Report

**Additional Fees:** The amount of capital an investor pays into a fund/investment that does not count against the investors' commitment. Additional fees typically consist of management fees or late-closing interest expense.

Capital Committed: An investor's financial obligation to provide a set amount of capital to the investment.

**Capital Contributed:** Capital contributed from an investor's capital commitment to fund partnership investments, organizational expenses and management fees.

Capital Distributed: Cash or stock disbursed to the investors of an investment.

**Co/Direct Investment:** A direct investment is a purchased interest of an operating company. A co-investment is a direct investment made alongside a partnership.

**Corporate Finance/Buyout:** Funds seeking to make controlling and non-controlling investments in established companies which have the potential to achieve greater value through improved performance.

**Cost Basis:** Capital contributions less return of principal.

Fund-of-Funds: An investment vehicle which invests in other private equity partnerships.

Fund/Investment Size: The total amount of capital committed by investors to a fund.

**Investment Category:** Used to identify investments in one of the following categories: co/direct investments, fund-of-funds, primary funds, secondary fund-of-funds or secondary purchases.

**Investment Strategy:** A sub-classification of a partnership's investment type, such as Co/Direct Investment, Corporate Finance/Buyout, Mezzanine, Real Estate, Special Situation, Venture Capital.

Life Cycle Period: The current stage of a partnership depending on the percentage contributed to date. Life cycle periods are investment and realization.

**Mezzanine:** An investment strategy involving the purchase of subordinated debt. These securities exist between the senior debt and equity of a holding's capital structure. Subordinated debt carries a lower level of risk than pure equity structures because they generate current income and have a more senior position in the company's capital structure.

**Net Internal Rate Of Return ("IRR"):** The discount rate that equates the net present value of the partnership's cash outflows with its inflows and residual value at the time of calculation. The calculation is net of management fees and the general partner's carried interest.

**Originator:** The institution responsible for recommending a client commit to an investment.

**Ownership Percentage:** The investor's percent of ownership as measured by capital committed divided by fund/investment size.

**Paid-In Capital:** The amount of capital an investor has contributed to a partnership, which includes capital contributions and additional fees.

**Pooled Average IRR:** An IRR calculation which aggregates cash flows (paid-in capital and capital distributed) and the reported market values of each investment within a portfolio to create one portfolio investment and return.



## **NYC Board of Education Retirement System** Fourth Quarter 2016 Report

**Portfolio Holding Exposure:** The limited partner's pro rata allocation to an underlying investment based on the ownership percentage of the partnership.

**Primary Fund:** Defines when the investor acquired an interest in the partnership. Primary fund is the investment category when an investor participates in a closing at the inception of the partnership.

**Private Equity Partnership:** A professionally managed pool of capital that generally invests in unlisted companies or securities. Common investment strategies include corporate finance/buyout, mezzanine, special situations and venture capital.

Realized Multiple: Ratio of cumulative distributions to paid-in capital.

**Return On Investment ("ROI"):** A calculation based on the total value (market value plus distributions) divided by paid-in capital for an investment.

**Reported Market Value:** The investment's capital account balance at quarter end, which includes the general partner's reported value of the underlying holdings and other assets and liabilities.

**Secondary Fund-of-Funds:** A private equity vehicle formed to purchase active partnership interests from an investor.

**Secondary Purchase:** A purchase of an existing partnership interest or pool of partnership interests from an investor.

**Special Situation:** Partnerships that invest using a unique strategy. Examples include distressed and turnaround, industry focused and multi-stage partnerships.

**Total Exposure:** Calculated by the summation of market value and unfunded commitments.

**Venture Capital:** An investment strategy that provides start-up or growth capital to companies in the early stages of development. Venture investments generally involve a greater degree of risk, but have the potential for higher returns.

Vintage Year: The year in which a partnership makes its first capital call for an investment into a portfolio company/holding.

Fourth Quarter 2016 Report



# Appendix B:

**Disclosure Statement** 

Non-public information contained in this report is confidential and intended solely for dissemination to NYC Board of Education Retirement System and/or its Affiliates. Hamilton Lane has prepared this report to enable NYC Board of Education Retirement System and/or its Affiliates to assess the performance and status of its alternative investment portfolio. The calculations contained in this document are made by Hamilton Lane based on information provided by the general partner (e.g. cash flows and valuations), and have not been prepared, reviewed or approved by the general partners. Hamilton Lane hereby disclaims any liability resulting from any unauthorized dissemination of the attached information.

The information contained in this report may include forward-looking statements regarding the funds presented or their portfolio companies. Forward-looking statements include a number of risks, uncertainties and other factors beyond the control of the funds or the portfolio companies, which may result in material differences in actual results, performance or other expectations. The information presented is not a complete analysis of every material fact concerning each fund or each company. The opinions, estimates and analyses reflect our current judgment, which may change in the future.

All opinions, estimates and forecasts of future performance or other events contained herein are based on information available to Hamilton Lane as of the date of this presentation and are subject to change. Past performance of the investments described herein is not indicative of future results. Certain of the information included in this presentation has not been reviewed or audited by independent public accountants. Certain information included herein has been obtained from sources that Hamilton Lane believes to be reliable but the accuracy of such information cannot be guaranteed.

The past performance information contained in this report is not necessarily indicative of future results and there is no assurance that the funds will achieve comparable results or that they will be able to implement their investment strategy or achieve their investment objectives. The actual realized value of currently unrealized investments will depend on a variety of factors, including future operating results, the value of the assets and market conditions at the time of disposition, any related transaction costs and the timing and manner of sale, all of which may differ from the assumptions and circumstances on which the current unrealized valuations are based.

Any tables, graphs or charts relating to past performance included in this report are intended only to illustrate the performance of the funds or the portfolio companies referred to for the historical periods shown. Such tables, graphs and charts are not intended to predict future performance and should not be used as the basis for an investment decision.

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# Real Assets Quarterly Report a/o December 31, 2016:

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**OVERVIEW** 

Executive Summary: Fourth Quarter 2016 Performance Measurement Report Real Estate

#### **Portfolio Profile**

The New York City Board of Education Retirement System has allocated 9.0% of the total plan to Real Estate. The Real Estate Portfolio's objective is to generate a total net return that exceeds the NFI-ODCE +100 bps total net return measured over full market cycles.

#### Portfolio Statistics (December 31, 2016)

1 Year Time Weighted Net Return:

3 Year Time Weighted Net Return: Inception-to-Date (ITD) Time-Weighted:

**ITD Net IRR:** 

Style Sector:

Benchmark

Leverage

**ITD Net Equity Multiple:** 

**Investment Guidelines** 

**Region Diversification** 

**Investment Diversification** 

Manager Diversification

Total Plan Assets	\$4.8 billion
Target Real Estate Allocation (%)	9%
Target Real Estate Allocation (\$)	\$434.9 million
Total Real Estate Market Value	\$278.1 million
Real Estate Unfunded Commitments	\$146.6 million
Total Real Estate Exposure	\$424.8 million
Number of Investments	24
Number of Managers	21
Net Returns (as of December 31, 2016)	
4Q16 Time-Weighted Net Return:	3.6%

#### Global investment activity totaled \$661 billion in 2016, -6% below a strong 2015. Commercial real estate investment dropped -2% y/y in the last quarter compared to 4Q15. Compared to 2015, GDP increased 1.6% during 2016. The only positive contributing private sector, consumer spending added 1.84% to annual growth, offset by -0.26% and -0.12% subtractions from business investment and trade, respectively. Business investment, while lackluster in 2016, has seen a positive start to 2017. Macro indicators for U.S. real estate remained moderate and consistent during 2016. U.S. cities have dominated as real estate investment targets in 2016. New York and Los Angeles (1<sup>st</sup> and 3<sup>rd</sup> respectively) featuring in the top five. Of note is Shanghai coming in at 5<sup>th</sup> globally off the back of a record 2016. Transaction cap rates compressed moderately over 2016 across major sectors. Multifamily experienced a 9 bps compression while Retail saw the largest 12-month change in cap rates (-37 bps). The Industrial and Office sectors logged 22 bps and 26 bps of <sup>n</sup> cap rate compression over 2016, respectively.

#### Direct Commercial Real Estate Investment - Regional Volumes, 2015 - 2016

								% Change
			% Change		% Change			YTD 2015 -
US Billions	Q3 16	Q4 16	Q3 16 - Q4 16	Q4 15	Q4 15 - Q4 16	2015	2016	YTD 2016
mericas	77	78	1%	85	-8%	314	285	-9%
ИEA	55	85	55%	90	-6%	267	246	-8%
sia Pacific	33	43	30%	36	19%	123	130	6%
otal	165	206	25%	211	-2%	704	661	-6%
	nericas IEA ia Pacific	nericas 77 IEA 55 ia Pacific 33	nericas 77 78 IEA 55 85 ia Pacific 33 43	US Billions         Q3 16         Q4 16         Q3 16 - Q4 16           nericas         77         78         1%           IEA         55         85         55%           ia Pacific         33         43         30%	US Billions         Q3 16         Q4 16         Q3 16-Q4 16         Q4 15           nericas         77         78         1%         85           IEA         55         85         55%         90           ia Pacific         33         43         30%         36	US Billions         Q3 16         Q4 16         Q3 16 - Q4 16         Q4 15         Q4 15 - Q4 16           nericas         77         78         1%         85         -8%           IEA         55         85         55%         90         -6%           ia Pacific         33         43         30%         36         19%	US Billions         Q3 16         Q4 16         Q3 16-Q4 16         Q4 15         Q4 15-Q4 16         2015           nericas         77         78         1%         85         -8%         314           IEA         55         85         55%         90         -6%         267           ia Pacific         33         43         30%         36         19%         123	US Billions         Q3 16         Q4 16         Q3 16 - Q4 16         Q4 15         Q4 15 - Q4 16         2015         2016           nericas         77         78         1%         85         -8%         314         285           IEA         55         85         55%         90         -6%         267         246           ia Pacific         33         43         30%         36         19%         123         130

13.4% Source: Jones Lang LaSalle, January 2017

#### 9.6%

65%

11.5

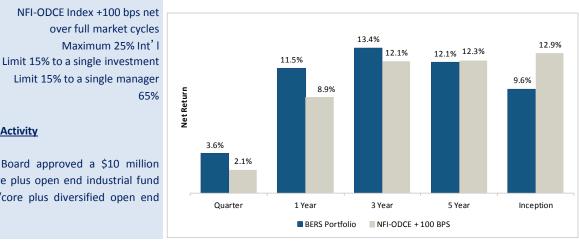
Target •5.0% Core/Core Plus

•4.0% Non-Core

Limit 15% to a single manager

Maximum 25% Int' I

The New York City Board of Education Retirement System ("NYCBERS") Real Estate 12.2% Portfolio is well positioned to take advantage of conditions in the real estate 1.3x marketplace and has been an active investor in the most recent vintage years. At the end of the Fourth Quarter 2016, the Portfolio achieved a total gross return of 4.4% which was comprised of 1.8% income and 2.6% appreciation. The net return for the Quarter was 3.6%. A detailed analysis of the Portfolios real estate performance is found later in this Executive Summary.



#### Fourth Quarter Investment Activity

During the Quarter, the Board approved a \$10 million commitment to a core/core plus open end industrial fund and \$10 million to a core/core plus diversified open end fund.

#### Fourth Quarter 2016

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Executive Summary: Fourth Quarter 2016 Performance Measurement Report Real Estate

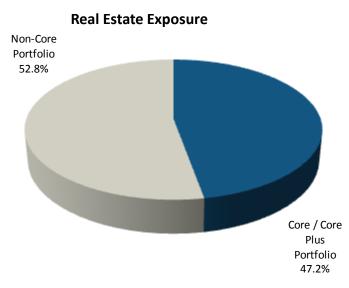
#### FUNDING AND COMPOSITION

At the end of the Fourth Quarter, the Portfolio was funded at \$278.1 million, or 5.8% of total plan assets. A total of \$146.6 million in unfunded commitments are still outstanding. Unfunded commitments are up from \$132.0 million as of Third Quarter 2016.

New contributions for the Quarter totaled \$20.5 million, offset by \$10.7 million in distributions and withdrawals. Distributions were weighted to the Non-Core sector.

Shown in the pie chart to the right is the current risk sector exposure calculated by Market Value + Unfunded Commitments. The Core/ Core Plus component accounts for 47.2% of the Portfolio exposure during the Quarter. The Non-Core component accounts for 52.8% of the Portfolio exposure.

A more detailed break-down of the Portfolio Composition is shown in the table below. Attached as Exhibit A is a matrix which demonstrates compliance with various Investment Policy Statement guidelines.



New York City	Board of Education Retirement System	
Total Plan Assets	12/31/2016	4,832
Real Estate Allocation (%)		9.0
Real Estate Allocation (\$)		435
Real Estate Core Allocation (%)		5.0
Real Estate Core Allocation (\$)		242
Real Estate Non-Core Allocation (%)		4.0
Real Estate Non-Core Allocation (\$)		193
	Style Sector Allocation	
Funded (Market Value) Core/Core Plus Portfolio		167
Funded (Market Value) Non-Core Portfolio		111
Unfunded Core / Core Plus Portfolio	34	
Unfunded Non-Core Portfolio		113
Funded (Ma	rket Value) and Committed Statistics	
Core / Core Plus Portfolio		47.2
Non-Core Portfolio	52.8	
Core/Core Plus Committed	200	
Non-Core Committed	224	
\$ Committed		425
% Committed on Real Estate Allocation		97.7
% Committed on Total Plan Assets		8.8
Fun	ded (Market Value) Statistics	
% Core/Core Plus Funded (Market Value) of Total	Plan Assets	3.5
% Non-Core Funded (Market Value) of Total Plan	Assets	2.3
% Funded (Market Value) of Total Plan Assets		5.8
% Funded (Market Value) of Total Real Estate All	ocation	64.0

# The New York City Board of Education Retiren Page 437 of 541 m

Executive Summary: Fourth Quarter 2016 Performance Measurement Report Real Estate

#### PERFORMANCE

During the Quarter under review, the NYCBERS Real Estate Portfolio produced a 4.4% total gross return. The total net return for the Quarter was 3.6%. On a rolling one-year basis the total gross return of 14.0% was recorded. On a net basis the total return was 11.5%. The benchmark return contemplates a 100 bps premium over the ODCE net return over full market cycles. This benchmark is not meaningful at this point in time as the NYCBERS Portfolio is in its infancy. The various components of the Portfolio returns are depicted in the chart below.

#### Core/Core Plus

As of December 31, 2016 the market value of the Core/ Core Plus Portfolio was \$166.8 million, or 60.0% on an invested basis. On a funded and committed basis, the Core/ Core Plus Portfolio totaled \$200.3 million, or 47.2% of the total Portfolio. The Core/ Core plus Portfolio generated a 3.1% total gross return for the Quarter comprised of 1.0% in income and 2.0% in appreciation. The total net return for the Quarter was 2.6%.

The most significant contributor to the Quarterly return for the Core/Core Plus Portfolio was NYC Asset Investor #2 (Related), which added 0.4% to the total return. The largest detractor from the Core/Core Plus Portfolio was UBS Trumbull Property Fund, which detracted (1.2)% from the total net return.

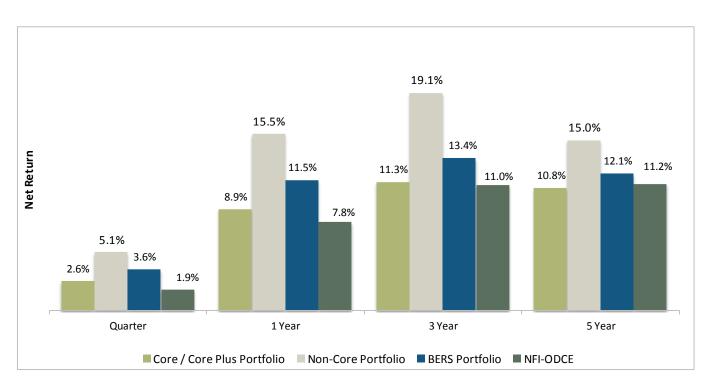
The Core/Core Plus Portfolio achieved a 8.9% net return over the one-year period ending December 31, 2016 and has achieved a 11.0% net return since the inception of the Core/ Core Plus Portfolio in 2011.

#### Non-Core

As of December 31, 2016 the market value of the Non-Core Portfolio was \$111.4 million, or 40.0% on an invested basis. On a funded and committed basis, the Non-Core Portfolio totaled \$224.4 million, or 52.8% of the total Portfolio. The Non-Core Portfolio generated a 6.4% total gross return for the Quarter comprised of 2.9% in income and 3.5% in appreciation. The total net return for the Quarter was 5.1%.

Of the 14 Non-Core Funds that contributed to the Quarterly return, Franklin Templeton Private Real Estate Fund contributed the most, adding 3.7%. Blackstone Real Estate Partners Europe IV was the largest detractor for the Quarter, taking away (2.3)% from the overall performance of the Non-Core Portfolio.

The Non-Core Portfolio achieved an 15.5% net return over the one-year period ending December 31, 2016 and has achieved an 12.1% net return since the inception of the Non-Core Portfolio in 2011.



The New York City Board of Education Retirement System

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Executive Summary: Fourth Quarter 2016 Performance Measurement Report Real Estate

#### PERFORMANCE

#### Portfolio Performance

At the end of the Fourth Quarter 2016, the Portfolio had a cumulative market value of \$278.1 million. Total market value plus unfunded commitments was \$424.8 million, or 97.7% of the real estate allocation. During the Quarter, the Portfolio achieved a total gross return of 4.4% which was comprised of 1.8% income and 2.6% appreciation. The Portfolio achieved a total net return of 3.6%. Since inception, the Portfolio has a net IRR of 12.2% and an equity multiple of 1.3x as of December 31, 2016. Note, attached as Exhibit B are performance metrics relating to each investment within the Portfolio.

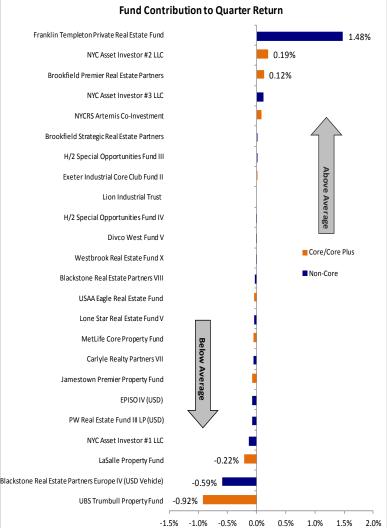
The Quarterly return was driven by Franklin Templeton Private Real Estate Fund, which contributed 1.5% to the overall performance. The primary laggard in the Portfolio was UBS Trumbull Property Fund, which detracted (0.9%). Brief reviews of the Funds in the Portfolio are found below. Note, that attached as Exhibit C is a chart relating to fund contributions to returns over the one-year period.

#### Franklin Templeton Private Real Estate Fund.

The Fund's total gross return for the Quarter was 27.8% comprised of 15.3% in income and 012.5% in appreciation. The net return after fees was 27.7%. The Fund consists of nine funds and five direct investments. Eleven of the fourteen portfolio investments made distributions subsequent to Fourth Quarterend totaling \$14.4 million. Total distributions since inception total \$333.1 million or 101.5% of Fund equity. Through the end of 1Q 2017, \$328.1 million of total Fund commitments had been called with \$61.8 million unfunded. The Fund's investment in the Savanna II has been fully realized with the sponsor anticipating a final distribution during 3Q 2017. Several underlying investments are in the asset disposition process.

#### NYC Asset Investor #2 (Related).

The Fund produced a 10.5% total gross return, comprised of 0.4% in income and 10.1% in appreciation. The net return after fees was 8.1%. To date, the Fund has called \$290.0 million, or 94% of total commitments. During the Quarter, the Fund closed on the acquisition of a portfolio of 48 rent regulated units across four buildings located in Prospect Heights, Brooklyn, New York. Total acquisition price was \$31.1 million or \$648 a unit, comprising \$14.1 in Fund equity.



#### NYC Asset Investor #3 (Hudson).

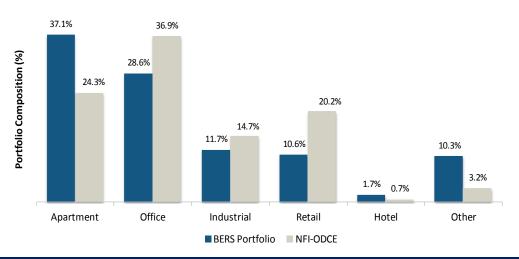
The Fund's total gross return for the Fourth Quarter was 13.3%, comprised of (0.2)% in income and 13.4% in appreciation. The net return after fees was 13.0%. As of year-end 2016, the Fund consisted of two operating assets, one development asset, and two assets in preconstruction. The Fund's investment period has ended. Subsequent to 4Q 2016, Hudson sold a property located in Brighton Beach, Brooklyn which closed on March 16, 2017.

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Executive Summary: Fourth Quarter 2016 Performance Measurement Report Real Estate

#### **PROPERTY TYPE DIVERSIFICATION**

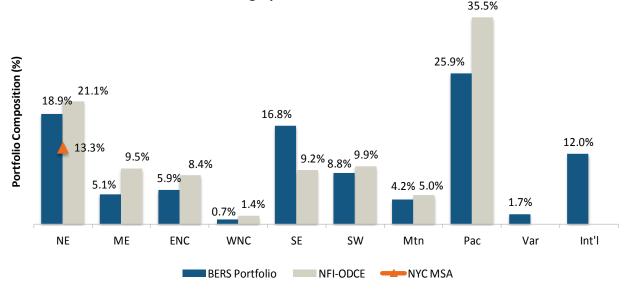
The diversification of the current Portfolio by property type is shown below and compared to the diversification of the NCREIF-ODCE at the end of the Quarter. Relative to the ODCE, the Portfolio is underweight to office, industrial, and retail. The Portfolio is overweight to apartment, hotel, and other property types which includes debt-related investments and can include other investments within diversified funds such as for sale residential, self storage, land, data centers, senior living, healthcare, medical office and student housing.



#### **Property Type Diversification**

#### **GEOGRAPHIC DIVERSIFICATION**

The diversification of the current funded Portfolio by geographic region is shown below and compared to the diversification of the NFI-ODCE at the end of the Quarter. The ODCE is a US-only index. The domestic portion of the Portfolio is well diversified relative to the ODCE with a slight overweight to the Northeast. The 12.0% international exposure is appropriate for the risk and return profile of NYCBERS and consistent with the long-term target.



#### **Geographic Diversification**

The New York City Board of Education Retirement System

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Executive Summary: Fourth Quarter 2016 Performance Measurement Report Real Estate

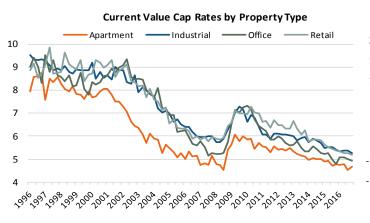
#### MARKET UPDATE

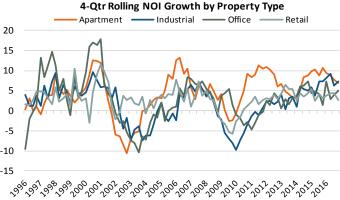
#### <u>General</u>

- Economic activity decelerated during the Fourth Quarter of 2016 to end the year at an annual rate of 1.9%, compared to 3.5% in the previous quarter. Compared to 2015, GDP increased 1.6% in 2016. The only positive contributing private sector, consumer spending added 1.84% to annual growth, offset by -0.26% and -0.12% subtractions from business investment and trade respectively. Business investment, while lackluster in 2016, has seen a positive start to 2017.
- Macro indicators for U.S. real estate remained moderate and consistent during 2016. Non residential construction increased at the same rate as in 2015 (+8% y/y) while residential housing starts declined (-1% y/y). Building permits, which signal future construction activity, inched a bit during the fourth quarter but essentially remained flat during the year.

#### **Commercial Real Estate**

- 2016 saw \$285 billion in U.S. commercial real estate transaction volume. This represents 43% of global investment and a 9% decline over 2015. JLL estimates global fundraising slowed in 2016 by -2.7% y/y, with \$245 billion in dry powder globally, \$133 billion of which is North America focused.
- CMBS issuances totaled \$25.9 billion in 4Q16. Full year (\$75.8 bn) issuances were down 25% over 2015 levels (\$101 bn). The credit environment in 2016 was cautious, with demand waning and supply remaining tight, reflecting a variety of risks: market cycle and to a lesser extent regulatory. The Fed's survey of senior loan officers showed credit standards especially tight for multifamily and development loans, indicating credit selectivity.
- U.S. cities have dominated as real estate investment targets in 2016. New York and Los Angeles (1st and 3rd respectively) featuring in the top five. Of note is Shanghai coming in at 5th globally off the back of a record 2016.
- Transaction cap rates compressed moderately over 2016 across major sectors. Multifamily experienced a 9 bps compression while Retail saw the largest 12-month change in cap rates (-37 bps). The Industrial and Office sectors logged 22 bps and 26 bps of cap rate compression over 2016, respectively.





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Executive Summary: Fourth Quarter 2016 Performance Measurement Report Real Estate

#### **EXHIBIT A: COMPLIANCE MATRIX**

Category	Requirement	Portfolio Status
Benchmark	NFI-ODCE (net) +100 bps over full market cycles	Portfolio returns outperform the benchmark over the quarter, one, and three-year time periods.
	Core/Core Plus (5% of RE Allocation)	The portfolio is funded (market value) and committed at 97.7% of real estate allocation with a portfolio composition of
Portfolio Composition	Non Core (4% of RE Allocation)	47.2% core/core plus and 52.8% non-core. Based on market value, the core/core plus portfolio is funded at 60.0% and the non- core portfolio is funded at 40.0%.
Real Estate Allocation	Target of 9.0%	Funded (market value) and committed dollars place the portfolio at 8.8 % of total
	Currently Funded at 5.8%	plan assets.
Property Type Diversification	Up to 40% Multifamily Up to 35% Industrial Up to 45% Office Up to 35% Retail Up to 25% Hotel Up to 20% Other	All property type locations are in compliance.
Geographic Diversification	Diversified geographically Max 25% Ex-US	All geographic type locations are in compliance
LTV	65%	Portfolio is in early stages of funding, but is in compliance (38.5 %).
Manager Exposure	15% of real estate allocation	N/A

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### **EXHIBIT B: FOURTH QUARTER 2016 FOIL**



#### OWNSENDGROUP

New York City Board of Education Retirement Syste	m
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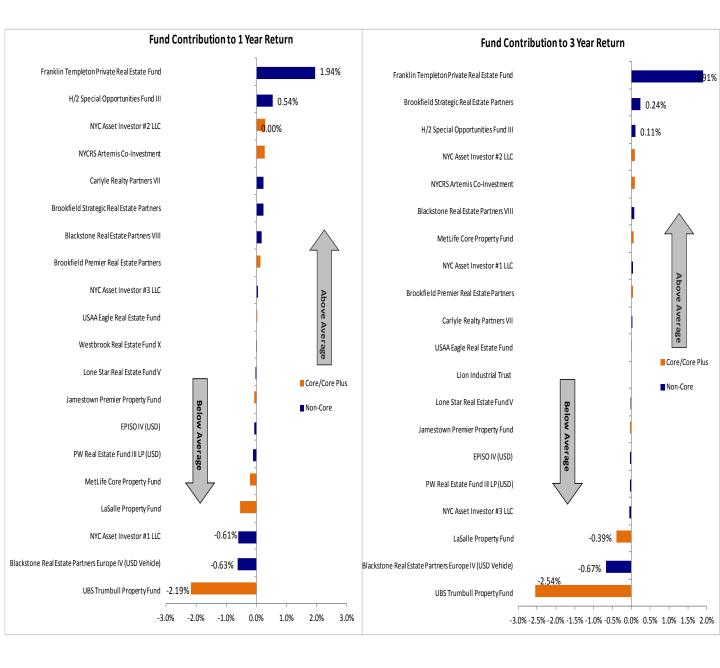
Vintage Year	Fund Name	First Draw Down	Capital Committed	Contributions	Distributions	Market Value	Equity Multiple	Net IRR
2017 E	Brookfield Premier Real Estate Partners	11/22/2016	10,000,000	4,715,030	0	5,114,482		
2016 E	Exeter Industrial Core Club Fund II	5/20/2016	10,000,000	2,450,000	-52,105	2,522,006	1.1	11.5
2016 J	lamestown Premier Property Fund	2/4/2016	5,000,000	5,137,182	-455,236	4,846,808	1.0	5.6
2011 L	LaSalle Property Fund	12/13/2010	27,600,000	27,600,000	-5,974,476	37,370,826	1.6	12.1
2017 L	Lion Industrial Trust - 2007		10,000,000	0	0	0		
2014	MetLife Core Property Fund	7/1/2014	15,000,000	15,000,000	-1,401,833	17,514,179	1.3	13.8
2013	NYC Asset Investor #2 LLC	7/9/2013	11,000,000	10,557,373	-1,450,644	12,307,842	1.3	16.0
2016	NYCRS Artemis Co-Investment	2/24/2016	11,000,000	3,253,838	0	4,022,526	1.2	64.6
2011 U	UBS Trumbull Property Fund	4/1/2011	41,400,000	56,822,909	-12,426,383	74,535,993	1.5	9.7
2016 U	USAA Eagle Real Estate Fund	12/1/2015	10,000,000	7,735,162	0	8,527,372	1.1	12.1
(	Core/Core Plus Portfolio		151,000,000	133,271,494	-21,760,676	166,762,035	1.4	10.9
2014 E	Blackstone Real Estate Partners Europe IV (USD Vehicle)	12/23/2013	32,500,000	28,920,153	-4,955,728	26,852,493	1.1	6.0
2015 E	Blackstone Real Estate Partners VIII	8/18/2015	16,500,000	7,132,514	-1,788,214	6,516,204	1.2	19.3
2012 E	Brookfield Strategic Real Estate Partners	9/20/2012	10,000,000	10,634,866	-3,797,149	11,721,425	1.5	17.6
2014 0	Carlyle Realty Partners VII	6/30/2014	25,000,000	14,176,644	-191,787	15,926,242	1.1	13.8
2016 [	Divco West Fund V	12/21/2016	10,000,000	522,271	0	467,330		
2016 E	European Property Investors Special Opportunities IV (EPISO IV)	12/18/2015	11,176,931	2,004,474	-272,080	1,656,507	1.0	-6.3
2011 F	Franklin Templeton Private Real Estate Fund	3/31/2011	30,000,000	30,330,456	-30,847,557	14,233,652	1.5	24.9
2015 H	H/2 Special Opportunities Fund III	12/29/2014	15,000,000	12,993,856	-844,314	14,262,659	1.2	19.1
2017 H	H/2 Special Opportunities Fund IV	11/15/2016	10,000,000	860,955	0	870,571	1.0	11.8
2017 L	Lone Star Real Estate Fund V		23,100,000	0	0	-259,485		
2013	NYC Asset Investor #1 LLC	6/25/2013	10,000,000	10,746,128	-1,395,024	12,112,842	1.3	12.7
2013	NYC Asset Investor #3 LLC	9/20/2013	8,000,000	3,335,361	-31,308	3,792,367	1.1	9.1
2016 F	PW Real Estate Fund III LP	10/7/2016	10,624,734	2,322,022	0	2,047,672	0.9	-41.7
2016	Westbrook Real Estate Fund X	7/18/2016	10,000,000	1,159,007	0	1,173,623	1.0	5.6
1	Non-Core Portfolio		221,901,665	125,138,706	-44,123,160	111,374,103	1.2	16.0
S	Small Emerging Manager		11,000,000	3,253,838	0	4,022,526	1.2	64.6
r	New York City Board of Education Retirement System		372,901,665	258,410,200	-65,883,835	278,136,137	1.3	12.2

Note: The equity multiples and IRRs contained in this report are interim calculations based upon information provided by the investment managers of the New York City Retirement Systems, including cash flows and quarterly unaudited, or audited, valuations. The IRR calculated in early years of a fund life is not meaningful given the J-curve effect and can be significantly impacted by the timing of cash flows, investment strategy, investment pacing, and fund life. The calculations are not necessarily indicative of total fund performance, which can only be determined after the fund is liquidated and all capital contributed and earnings have been distributed to the investor. All data supplied is as of December 31, 2016.

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Executive Summary: Fourth Quarter 2016 Performance Measurement Report Real Estate

#### **EXHIBIT C : ATTRIBUTION**





# Infrastructure Monitoring Report

For the period ended December 31, 2016

Report Prepared For:

New York City Board of Education Retirement System





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	Quarterly Highlights         Performance by Vintage Year         Performance by Strategy and Industry Focus         Performance by Geographic Focus         Portfolio Diversification         By Strategy, Geography and Industry Focus         By Investment Manager         Portfolio Cash Flow Analysis         Quarterly Cash Flow Activity         Annual Cash Flow Activity         Net Funded and Unfunded Commitments by Vintage Year         Portfolio Company-Level Analysis         Geographic Exposure and Performance	
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IV.	Risk Management Matrix	



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# I. Executive Summary

New York City Board of Education Retirement System ("NYC BERS") established the Infrastructure Program (the "Program") in December of 2012 on behalf of its beneficiaries to participate in attractive long-term investment opportunities and to provide diversification to its overall pension investment portfolio.

The inclusion of infrastructure in the NYC BERS pension portfolio allows for global investments in facilities or assets that provide core essential services critical to the operation and development of economies. Typically infrastructure investments have high barriers to entry due to significant capital expenditure requirements, exclusive long term contracts or regulatory requirements. Infrastructure investments are comprised of long useful-life assets with high tangible value and relatively low value erosion over time.

The Program seeks to invest in opportunities in a variety of infrastructure sectors, including but not limited to, transportation, energy, power, utilities, water, wastewater, communications and social infrastructure.

StepStone Group LP ("StepStone") was engaged by NYC BERS on October 20, 2014 to provide infrastructure advisory services for prospective investment opportunities and monitoring and reporting services for existing and new investments.

Since inception through December 31, 2016, the Program has committed US\$91.6 million to seven partnership investments (the "Portfolio"). This quarterly monitoring report covers the performance of the Portfolio as of December 31, 2016 as well as significant activity that occurred during the fourth quarter of 2016.

### **Allocation Summary**

NYC BERS has an Infrastructure allocation target of 4% of total pension assets. As of December 31, 2016, the market value of NYC BERS Infrastructure Program represented approximately 0.8% of total pension assets, a six basis point increase from the prior quarter.

As the Program matures, the percentage of its market value relative to the total NYC BERS pension assets will continue to increase.

US\$ in millions *	December 31, 2016	September 30, 2016	December 31, 2015	Quarterly Change	Yearly Change
Total Pension Assets	\$4,832.0	\$4,726.0	\$4,303.0	\$106.0	\$529.0
Total Infrastructure Assets	\$40.7	\$37.1	\$25.3	\$3.6	\$15.4
% Allocation to Infrastructure (Target of 4%)	0.8%	0.8%	0.6%	+ 6 bps	+ 25 bps

\*NYC BERS total Pension Assets are as of quarter-end (or, if not yet available, the most recent month-end prior to quarter-end) as reported by The New York City Comptroller's Office on www.comptroller.nyc.gov



### **Performance Summary**

As of December 31, 2016, the Infrastructure Program has achieved a Total Value to Paid-In multiple of 1.1x invested capital and an IRR of 9.1%. Note that, given the relative immaturity of the Portfolio and underlying fund investments, the current performance to-date is not meaningful.

US\$ in millions •	December 31, 2016	September 30, 2016	December 31, 2015	Quarterly Change	Yearly Change
Number of Managers	6	5	4	1	2
Number of Investments	7	6	4	1	3
Committed Capital <sup>1</sup>	\$91.6	\$81.0	\$59.0	\$10.6	\$32.6
Contributed Capital	\$38.2	\$35.1	\$24.6	\$3.1	\$13.7
Distributed Capital	\$1.8	\$1.4	\$0.7	\$0.5	\$1.1
Market Value	\$40.7	\$37.1	\$25.3	\$3.6	\$15.4
Total Value	\$42.5	\$38.5	\$26.0	\$4.1	\$16.5
Total Gain/(Loss)	\$4.3	\$3.4	\$1.4	\$0.9	\$2.9
Unfunded Commitment	\$54.8	\$46.9	\$34.7	\$7.9	\$20.1
Exposure <sup>2</sup>	\$95.5	\$84.0	\$60.0	\$11.5	\$35.5
DPI <sup>3</sup>	0.0x	0.0x	0.0x	0.0x	0.0x
TVPI <sup>4</sup>	1.11x	1.10x	1.06x	0.01x	0.05x
IRR <sup>5</sup>	9.1%	8.8%	8.4%	0.2%	0.7%
TVPI Net of StepStone Fees <sup>6</sup>	1.11x	1.09x	1.06x	0.02x	0.05x
IRR Net of StepStone Fees <sup>6</sup>	9.0%	8.8%	8.4%	0.2%	0.6%

\* Note that amounts may not total due to rounding. Past performance is not necessarily indicative of future results.

<sup>1</sup> Committed Capital is presented net of any commitment releases or expirations and reflects foreign currency exchange rate fluctuations. Note that the Base/(US\$) committed capital for foreign currency-denominated investments as of respective quarter-end dates is calculated as follows: (total net amount funded in Base currency) + (unfunded commitment in Local currency \* quarter-end exchange rate). StepStone utilizes S&P Capital IQ as the source for quarter-end exchange rates to calculate committed capital. <sup>2</sup> Exposure represents the sum of Market Value and Unfunded Commitment.

<sup>3</sup> DPI, or Distributed to Paid-In Multiple, is a performance metric that measures distributions received relative to capital invested. DPI is calculated as Distributed Capital divided by Contributed Capital.

<sup>4</sup> TVPI, or Total Value to Paid-In Multiple, is a performance metric that measures total value created by the Portfolio relative to capital invested, without consideration for time. TVPI is calculated as Total Value, which is comprised of Market Value plus Distributed Capital, divided by Contributed Capital.

<sup>5</sup> IRR, or Internal Rate of Return, is a performance metric that is calculated based on the Portfolio's daily cash flows and market value as of quarter-end. IRR is net of fund managers' fees, expenses and carried interest.

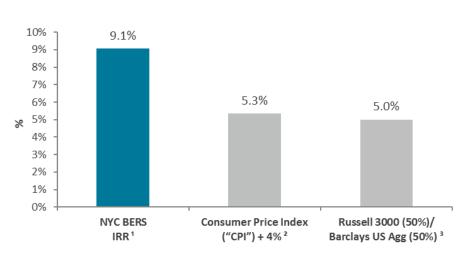
<sup>6</sup>TVPI and IRR Net of StepStone fees represent TVPI and IRR net of fees paid by NYC BERS to StepStone through the quarter-end date.



### Portfolio Performance vs. Benchmarks

The performance benchmark for the Infrastructure Portfolio is to meet or exceed the Consumer Price Index ("CPI") plus 4% net of fees over a rolling 5-year period. The Infrastructure Portfolio's performance is also measured against a dollar-weighted public benchmark, which produced the return that would have been earned if NYC BERS's infrastructure cash flows were invested in an index of 50% Russell 3000<sup>®</sup> and 50% Barclays U.S. Aggregate<sup>®</sup>. The Infrastructure Portfolio is expected to generate a total return, net of investment management fees, of at least 6.5%.

The following graph illustrates Portfolio IRR performance versus benchmarks as of December 31, 2016.



<sup>1</sup>NYC BERS since inception Internal Rate of Return ("IRR") is calculated based on the Portfolio's daily cash flows and market value as of quarter-end. IRR is net of fund managers' fees, expenses and carried interest. **Past performance is not necessarily indicative of future results.** 

<sup>2</sup>Consumer Price Index ("CPI") benchmark represents the compound annual growth rate of the Consumer Price Index for All Urban Consumers and All Items, as provided by the U.S. Department of Labor: Bureau of Labor Statistics, calculated over a five-year rolling period plus a 4.0% premium.

<sup>3</sup>Benchmark is a dollar-weighted PME+ calculation of daily changes in 50% of the Russell 3000<sup>®</sup> Index and 50% of the Barclays U.S. Aggregate<sup>®</sup> Index. These index comparisons are being provided solely for informational purposes as an indication of returns that could be earned by investors by making similar investments in the indexes and should not be relied upon for any purpose. An investor cannot directly invest in an index. Moreover, indices do not reflect commissions or fees that may be charged to an investment product based on the index, which may materially affect the performance data presented.

# Portfolio Diversification

The Program's objective is to build a Portfolio that is diversified by investment strategy, asset type, and geography. The target investment strategy ranges are as follows:

- Core Infrastructure Investments: 60% to 100%; and
- Non-Core Infrastructure Investments: 0% to 40%.

Actual percentages may differ substantially from these targets during the initial years of the Program. The following table illustrates the current diversification of the Portfolio by fund strategy, geography and industry focus.

Market Value		Unfunded Co	ommitment	Exposure	
\$	% of Total	\$	% of Total	\$	% of Total
40.7	100.0%	44.2	80.7%	84.9	88.9%
-	0.0%	10.6	19.3%	10.6	11.1%
40.7	100.0%	54.8	100.0%	95.5	100.0%
10.4	25.6%	21.5	39.1%	31.9	33.4%
30.3	74.4%	33.4	60.9%	63.6	66.6%
40.7	100.0%	54.8	100.0%	95.5	100.0%
34.7	85.2%	34.1	62.2%	68.7	72.0%
6.0	14.8%	20.7	37.8%	26.8	28.0%
40.7	100.0%	54.8	100.0%	95.5	100.0%
	\$ 40.7 - 40.7 10.4 30.3 40.7 34.7 6.0	\$         % of Total           40.7         100.0%           -         0.0%           40.7         100.0%           10.4         25.6%           30.3         74.4%           40.7         100.0%           -         34.7           85.2%         6.0	\$         % of Total         \$           40.7         100.0%         44.2           -         0.0%         10.6           40.7         100.0%         54.8           -         0.0%         21.5           30.3         74.4%         33.4           40.7         100.0%         54.8           -         34.7         85.2%         34.1           6.0         14.8%         20.7	\$ % of Total         \$ % of Total           40.7         100.0%         44.2         80.7%           -         0.0%         10.6         19.3%           40.7         100.0%         54.8         100.0%           40.7         100.0%         54.8         100.0%           10.4         25.6%         21.5         39.1%           30.3         74.4%         33.4         60.9%           40.7         100.0%         54.8         100.0%           34.7         85.2%         34.1         62.2%           6.0         14.8%         20.7         37.8%	\$ % of Total         \$ % of Total         \$           40.7         100.0%         44.2         80.7%         84.9           -         0.0%         10.6         19.3%         10.6           40.7         100.0%         54.8         100.0%         95.5           -         0.0%         21.5         39.1%         31.9           30.3         74.4%         33.4         60.9%         63.6           40.7         100.0%         54.8         100.0%         95.5           -         -         -         -         -           30.3         74.4%         33.4         60.9%         63.6           40.7         100.0%         54.8         100.0%         95.5           -         -         -         -         -           34.7         85.2%         34.1         62.2%         68.7           6.0         14.8%         20.7         37.8%         26.8



# **II. Infrastructure Market Overview**

### **Market Overview**

#### North America

The last quarter of 2016 was marked by the U.S. presidential elections. President-elect Donald Trump vowed to make investments in transport, energy and social infrastructure a focal point of his economic policy through a \$1 trillion investment plan over a 10-year period. Benefiting from the strong investor demand in the space, several renewable developers went to market to monetize their portfolio of operational assets and raise capital for development pipelines, including sPower, 8minuteenergy, Heelstone and Cypress Creek. Deal activity in power generation remained strong with fund managers (e.g. Axium, DE Shaw, Macquarie) and utilities (e.g. Southern Company, ConEdison) as typical buyers. While Fortis effected the take-private of electric transmission company ITC Holdings and Duke Energy closed the takeover of Piedmont Natural Gas, Macquarie initiated the sales process of its 55% interest in New England water utility Aquarion. Globalvia closed the US\$600m acquisition of Pocahontas Parkway, a toll road in Virginia. CDPQ and DP World announced the creation of a CA\$5bn (US\$3.7bn) global container terminal investment vehicle. The platform will be seeded with two of DP World's Canadian container terminals, located on the Pacific Coast in Vancouver and Prince Rupert, with CDPQ acquiring a 45% stake of the combined assets for CA\$865m (US\$640m).

#### Europe

In December 2016 the UK Government released its draft finance bill which included its position on the Base Erosion and Profit Sharing ("BEPS"). The UK wanted to be seen as a leader across Europe in the implementation of BEPS and was one of the first countries to formalize its position. The position taken by the Government was favorable for the infrastructure community as the Public Benefit Infrastructure Exemption was more widely defined than expected and includes asset classes such as renewables. The definition of the Group Ratio Rule was also clarified. Under the current BEPS drafting, generally all third-party debt for infrastructure assets remains deductible, however the same cannot be said for shareholder loans, were the exemptions are less generous and many investee companies are likely to lose the tax benefit of their shareholder loans. Over the quarter, renewable energy across Europe and the UK again saw high transaction activity with a mix of portfolio and asset sales. Core infrastructure continues to draw high prices as demonstrated with the sale of a majority stake in National Grid. The theme of managers and direct investors looking further up the curve by asset or new geographies was seen through KKR's acquisition of Calvin Capital; OTPP and USS's acquisition of crematorium operator Westerleigh; DIF, Swiss Life and First State all agreed deals in Poland which was subject to pre-emption risk and those rights have been utilized by capital behind those rights from Arcus and APG. The transport sector saw a large number of small stakes in roads trade including OHL selling a 4% stake in Abertis and Infrared selling 42% of the A-63 in France.

#### Australia

During the current quarter, the most significant transaction was the sale of AusGrid to IFM and AustralianSuper, where the reported bid price of A\$16.2bn (US\$11.7bn) represented a c.1.41x regulated asset base ("RAB") multiple. The New South Wales government subsequently officially launched the sale of a majority stake of 50.4% in electricity network provider Endeavour Energy, alongside guidance provided by the Foreign Investment Review Board that a single overseas buyer could not hold more than half of the stake on offer and that 20% of the stake must be held by Australian investors. The renewables and transport sectors continued to see strong activity, including AGL Energy's divestment of its Nyngan and Broken Hill solar plants to the Powering Australian Renewables Fund (an equity partnership between AGL and QIC), and Genesee & Wyoming's ("GWA") acquisition of GRail (a coal haulage business previously owned by Glencore), for A\$1.14bn (US\$0.8bn) (or an estimated 10x EBITDA), with a concurrent syndication of a 49% equity stake in GWA to funds managed by Macquarie Infrastructure and Real Assets.

\*Source: InfraDeals and Capital IQ as of December 31, 2016.

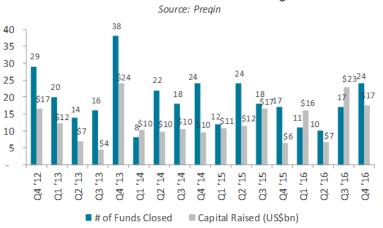


### Infrastructure Fundraising

The level of institutional capital secured by unlisted infrastructure funds was increased in Q4 2016 compared to Q3 2016, in terms of number of funds closed .

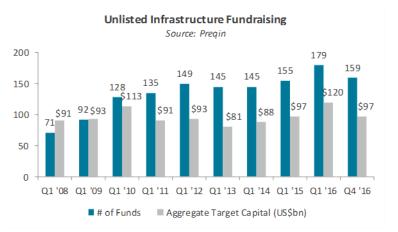
Over the quarter, twenty-four funds held final closings. Aggregate capital raised was US\$17.4 billion. The amount represented a year over year increase of 173% compared to Q3 2015, where 17 funds held a final close raising US\$6.4 billion. This meant that 2016 has had the largest fundraisings in the past seven years, with a 39% increase on fundraisings in 2015.

The largest fund to reach a final closing during 5 2016 was Brookfield Infrastructure Fund III, which raised US\$14 billion of commitments. The raising is the largest unlisted infrastructure fund ever closed. The fund will invest in large-scale greenfield and brownfield infrastructure assets, specifically in energy, utilities and transportation sectors. Unlisted Infrastructure Fundraising



Fund	General Partner	Si	ze (mn)	Location Focus
Brookfield Infrastructure Fund III	Brookfield Asset Management	\$	14,000	Global
Macquarie European Infrastructure Fund V	Macquarie Infrastructure and Real Assets (MIRA)	€	4,000	Europe
Antin Infrastructure Partners III	Antin Infrastructure Partners	€	3,600	Europe
North Haven Infrastructure Partners II	Morgan Stanley Infrastructure	\$	3,600	Global
Stonepeak Infrastructure Partners II	Stonepeak Infrastructure Partners	\$	3,500	North America

At the end of the third quarter, Preqin observed 159 funds in market targeting aggregate capital commitments of US\$97 billion. The largest funds in market include: Alinda Infrastructure Fund III, targeting US\$5 billion, MCPP Infrastructure, targeting US\$5 billion and Copenhagen Infrastructure III, target €3 billion.



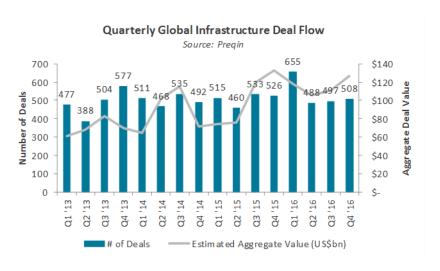


### **Major Transactions**

During the fourth quarter, there were 508 deals announced with an estimated aggregate deal value of US\$127 billion, representing a 14% increase compared to the prior quarter. Notable deals are as below:

In December 2016, in Australia, the New South Wales state government sold electricity network Ausgrid to IFM and AustralianSuper, at a reported price of A\$16.2bn.

Also in December 2016, the Quad Gas Group, a consortium that includes Allianz Capital Partners, China Investment corporation, Dalmore Capital, Hermes and Macquarie Infrastructure and Real Assets was selected as the preferred proponent to acquire a majority stake in National Grid, a UK gas distribution network, for £5.4 billion.



In October 2016, the Lonsdale Consortium which include investors Queensland Investment Corporation, Global Infrastructure Partners, Future Fund, China Investment Corporation and other investors was selected as the preferred proponent to acquire a 50 year lease of Port of Melbourne, a Victoria-based port and Australia's largest container and multi cargo port, for approximately A\$9.7 billion.



# **III. Portfolio Review**

# **Quarterly Highlights**

LICC in millions

US\$ in millions

• **New Investment Commitments** – During the fourth quarter of 2016, the Program closed on one new investment totaling US\$10.6 million. This is shown in the table below.

Investment	Month and Year Closed	Vintage Year	Strategy	Geographic Focus	Industry Focus	Committed Capital
Actis Energy 4	December 2016	2017	Infrastructure	Global	Energy	\$10.6
Total						\$10.6

• **Subsequent Investment Commitments** – Subsequent to quarter-end through June 1, 2017, the Program closed on two new investment commitments totaling US\$20.8 million. This is shown in the table below.

US\$ in millions						
Investment	Month and Year Closed	Vintage Year	Strategy	Geographic Focus	Industry Focus	Committed Capital
EQT Infrastructure III (No.2) SCSp	February 2017	2017	Infrastructure	Global	Diversified	\$8.8
ASF VII Infrastructure L.P.	April 2017	2017	Infrastructure	OECD	Diversified	12.0
Total						\$20.8

- **Cash Outflow Decreased** During the fourth quarter of 2016, the Program made US\$3.1 million of contributions and received US\$0.5 million of distributions, for a net cash outflow of US\$2.7 million. This compared to a net cash outflow of US\$5.6 million during the prior quarter. Net cash flow is expected to remain negative for the next several years as the Program's committed capital is drawn down for investments, fees and expenses by fund managers.
- Valuation Increased During the fourth quarter of 2016, net of cash flow activity, the valuation of the Portfolio increased by approximately US\$0.9 million, or 2.3%, from the prior quarter. The valuation increase reflects the increase in value of underlying investments in First Reserve Energy Infrastructure Fund II, Brookfield Infrastructure Fund II and IFM Global Infrastructure Fund.
- New Underlying Fund Investments During the fourth quarter of 2016, three new investment positions were added to the Portfolio.

Company	Fund(s)	Investment Date	Stage	Industry	Country	Exposed Invested Capital	Exposed Market Value	TVM
Dominion Midstream Partners	First Reserve Energy Infrastructure Fund II, L.P.	Dec-16	Public	Energy	United States	0.3	0.4	1.3x
Lackawanna Energy Partners LLC	First Reserve Energy Infrastructure Fund II, L.P.	Dec-16	Private	Energy	United States	0.1	0.1	1.0x
Petrofirst Infrastructure 2 Limited	First Reserve Energy Infrastructure Fund II, L.P.	Dec-16	Private	Energy	United States	0.3	0.3	1.0x

• No Exits – There were no exits of investment positions during the quarter.



#### Performance by Vintage Year

The following table illustrates the Portfolio's since-inception investment performance by vintage year as of December 31, 2016. Note that the performance of funds that are less than one year old is not meaningful.

Vintage Year	Committed Capital	Contributed Capital	Distributed Capital	Market Value	Total Value	Total Gain/ (Loss)	Unfunded Commitment	Exposure	DPI	τνρι	IRR
2013	\$10.0	\$7.7	\$0.9	\$8.7	\$9.6	\$1.9	\$2.4	\$11.2	0.1x	1.2x	14.8%
2014	49.0	26.9	0.9	28.6	29.5	2.6	23.3	51.8	0.0x	1.1x	7.8%
2016	22.0	3.7	0.1	3.4	3.5	(0.2)	18.5	21.9	NM	NM	NM
2017	10.6	-	-	-	-	-	10.6	10.6	NM	NM	NM
Total	\$91.6	\$38.2	\$1.8	\$40.7	\$42.5	\$4.3	\$54.8	\$95.5	0.0x	1.1x	9.1%

As of December 31, 2016 (US\$ in millions)

#### Performance by Strategy and Industry Focus

The following table illustrates the Portfolio's since-inception investment performance by strategy and industry focus as of December 31, 2016.

As of December 31, 2016 (US\$ in millions)

Strategy/Industry	Committed Capital	Contributed Capital	Distributed Capital	Market Value	Total Value	Total Gain/ (Loss)	Unfunded Commitment	Exposure	DPI	τνρι	IRR
Core	\$81.0	\$38.2	\$1.8	\$40.7	\$42.5	\$4.3	\$44.2	\$84.9	0.0x	1.1x	9.1%
Diversified	66.0	33.2	1.7	34.7	36.3	3.1	34.1	68.7	0.0x	1.1x	7.2%
Energy	15.0	5.0	0.2	6.0	6.2	1.2	10.1	16.2	0.0x	1.2x	32.3%
Non-Core	\$10.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$10.6	\$10.6	NM	NM	NM
Energy	10.6	-	-	-	-	-	10.6	10.6	NM	NM	NM
Total	\$91.6	\$38.2	\$1.8	\$40.7	\$42.5	\$4.3	\$54.8	\$95.5	0.0x	1.1x	9.1%

#### **Performance by Geographic Focus**

The following table and charts illustrate the Portfolio's since-inception investment performance by geographic focus as of December 31, 2016.

As of December 31, 2016 (US\$ in millions)

Geographic Focus	Committed Capital	Contributed Capital	Distributed Capital	Market Value	Total Value	Total Gain/ (Loss)	Unfunded Commitment	Exposure	DPI	турі	IRR
Global	\$30.6	\$9.2	\$0.9	\$10.4	\$11.3	\$2.0	\$21.5	\$31.9	0.1x	1.2x	14.9%
OECD	61.0	29.0	1.0	30.3	31.2	2.2	33.4	63.6	0.0x	1.1x	6.6%
Total	\$91.6	\$38.2	\$1.8	\$40.7	\$42.5	\$4.3	\$54.8	\$95.5	0.0x	1.1x	9.1%

\*Past performance is not necessarily indicative of future results and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.



# **Portfolio Diversification**

#### By Strategy, Geography and Industry Focus

The Program's objective is to build a Portfolio that is diversified by investment strategy, asset type, and geography. The target investment strategy ranges are as follows:

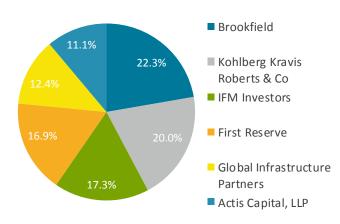
- Core Infrastructure Investments: 60% to 100%; and
- Non-Core Infrastructure Investments: 0% to 40%.

Actual percentages may differ substantially from these targets during the initial years of the Program. The following table illustrates the current diversification of the Portfolio by fund strategy, geography and industry focus.

	Market Value		Unfunded Commitment		Exposure	
As of December 31, 2016 (US\$ in millions)	\$	% of Total	\$	% of Total	\$	% of Total
By Strategy:						
Core	40.7	100.0%	44.2	80.7%	84.9	88.9%
Non-Core	-	0.0%	10.6	19.3%	10.6	11.1%
Total	40.7	100.0%	54.8	100.0%	95.5	100.0%
By Geographic Focus:						
Global	10.4	25.6%	21.5	39.1%	31.9	33.4%
OECD	30.3	74.4%	33.4	60.9%	63.6	66.6%
Total	40.7	100.0%	54.8	100.0%	95.5	100.0%
By Industry Focus:						
Diversified	34.7	85.2%	34.1	62.2%	68.7	72.0%
Energy	6.0	14.8%	20.7	37.8%	26.8	28.0%
Total	40.7	100.0%	54.8	100.0%	95.5	100.0%

#### **By Investment Manager**

As of December 31, 2016, the Program had made seven investment commitments to six managers. NYC BERS seeks to limit its exposure to any single manager to no more than 10% of the total Infrastructure Program when fully invested. As the Program matures and closes on additional commitments, the single manager exposure is expected to decline significantly. Below is the Portfolio's current exposure by manager.

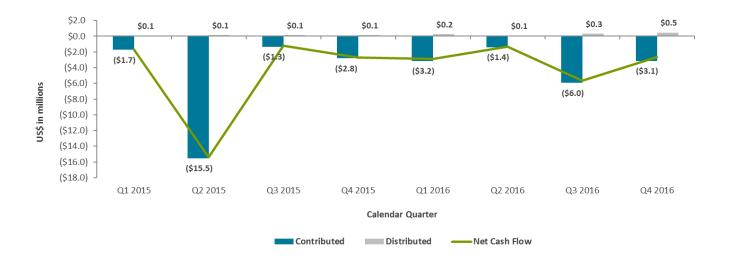




# **Portfolio Cash Flow Analysis**

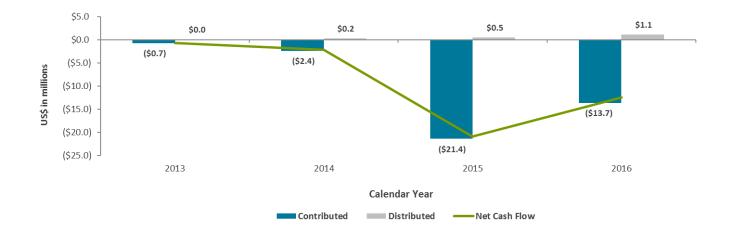
#### **Quarterly Cash Flow Activity**

During the fourth quarter of 2016, the Program made US\$3.1 million of contributions and received US\$0.5 million of distributions, for a net cash outflow of US\$2.7 million. As of December 31, 2016, six fund investments in the Portfolio had cash flow activity. As the Program's commitment and investment activity increases, net cash outflow is expected to increase. The graph below illustrates cash flow activity since inception by calendar quarter.



#### **Annual Cash Flow Activity**

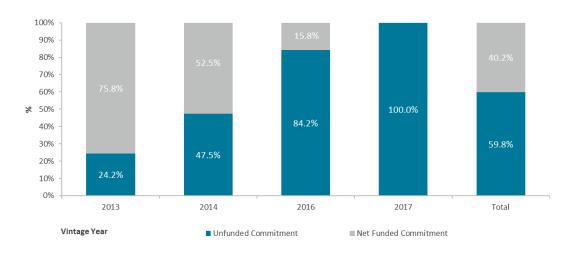
During 2016, the Program made US\$13.7 million of contributions and received US\$1.1 million of distributions, for a net cash outflow of US\$12.5 million. The graph below illustrates cash flow activity since inception by calendar year.





#### Net Funded and Unfunded Commitments by Vintage Year

The following chart illustrates the Portfolio's net funded commitments (defined as total contributions inside commitment less any returns of excess capital and recallable distributions) as a percentage of total capital commitments, by fund vintage year, as of December 31, 2016. Overall, the Portfolio was 59.8% unfunded as of quarter-end.



Net Funded and Unfunded Commitment by Vintage Year (%)

The following chart illustrates the Portfolio's net funded commitments relative to total capital commitments, by fund vintage year, as of December 31, 2016. Overall, the Portfolio had US\$54.8 million of unfunded commitments as of quarterend.



#### Net Funded and Unfunded Commitment by Vintage Year (US\$ millions)

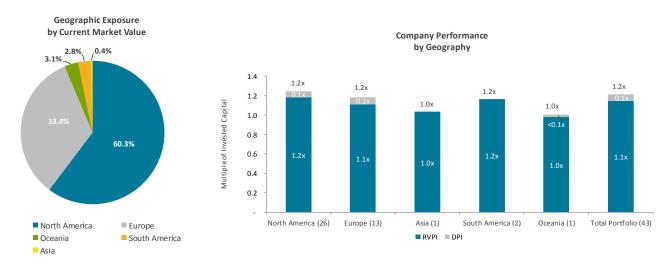


### **Portfolio Company-Level Analysis**

As of quarter-end, the Portfolio had exposure to 43 unique portfolio companies/investment positions. As the Portfolio matures, the number of unique portfolio companies/investment positions is expected to increase significantly. On the individual fund level, all current investments are within the single investment limitation of 15% of total fund size. The Program's individual portfolio investment exposure is relatively concentrated as a result of the relative immaturity of the Program.

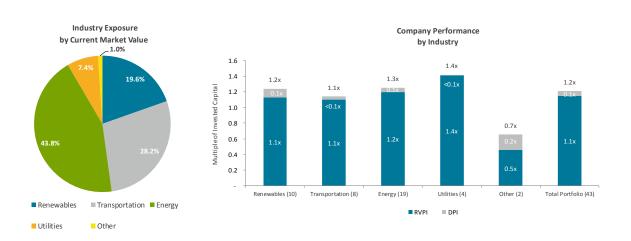
#### **Geographic Exposure and Performance**

The following charts illustrate the Portfolio's current exposure and performance by geographic region at the portfolio company level.



#### **Industry Exposure and Performance**

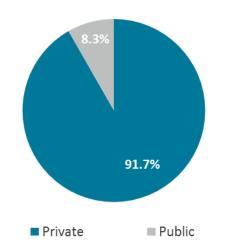
The following charts illustrate the Portfolio's current exposure and performance by industry at the portfolio company level.





#### **Public Market Exposure**

As of quarter-end, publicly traded investments comprised 8.3% of the Portfolio's exposed market value. The following chart illustrates the current public market exposure at the portfolio company level.



#### Public Market Exposure Current Market Value



# **IV. Risk Management Matrix**

Category	Requirement	Status	Status Notes
Allocation	NYC BERS has an Infrastructure allocation target of 4% of total pension assets.	✓	The market value of NYC BERS Infrastructure Program represents approximately 0.8% of total pension assets. As the Program matures, its market value as a percentage of the total NYC BERS pension assets is expected to increase.
Performance vs. Benchmarks	The performance benchmark for the Infrastructure Portfolio is to meet or exceed: (i) The Consumer Price Index ("CPI") plus 4% net of fees over a rolling 5-year period and (ii) A dollar-weighted PME+ ("PME") calculation of daily changes in 50% of the Russell 3000 <sup>®</sup> Index and 50% of the Barclays U.S. Aggregate <sup>®</sup> Index. The Infrastructure Portfolio is expected to generate a total return, net of investment management fees, of at least 6.5%.	✓	As of December 31, 2016, the Portfolio outperformed the CPI and PME benchmark by 3.7% and 4.1%, respectively. However, given the relative immaturity of the Portfolio, the current performance to-date versus benchmarks is not meaningful.
Strategy Diversification	Core Infrastructure Investments: 60-100% Non-Core Infrastructure Investments: 0-40% Actual percentages may differ substantially from these targets during the initial years of the Program.	✓	The Program is in compliance with the Core/Non-Core allocation ranges. Currently the Program has 89% exposure to Core investments and 11% exposure to Non-Core investments.
Asset Type & Location Diversification	The Program will seek diversification by asset type, revenue drivers, and geography. The portfolio may include a variety of assets including but not limited to electricity transmission, pipelines, airports, toll roads, communication towers and electric generators, windmills etc. to vary the sources of revenue to the portfolio.	✓	Given the relative immaturity of the Portfolio, it is not yet diversified by asset type. The asset types and geographic location of current Portfolio investments are in compliance with the Program's Investment Policy Statement and Permissible Markets.
Leverage	The average leverage of all investments in the Program is to be no higher than 65%.	$\checkmark$	The Program is in compliance with the average leverage limitation. The current leverage level is 40.5% <sup>1</sup> .
Single Investment Size & Manager Diversification	The maximum commitment to a single investment is limited to no more than 15% of the aggregate committed capital of each fund. The maximum commitment to a single manager is limited to 10% of the total Infrastructure Program allocation when fully invested.	✓	On the individual fund level, all current investments are in compliance with the single investment limitation of 15% of total fund size. The Program is in compliance with the single manager limitation of 10% of the total Infrastructure Program. The Program's manager exposure is currently relatively concentrated as a result of the relative immaturity of the Program. Manager diversification is expected to increase as the Program closes on new investment commitments.

<sup>1</sup>The Program's leverage level is calculated by using a weighted average of each underlying investment's leverage and Net Asset Value as of December 31, 2016.

# **APPENDICES:**

**Basket Clause** 

#### **BERS - BASKET/NON BASKET SUMMARY**

As of March 31st 2017

	Adjusted Fund Policy			Fund Actual (PE & RE on an invested basis)			
				Non			
Equity	Non Basket*	Basket*	Total	Basket*	Basket*	Total	
Domestic Equity	36.5%	0.0%	36.5%	36.3%	0.0%	36.3%	
Non-U.S. Equity	10.0%	10.7%	20.7%	10.0%	13.3%	23.3%	
Private Equity	0.0%	5.0%	5.0%	0.0%	5.0%	5.0%	
Real Estate - Core	3.6%	0.0%	3.6%	3.6%	0.0%	3.6%	
Real Estate - Opportunistic	2.2%	0.0%	2.2%	2.2%	0.0%	2.2%	
Private Infrastructure	0.8%	0.0%	0.8%	0.8%	0.0%	0.8%	
Total Equity	53.1%	15.7%	68.8%	52.9%	18.3%	71.2%	
Fixed Income							
U.S. Treasuries – All Maturities	0.0%	0.0%	0.0%	6.1%	0.0%	6.1%	
U.S. Treasuries - Longer Than Five Years	9.5%	0.0%	9.5%	0.0%	0.0%	0.0%	
Core Mortgage-Backed Securities	2.5%	0.0%	2.5%	3.4%	0.0%	3.4%	
Credit - Investment Grade Corporates	4.0%	0.5%	4.5%	4.9%	0.5%	5.4%	
High Yield	6.0%	0.0%	6.0%	5.1%	0.0%	5.1%	
Bank Loans	0.0%	2.0%	2.0%	0.0%	2.2%	2.2%	
TIPS	4.3%	0.5%	4.8%	4.2%	0.5%	4.7%	
Economically Targeted Investments	2.0%	0.0%	2.0%	0.6%	0.0%	0.6%	
Other Fixed Income	0.0%	0.0%	0.0%	1.4%	0.0%	1.4%	
Total Fixed Income	28.2%	3.0%	31.2%	25.6%	3.2%	28.8%	
Total Fund	81.3%	18.7%	100.0%	78.5%	21.5%	100.0%	

#### **Remaining Capacity**

6.3%

3.5%

\* Note: Basket amounts are estimates

Liquidity Analysis

## **BERS Liquidity Profile - Static Analysis**

AUM as of March 31, 2017

		Liquid Assets				
	Current MV	Today	1 Year	2 Years		
PUBLIC EQUITY	\$3,037	\$3,037	\$3,037	\$3,037		
U.S.	1,850	1,850	1,850	1,850		
EAFE Equity	801	801	801	801		
Emerging Markets	386	386	386	386		
PUBLIC FIXED INCOME	\$1,469	\$1,455	\$1,461	\$1,461		
Short Term Securities	69	69	69	69		
U.S. Government	308	308	308	308		
Mortgages						
Core Mortgages	173	173	173	173		
ETI	30	16	22	22		
Credit - Investment Grade	276	276	276	276		
Corporate - Hight Yield	261	261	261	261		
Corporate - Bank Loans	113	113	113	113		
UST - Inflation Protected	238	238	238	238		
ALTERNATIVE ASSETS	\$591	\$0	\$0	\$0		
Private Equity	255	0	0	0		
Private Real Estate	293	0	0	0		
Infrastructure	43	0	0	0		
Total Assets	\$5,097	\$4,491	\$4,498	\$4,498		
Total Illiquid \$		\$605	\$599	\$599		
Total Illiquid %		11.9%	11.8%	11.8%		
Unfunded INF Commitments	\$76					
Unfunded PE Commitments	\$246					
Unfunded RE Commitments	166					
Total commitments \$	\$487					
Total commitments %	9.6%					

6/5/17

6/5/17

# BERS Liquidity Profile - Static Analysis

AUM as of March 31, 2017

Denominator Effect - Decrease AUM by One-Third							
Total Illiquid \$	\$605	\$599	\$599				
Total Illiquid %	17.8%	17.6%	17.6%				

Note: Assumes zero realizations, no new commitments and a five-year investment period; funded out of liquids

		Liquid Assets				
	Current MV	Today	1 Year	2 Years		
Total Assets	\$5,097	\$4,491	\$4,498	\$4,498		
Private Equity, Real Estate and	d Infrastructure Fixed Income S	tress Case				
Unfunded INF Commitments			\$15	\$30		
Unfunded PE Commitments Dra		\$49	\$98			
Unfunded RE Commitments Dra	awn		33	66		
Total commitments \$			\$97	\$195		
Total commitments %			1.9%	3.8%		
Total Illiquid \$			\$696	\$794		
Total Illiquid %		13.7%	15.6%			
Note: Assumes zero realizations	no new commitments and a five	-vear investment ner	iod <sup>.</sup> funded out of lia	uids		

Note: Assumes zero realizations, no new commitments and a five-year investment period; funded out of liquids

Denominator Effect - Decrease AUM by One-Third						
Total Illiquid \$	\$605	\$696	\$794			
Total Illiquid %	17.8%	20.5%	23.4%			
Note: Assumes zero realizations, no new commitments and a five-year investment period; funded out of liquids						