



Independent ASRS Investment Program Oversight for the Period Ending September 30, 2024

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NEPC, LLC

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DISCLOSURE

- **NEPC has developed reports for both the Investment Committee and Board designed to 1) provide the appropriate level of investment information for the purposes of independent oversight (ASRS SAAP compliance, Asset Class Committee minutes review, investment selection due diligence packet compliance and oversight of the investment program data used to compile NEPC and ASRS reporting); 2) provide ASRS investment program performance relative to its goals/objectives (presented quarterly); and 3) communicate NEPC's perspectives on the market environment, investment outlook or other initiatives or topics they believe are important to convey to the Board.**

- **NEPC has completed a quarter-end quality control process and warrants that IMD Staff materials are accurate subject to the following process:**
 - Investment results were calculated using data provided by the Plan's custodian bank that is deemed "final" as of September 30, 2024.
 - Investment performance oversight includes reconciliation and confirmation of portfolio level valuations, cash flows, transactions and composite construction including interpretation of investment accounting methods used to track IMD Staff instructed activities.
 - Oversight of performance calculation includes verification of Staff data used to produce reporting as well as verification of processes and procedures in custom investment performance calculations.
 - NEPC performed tests of the data produced by IMD Staff and the Plan's custodian bank (book of record) using underlying financial records provided by the custodian bank and IMD Staff. The net effect of uncorrected misstatements has been brought to the attention of IMD Staff.

ASRS INVESTMENT OBJECTIVES



PROPRIETARY & CONFIDENTIAL

ASRS INVESTMENT OBJECTIVES

Goal 2: Excel at Investment Performance				
	Ongoing Objectives	Goal Met	Comment	Action Required
1	Maximize total fund net rates of return for acceptable levels of risk.	Yes	ASRS maintains high peer ranks in risk-adjusted returns.	None
2	Achieve total fund net rates of return in the top 25th percentile or better compared to peers.	Partial	Short-run peer rankings are below median. Longer-run trailing time periods are ranked in the top quartile.	None
3	Achieve total fund net rates of return greater than the Strategic Asset Allocation Policy benchmark	Partial	Total Fund underperformed its SAAP in the last one-year period. Private Equity and Credit underperformed. Over longer time periods, Private Equity, Credit and Real Estate are driving outperformance.	None
4	Achieve total fund net rates of return greater than the actuarial assumed interest rate.	Partial	Three-year trailing total fund return underperformed the assumed rate. Trailing time periods of one-year, five-year, ten-year, and since inception exceed 7%.	None
5	Achieve asset class net rates of return that are greater than their respective benchmarks.	Partial	Private Equity and Credit underperformed in the last one-year.	None
6	Ensure sufficient cash is always available to meet all internal and external cash-flow requirements.	Yes	ASRS maintained sufficient cash to operate the Fund.	None

Source: ASRS Strategic Plan For the Five Fiscal Year Period from July 1, 2023 to June 30, 2028

Note: Total Fund comparison versus Interim SAAP



EXPECTED 20 YEAR RETURN

Asset Class	Policy Target
Public Equity	44.0%
Private Equity	10.0%
Interest Rate Sensitive	6.0%
Credit	23.0%
Real Estate	17.0%
20 Year Expected Return as of December 31, 2021	7.2%¹
20 Year Expected Return as of June 30, 2024	7.6%²
ASRS Actuarial Rate of Return	7.0%³

Note:

Asset allocation approved by the Board on September 30, 2022.

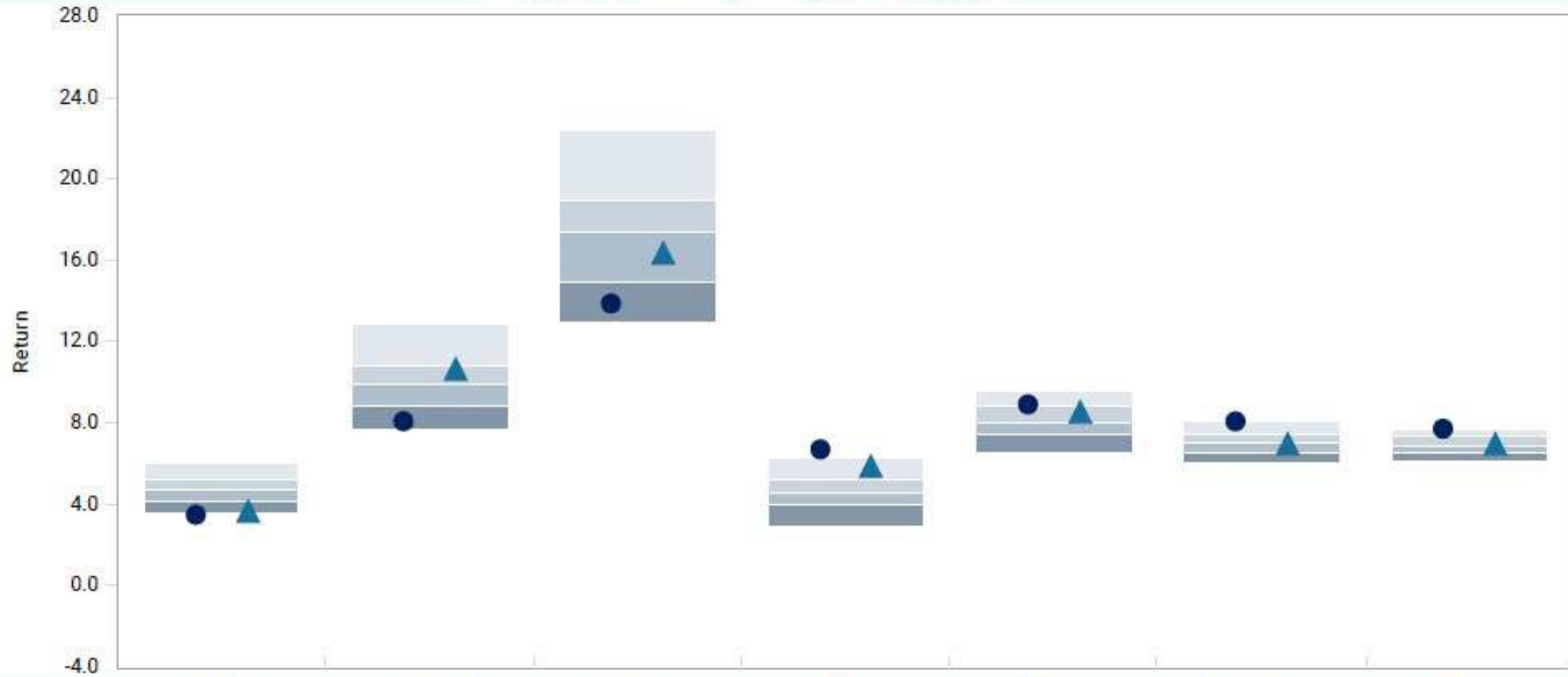
1 - Based on NEPC capital markets assumptions as of December 31, 2021. For Credit and Real Estate, ASRS assumptions and RCLCO capital markets assumptions are used respectively.

2 - Based on NEPC capital markets assumptions as of June 30, 2024. For Credit and Real Estate, ASRS assumptions and RCLCO capital markets assumptions are used respectively.

3 - ASRS Actuarial Rate of Return As of July 30, 2021.

UNIVERSE COMPARISON - PERFORMANCE

Total Fund vs. InvMetrics Public DB > \$1 Billion

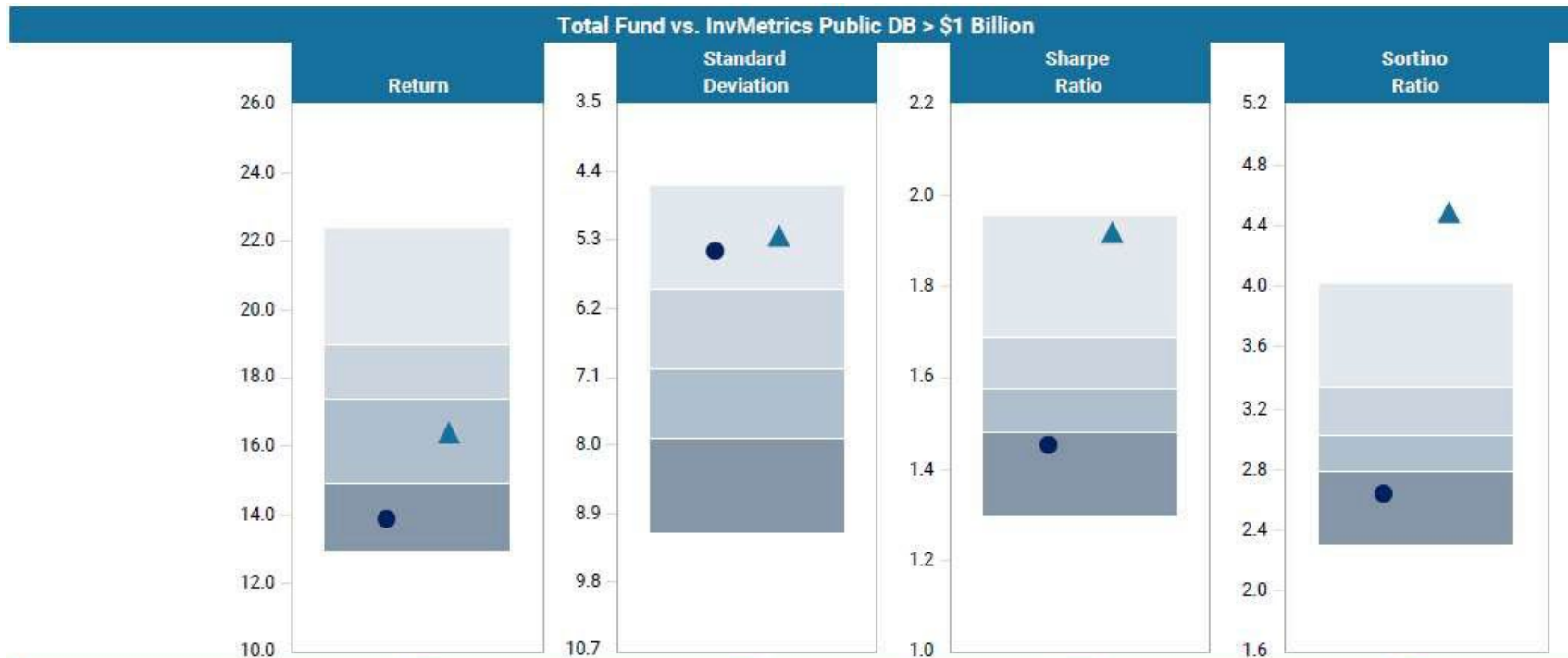


	3 Mo (%) (Percentile)	YTD (%) (Percentile)	1 Year (%) (Percentile)	3 Years (%) (Percentile)	5 Years (%) (Percentile)	10 Years (%) (Percentile)	20 Years (%) (Percentile)
● Total Fund	3.48 (98)	8.12 (88)	13.88 (87)	6.71 (2)	8.97 (20)	8.07 (9)	7.71 (6)
▲ Interim SAA Policy	3.68 (94)	10.66 (31)	16.38 (65)	5.91 (12)	8.59 (29)	7.01 (50)	7.02 (45)
5th Percentile	6.10	12.88	22.42	6.31	9.59	8.12	7.71
1st Quartile	5.28	10.89	18.95	5.26	8.79	7.49	7.40
Median	4.72	9.92	17.41	4.63	8.03	7.00	6.95
3rd Quartile	4.12	8.87	14.90	4.00	7.49	6.51	6.54
95th Percentile	3.58	7.71	12.98	2.93	6.59	6.05	6.14
Population	104	104	104	101	100	96	73
Total Fund Ordinal Rank	102	92	90	2	20	9	4
Interim SAA Ordinal Rank	98	32	68	12	29	48	33

Universes are constructed using net of fee returns; therefore, ASRS rank is based on net of fee returns. Rankings are from highest (1) to lowest (100) in the InvMetrics Public Funds > \$1 Billion Net Universe.



UNIVERSE COMPARISON – 1 YEAR



	1 Yr (%) (Percentile)	1 Yr (%) (Percentile)	1 Yr (%) (Percentile)	1 Yr (%) (Percentile)
● Total Fund	13.88 (87)	5.45 (20)	1.45 (78)	2.65 (81)
▲ Interim SAA Policy	16.38 (65)	5.26 (13)	1.92 (8)	4.49 (2)
5th Percentile	22.42	4.58	1.96	4.03
1st Quartile	18.95	5.95	1.69	3.34
Median	17.41	6.99	1.58	3.03
3rd Quartile	14.90	7.90	1.48	2.78
95th Percentile	12.98	9.16	1.29	2.30
Population	104	104	104	104
Total Fund Ordinal Rank	90	21	81	84
Interim SAA Ordinal Rank	68	14	8	2



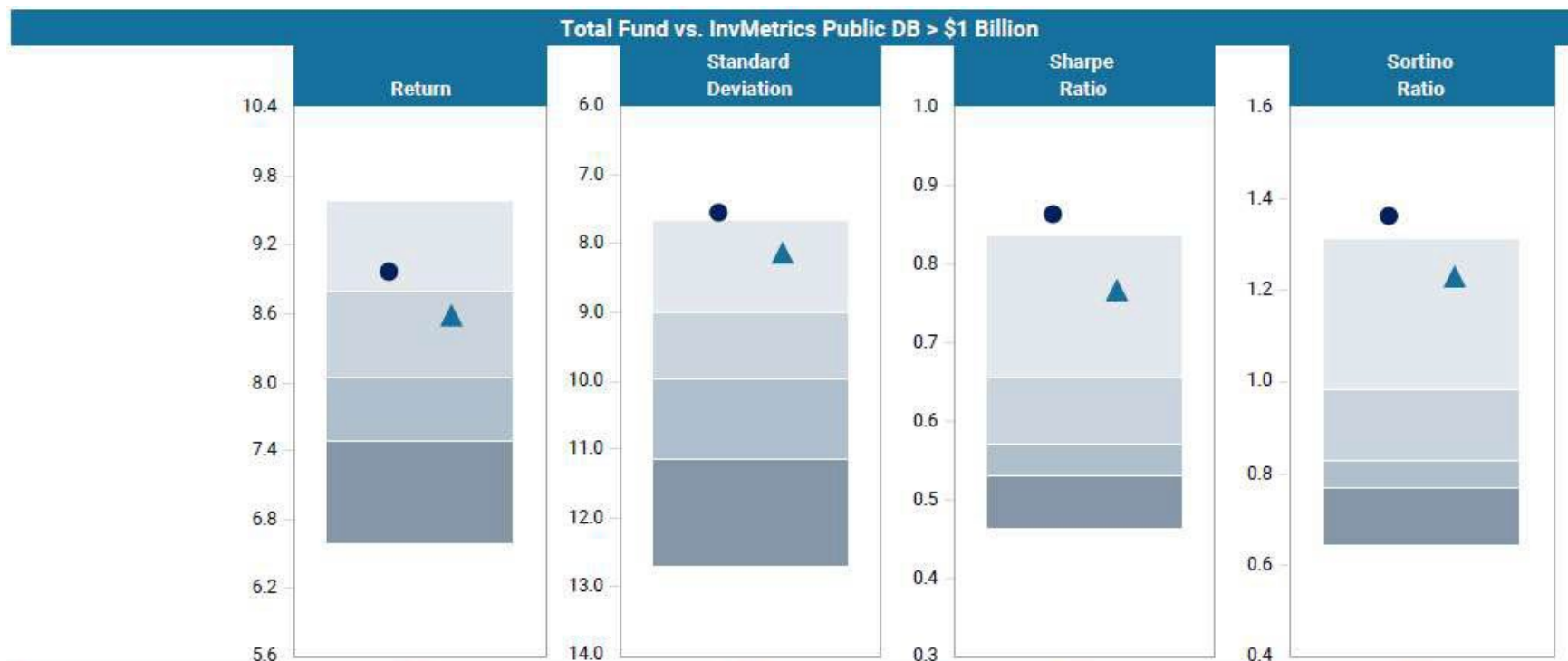
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UNIVERSE COMPARISON – 3 YEARS



Universes are constructed using net of fee returns; therefore, ASRS rank is based on net of fee returns. Rankings are from highest (1) to lowest (100) in the InvMetrics Public Funds > \$1 Billion Net Universe. The standard deviation of all returns, both the total fund and universe, may be understated due to private markets assets being valued on a quarterly basis with a 1 quarter lag.

UNIVERSE COMPARISON – 5 YEARS



	5 Yrs (%) (Percentile)	5 Yrs (%) (Percentile)	5 Yrs (%) (Percentile)	5 Yrs (%) (Percentile)
● Total Fund	8.97 (20)	7.55 (4)	0.87 (4)	1.36 (4)
▲ Interim SAA Policy	8.59 (29)	8.14 (13)	0.77 (11)	1.23 (9)
5th Percentile	9.59	7.67	0.84	1.32
1st Quartile	8.79	8.99	0.65	0.98
Median	8.03	9.99	0.57	0.83
3rd Quartile	7.49	11.15	0.53	0.77
95th Percentile	6.59	12.73	0.46	0.64
Population	100	100	100	100
Total Fund Ordinal Rank	20	4	4	4
Interim SAA Ordinal Rank	29	13	11	9



Universes are constructed using net of fee returns; therefore, ASRS rank is based on net of fee returns.

Rankings are from highest (1) to lowest (100) in the InvMetrics Public Funds > \$1 Billion Net Universe.

The standard deviation of all returns, both the total fund and universe, may be understated due to private markets assets being valued on a quarterly basis with a 1 quarter lag.

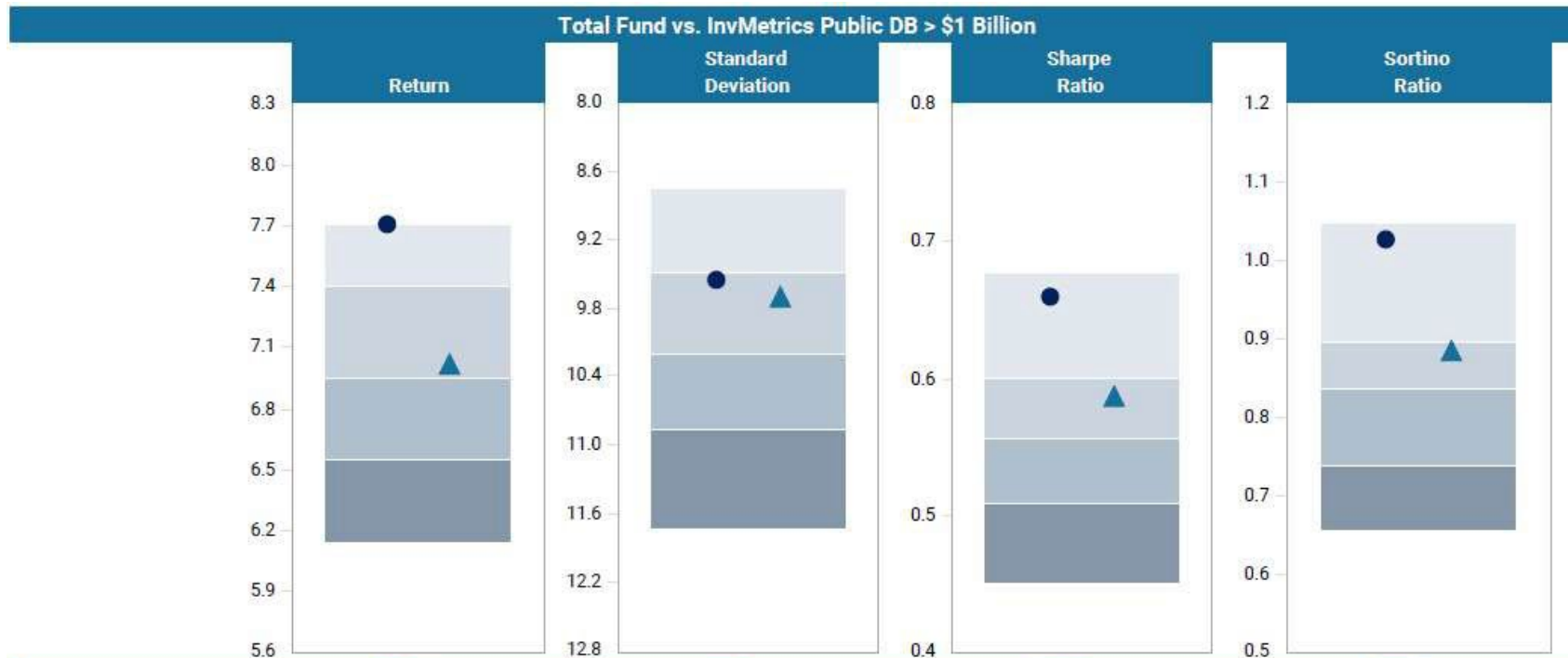
UNIVERSE COMPARISON – 10 YEARS



Universes are constructed using net of fee returns; therefore, ASRS rank is based on net of fee returns. Rankings are from highest (1) to lowest (100) in the InvMetrics Public Funds > \$1 Billion Net Universe. The standard deviation of all returns, both the total fund and universe, may be understated due to private markets assets being valued on a quarterly basis with a 1 quarter lag.



UNIVERSE COMPARISON – 20 YEARS



	20 Years (%) (Percentile)	20 Years (%) (Percentile)	20 Years (%) (Percentile)	20 Years (%) (Percentile)
● Total Fund	7.71 (6)	9.55 (30)	0.66 (11)	1.03 (10)
▲ Interim SAA Policy	7.02 (45)	9.69 (33)	0.59 (33)	0.89 (29)
5th Percentile	7.71	8.76	0.68	1.05
1st Quartile	7.40	9.49	0.60	0.90
Median	6.95	10.19	0.56	0.84
3rd Quartile	6.54	10.87	0.51	0.74
95th Percentile	6.14	11.74	0.45	0.66
Population	73	73	73	73
Total Fund Ordinal Rank	4	22	9	7
Interim SAA Ordinal Rank	33	24	24	21



Universes are constructed using net of fee returns; therefore, ASRS rank is based on net of fee returns.

Rankings are from highest (1) to lowest (100) in the InvMetrics Public Funds > \$1 Billion Net Universe.

The standard deviation of all returns, both the total fund and universe, may be understated due to private markets assets being valued on a quarterly basis with a 1 quarter lag.

TOTAL FUND PERFORMANCE NET OF FEES

	Performance (%)								Inception Date
	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Years (%)	Inception (%)	
Total Fund	3.48 (98)	8.12 (88)	13.88 (87)	6.71 (2)	8.97 (20)	8.07 (9)	7.71 (6)	9.56	Jul-75
<i>Interm SAA Policy</i>	3.68 (94)	10.66 (31)	16.38 (65)	5.91 (12)	8.59 (29)	7.01 (50)	7.02 (45)	9.15	
Over/Under	-0.20	-2.54	-2.50	0.80	0.38	1.06	0.69	0.41	
<i>InvMetrics Public DB > \$1 Billion Median</i>	4.72	9.92	17.41	4.63	8.03	7.00	6.95		

ASSET CLASS PERFORMANCE VS. BENCHMARK

	1 Year Return	3 Year Return
Public Equity (TWR)	32.02%	8.12%
ASRS Custom Public Equity Benchmark (TWR)	31.68%	7.91%
Excess Return	0.34%	0.21%
Private Equity (TWR)	5.47%	10.12%
ASRS Custom Private Equity Benchmark (TWR)	18.72%	4.99%
Excess Return	-13.25%	5.13%
Interest Rate Sensitive (TWR)	9.80%	-1.88%
ASRS Custom IRS Benchmark (TWR)	9.72%	-2.18%
Excess Return	0.08%	0.30%
Credit (TWR)	8.34%	8.93%
ASRS Custom Credit Benchmark (TWR)	13.87%	8.78%
Excess Return	-5.53%	0.15%
Real Estate (TWR)	-5.56%	2.92%
NCREIF ODCE Net 1 Qtr. Lag (TWR)	-9.99%	1.02%
Excess Return*	4.43%	1.90%

Note: Composition of ASRS Custom Asset Class Benchmarks can be found in the appendix.

TWR is Time Weighted Return

CASH MANAGEMENT

Month	External CFs	Last day of the Month Ending Balance*
Sep - 23	(\$77.3)	\$305.9
Oct - 23	(\$80.7)	\$693.2
Nov - 23	(\$62.1)	\$515.8
Dec - 23	(\$38.7)	\$675.2
Jan - 24	(\$81.6)	\$515.2
Feb - 24	(\$84.4)	\$527.0
Mar - 24	(\$68.7)	\$608.1
Apr - 24	(\$79.4)	\$446.7
May - 24	(\$5.7)	\$481.6
June - 24	(\$67.4)	\$510.2
July - 24	(\$170.81)	\$500.6
Aug - 24	(\$85.74)	\$222.9
Sep - 24	(\$97.98)	\$687.7

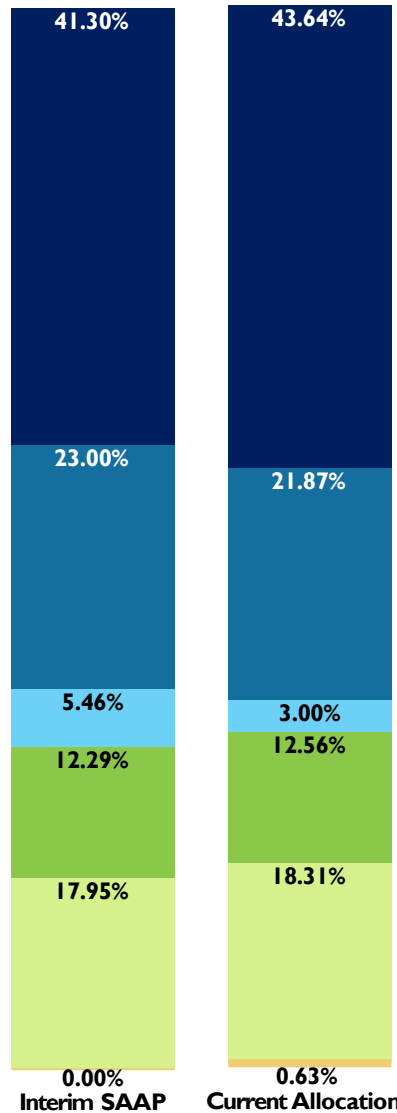
*Includes assetized & unassetized cash balances (Inception of 1/26/15); represents monies to be used for funding needs that occur in subsequent month(s). Generally, monthly pension payments occur on the first day of month.

INDEPENDENT OVERSIGHT/ COMPLIANCE



SAA COMPLIANCE POLICY

Interim SAAP vs. Current Allocation



Assets	Current Mkt Value	Current Allocation	Interim SAAP	Interim SAAP Difference	Policy Range	Within Range	SAAP
Public Equity	24,911,039,947	43.64	41.30	2.34	34.00 - 59.00	Yes	44.00
Credit	12,480,400,667	21.87	23.00	-1.13	17.00 - 26.00	Yes	23.00
Interest Rate Sensitive	1,711,626,159	3.00	5.46	-2.46	3.00 - 12.00	Yes	6.00
Private Equity	7,167,410,299	12.56	12.29	0.27	7.00 - 13.00	Yes	10.00
Real Estate	10,449,525,505	18.31	17.95	0.36	12.00 - 21.00	Yes	17.00
Cash	357,882,819	0.63	0.00	0.63	0.00 - 5.00	Yes	0.00
Other	305,367	0.00	0.00	0.00	0.00 - 10.00	Yes	0.00
Total	57,078,190,762	100.00	100.00	0.00			100.00

Note:

Values shown for private markets portfolios include cash flows that occurred during Q3 2024.

Total Equity market value includes futures positions profit and loss as well as notional values of futures positions.

Includes values in transition account.

Policy Ranges shown are relative to the long-term SAAP and may cause some asset classes to be out of range while implementation of the long-term SAAP is in process.

PERFORMANCE DETAIL

	Allocation		Performance (%)							
	Market Value (\$)	% of Portfolio	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Fund	57,078,190,762	100.00	3.48 (98)	8.12 (88)	13.88 (87)	6.71 (2)	8.97 (20)	8.07 (9)	9.56	Jul-75
Interm SAA Policy			3.68	10.66	16.38	5.91	8.59	7.01	9.15	
Over/Under			-0.20	-2.54	-2.50	0.80	0.38	1.06	0.41	
InvMetrics Public DB > \$1 Billion Median			4.72	9.92	17.41	4.63	8.03	7.00		
Total Public Equity	24,911,039,947	43.64	6.48	17.90	32.02	8.12	12.02	9.45	7.78	Jan-98
ASRS Custom Total Public Equity Benchmark			6.45	17.83	31.68	7.91	12.28	9.84	7.48	
Over/Under			0.03	0.07	0.34	0.21	-0.26	-0.39	0.30	
Total Domestic Equity	16,203,139,098	28.39	6.22	20.73	35.67	10.54	14.85	12.46	11.55	Jul-75
ASRS Custom Domestic Equity Benchmark			6.18	20.66	35.31	10.40	15.44	13.17	11.74	
Over/Under			0.04	0.07	0.36	0.14	-0.59	-0.71	-0.19	
Total International Equity	8,707,900,849	15.26	6.96	13.00	25.74	4.35	8.04	5.59	6.12	Apr-87
ASRS Custom Int'l Equity Benchmark			6.95	12.91	25.43	4.01	7.83	5.54	5.88	
Over/Under			0.01	0.09	0.31	0.34	0.21	0.05	0.24	
Total Private Equity	7,167,410,299	12.56	1.39	4.02	5.47	10.12	13.32	12.53	9.53	Jan-08
ASRS Custom Private Equity Benchmark			2.45	22.82	18.72	4.99	10.67	9.01	8.39	
Over/Under			-1.06	-18.80	-13.25	5.13	2.65	3.52	1.14	
Interest Rate Sensitive	1,711,626,159	3.00	4.68	3.92	9.80	-1.88	0.08	1.85	7.06	Jul-75
ASRS Custom IRS Benchmark			4.74	3.84	9.72	-2.18	-0.15	1.60		
Over/Under			-0.06	0.08	0.08	0.30	0.23	0.25		
Credit	12,480,400,667	21.87	1.72	5.76	8.34	8.93	9.05	8.35	8.72	Oct-12
ASRS Custom Credit Benchmark			2.53	9.39	13.87	8.78	8.15	6.78	6.38	
Over/Under			-0.81	-3.63	-5.53	0.15	0.90	1.57	2.34	
Total Real Estate	10,449,525,505	18.31	0.02	-4.95	-5.56	2.92	3.31	7.04	5.57	Oct-05
NCREIF ODCE Net 1 Qtr. Lag			-0.66	-8.06	-9.99	1.02	2.27	5.47	5.27	
Over/Under			0.68	3.11	4.43	1.90	1.04	1.57	0.30	

PUBLIC MARKET ASSET CLASS ANALYSIS

	3 Years Return	3 Years Standard Deviation	3 Years Tracking Error	3 Years Information Ratio	3 Years Jensen Alpha	3 Years Beta	3 Years Sharpe Ratio
Total Public Equity	8.12	16.79	0.19	1.02	0.19	1.00	0.35
ASRS Custom Total Public Equity Benchmark	7.91	16.77	0.00		0.00	1.00	0.34
Total Domestic Equity	10.54	17.90	0.16	0.88	0.12	1.00	0.46
ASRS Custom Domestic Equity Benchmark	10.40	17.85	0.00		0.00	1.00	0.45
Total International Equity	4.35	16.50	0.41	0.78	0.33	1.00	0.13
ASRS Custom Int'l Equity Benchmark	4.01	16.53	0.00		0.00	1.00	0.11
Interest Rate Sensitive	-1.88	6.99	0.19	1.58	0.22	0.99	-0.75
ASRS Custom IRS Benchmark	-2.18	7.09	0.00		0.00	1.00	-0.78

	5 Years Return	5 Years Standard Deviation	5 Years Tracking Error	5 Years Information Ratio	5 Years Jensen Alpha	5 Years Beta	5 Years Sharpe Ratio
Total Public Equity	12.02	17.84	0.40	-0.53	-0.27	1.01	0.60
ASRS Custom Total Public Equity Benchmark	12.28	17.73	0.00		0.00	1.00	0.61
Total Domestic Equity	14.85	18.92	0.69	-0.68	-0.66	1.01	0.71
ASRS Custom Domestic Equity Benchmark	15.44	18.64	0.00		0.00	1.00	0.74
Total International Equity	8.04	17.40	0.40	0.44	0.22	0.99	0.40
ASRS Custom Int'l Equity Benchmark	7.83	17.52	0.00		0.00	1.00	0.39
Interest Rate Sensitive	0.08	5.82	0.20	1.10	0.20	0.99	-0.36
ASRS Custom IRS Benchmark	-0.15	5.88	0.00		0.00	1.00	-0.39

PRIVATE MARKETS PERFORMANCE - IRR

AS OF JUNE 30, 2024

	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)
Private Equity (IRR)	0.95	4.95	9.65	13.21	12.27	12.67
<i>MSCI PE North America & Europe*</i>	0.84	5.81	7.85	15.63	14.39	12.47
Credit (IRR)	1.67	8.13	8.87	9.14	9.13	9.63
<i>MSCI Private Debt U.S. and Europe</i>	1.21	7.32	7.64	8.49	8.01	8.83
Real Estate (IRR)	0.23	-5.95	2.39	3.03	5.76	6.06
<i>NCREIF ODCE Net 1 Qtr. Lag</i>	-0.66	-9.99	1.02	2.27	5.47	5.27

Source: BNY Mellon/ MSCI Burgiss

* Buyout and Expansion Capital for North America and Western Europe



ASSET CLASS COMMITTEE MEETINGS

FIDUCIARY OVERSIGHT

Six Combined Asset Class Committee Meetings were convened during the second quarter of 2024.

- **August 13, 2024 – Combined Asset Class Committee**

- Private Equity manager recommendation (\$75mm)
 - Staff recommendation to commit of new capital with an existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Vote postponed
- Real Estate manager recommendation
 - Staff and extension consultant recommendation to approve modifications to an existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

- **August 16, 2024 – Combined Asset Class Committee**

- Private Equity manager recommendation (\$75mm - continuation from CACC on 8/13/2024)
 - Staff recommendation to commit of new capital with an existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

ASSET CLASS COMMITTEE MEETINGS

FIDUCIARY OVERSIGHT

- **August 20, 2024 – Combined Asset Class Committee**

- Real Estate manager recommendation
 - Staff and extension consultant recommendation to approve sale of an asset within an existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Private Equity manager recommendation
 - Staff recommendation terminate auto-renewal within an existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

- **August 26, 2024 – Combined Asset Class Committee**

- Real Estate manager recommendation
 - Staff and extension consultant recommendation to approve variances to the Financing Guidelines
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Real Estate manager recommendation
 - Staff and extension consultant recommendation to approve negotiated terms with an existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

ASSET CLASS COMMITTEE MEETINGS

FIDUCIARY OVERSIGHT

- **September 3, 2024 – Combined Asset Class Committee**

- Private Equity manager recommendation
 - Staff recommendation to approve sale of assets within an existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Private Equity manager recommendation
 - Staff recommendation to approve sale of assets within an existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

- **September 10, 2024 – Combined Asset Class Committee**

- Private Equity manager recommendation (\$75mm)
 - Staff recommendation to approve commitment of new capital with existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Credit manager recommendation (\$350mm)
 - Staff recommendation to approve commitment of capital with existing investment manager relationship
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Credit manager recommendation
 - Staff recommendation to reduce commitments with existing investment manager relationships
 - Due diligence process was followed in accordance with SP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

GENERAL OBSERVATIONS

- **The investment objectives of ASRS as specified in the Strategic Plan are being met over the long term.**
 - Objectives not being met in the shorter-term is largely driven by the mismatch in private markets investment valuations and public market benchmarks
- **Public Equity is driving strong absolute returns in the shorter term. In the longer term, Private Equity and Credit have contributed significantly to the portfolio performance.**
 - Both Private Equity and Credit asset classes have outperformed the respective benchmarks for all periods 3 years and longer
 - Real Estate is contributing positively to relative performance over the last 10 years and the program has not participated fully in the broader market's declines
- **Asset class allocations as of the end of 3Q 2024 are in line with the Interim SAAP**
 - Private Equity and Real Estate allocations are now in line with the Interim SAAP target
 - Current positioning in the asset classes are largely consistent with the market movement and IMD house views



APPENDIX

SAA POLICY HISTORY

STRATEGIC ASSET ALLOCATION POLICY HISTORY

- 7/1/75 – 12/31/79 – 40% S&P 500/60% Barclays Capital Aggregate
- 1/1/80 – 12/31/83 – 50% S&P 500/50% Barclays Capital Aggregate
- 1/1/84 – 12/31/91 – 60% S&P 500/40% Barclays Capital Aggregate
- 1/1/92 – 12/31/94 – 50% S&P 500/10% MSCI EAFE/40% Barclays Capital Aggregate
- 1/1/95 – 6/30/97 – 45% S&P 500/15% MSCI EAFE/40% Barclays Capital Aggregate
- 7/1/97 – 12/31/99 – 50% S&P 500/15% MSCI EAFE/35% Barclays Capital Aggregate
- 1/1/00 – 9/30/03 – 53% S&P 500/17% MSCI EAFE/30% Barclays Capital Aggregate
- 10/1/03 – 12/31/06 – 53% S&P 500/15% MSCI EAFE/ACWI ex-U.S.¹/26% Barclays Capital Aggregate/6% NCREIF ODCE (lagged one quarter)
- 1/1/07 – 10/31/2009 – 31% S&P 500/7% S&P 400/7% S&P 600/18% MSCI ACWI ex-U.S./5% Russell 2000 (lagged one quarter)/26% Barclays Capital Aggregate/6% NCREIF ODCE (lagged one quarter)
- 11/1/2009 – 6/30/2012 – 28% S&P 500/6% S&P 400/6% S&P 600/13% MSCI EAFE/2% MSCI EAFE Small Cap/3% MSCI Emerging Markets/7% Russell 2000 (lagged one quarter)/24% Barclays Capital Aggregate/2% Barclays Capital High Yield/6% NCREIF ODCE (lagged one quarter)/3% Dow Jones/UBS Commodities Index
- 7/1/2012 – 3/31/2015 – 23% S&P 500/5% S&P 400/5% S&P 600/14% MSCI EAFE/3% MSCI EAFE Small Cap/6% MSCI Emerging Markets/7% Russell 2000 (lagged one quarter)/13% Barclays Capital Aggregate/5% Barclays Capital High Yield/4% JP Morgan GBI-EM Global Diversified/3% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/8% NCREIF ODCE (lagged one quarter)/4% Dow Jones/UBS Commodities Index
- 4/1/2015 – 3/31/2017 – 20% S&P 500/3% S&P 400/3% S&P 600/17% MSCI EAFE/2% MSCI EAFE Small Cap/5% MSCI Emerging Markets/8% Russell 2000 (lagged one quarter)/11% Barclays Capital Aggregate/4% Barclays Capital High Yield/10% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/10% NCREIF ODCE (lagged one quarter)/2% Bloomberg Commodities Index TR/5% Multi-Asset Class Custom Index
- 4/1/2017 – 6/30/2018 – 20% S&P 500/3% S&P 400/3% S&P 600/17% MSCI EAFE/2% MSCI EAFE Small Cap/5% MSCI Emerging Markets/8% Russell 2000 (lagged one quarter)/11% Barclays Capital Aggregate/2% Barclays Capital High Yield/12% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/10% NCREIF ODCE (lagged one quarter)/2% Bloomberg Commodities Index TR/5% Multi-Asset Class Custom Index
- 7/1/2018 – 9/30/2022 – 40% MSCI ACWI IMI Net w/ USA Gross, 10% MSCI ACWI IMI Net w/ USA Gross 1 Quarter Lagged, 20% NCREIF ODCE, 20% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter), 10% Barclays US Capital Aggregate
- 10/1/2022 – 7/31/2023 – 44% MSCI ACWI IMI Net w/ USA Gross, 10%, 10% MSCI ACWI IMI Net w/ USA Gross 1 Quarter Lagged, 17% NCREIF ODCE, 23% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter), 6% ASRS Custom IRS (Interest Rate Sensitive) Benchmark
- 10/1/2022 – Present – 44% MSCI ACWI IMI Custom, 10% MSCI ACWI IMI Net w/ USA Gross 1 Quarter Lagged, 17% NCREIF ODCE, 23% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter), 6% ASRS Custom IRS (Interest Rate Sensitive) Benchmark

***Interim SAA Policy: 41.30% MSCI ACWI IMI Custom, 12.29% MSCI ACWI IMI Net w/ USA Gross 1 Quarter Lagged, 5.46% ASRS Custom IRS (Interest Rate Sensitive) Benchmark, 17.95% NCREIF ODCE, 23% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)**

Note: Interim SAA Policy includes proration of a total of Interest Rate Sensitive, Public Equity, Private Equity and Real Estate. Unfunded amounts were allocated 83.3% to Equity and 16.7% to Interest Sensitive Fixed Income.



Note: All International MSCI indices changed from Gross to Net of dividend withholding taxes effective 1/1/2014.

STRATEGIC ASSET ALLOCATION POLICY HISTORY

- **ASRS Custom Total Public Equity Benchmark** was 77% S&P 500, 23% MSCI EAFE through 12/31/1999; 76% S&P 500, 24% MSCI EAFE through 9/30/2003; 78% S&P 500, 22% MSCI EAFE/ACWI ex-U.S.¹ through 12/31/2006; 49% S&P 500, 11% S&P 400, 11% S&P 600, 29% MSCI ACWI ex-U.S. through 10/31/2009; 48% S&P 500, 10% S&P 400, 10% S&P 600, 23% MSCI EAFE, 4% MSCI EAFE Small Cap, 5% MSCI Emerging Markets through 6/30/2012; 41% S&P 500, 9% S&P 400, 9% S&P 600, 25% MSCI EAFE, 5% MSCI EAFE Small Cap, 11% MSCI Emerging Markets through 3/31/2015; 40% S&P 500, 6% S&P 400, 6% S&P 600, 34% MSCI EAFE, 4% MSCI EAFE Small Cap, 10% MSCI Emerging Markets through 6/30/2018; MSCI ACWI IMI w/USA Gross (Net) through 7/31/2023; MSCI ACWI IMI Custom thereafter.
- **ASRS Custom Domestic Equity Benchmark** was S&P 500 through 12/31/2006; 74% S&P 500, 13% S&P 400, 13% S&P 600 through 12/31/2010; 70% S&P 500, 15% S&P 400, 15% S&P 600 through 3/31/2015.; 77% S&P 500, 11.5% S&P 400, 11.5% S&P 600 through 6/30/2018; 100% MSCI USA IMI thereafter.
- **ASRS Custom Domestic Large Cap Equity Benchmark** was the S&P 500 Index through 6/30/2018; MSCI USA Large Cap Index thereafter.
- **ASRS Custom Domestic Mid Cap Equity Benchmark** was the S&P 400 Index through 6/30/2018; MSCI USA Mid Cap Index thereafter.
- **ASRS Custom Small Cap Equity Benchmark** was the Russell 2000 Index through 12/31/2006; S&P 600 Index through 6/30/2018; MSCI USA Small Cap Index thereafter.
- **ASRS Custom International Equity Benchmark** was MSCI EAFE through 9/30/2005; MSCI ACWI ex-U.S. through 12/31/2010; 72% MSCI EAFE, 11% MSCI EAFE Small Cap and 17% MSCI Emerging Markets through 6/30/2012; 61% MSCI EAFE, 13% MSCI EAFE Small Cap and 26% MSCI Emerging Markets through 3/31/2015; 71% MSCI EAFE, 8% MSCI EAFE Small Cap and 21% MSCI Emerging Markets through 6/30/2018; MSCI ACWI IMI ex USA through 7/31/2023; MSCI ACWI IMI ex USA Custom thereafter.
- **ASRS Custom Private Equity Benchmark** was the Russell 2000 Index 1 quarter lagged from inception to 6/30/2018; MSCI ACWI IMI Net w/ USA Gross 1 quarter lagged thereafter.
- **Custom Credit Benchmark** was 42% BBG US High Yield Index, 25% S&P LSTA Index lagged 1 quarter + 2.50%, 33% JP Morgan GBI-EM Global Diversified from 7/1/2012-3/31/2015; 29% BBG US High Yield Index, 71% S&P LSTA Index lagged 1 quarter + 2.50% from 4/1/2015-3/31/2017; 14% BBG US High Yield Index, 86% S&P LSTA Index lagged 1 quarter + 2.50% from 4/1/2017-6/30/2018; 100% S&P LSTA Index lagged 1 quarter + 2.50% thereafter
- **ASRS Custom IRS (Interest Rate Sensitive) Benchmark** was Bloomberg US Aggregate Bond Index from inception to 11/14/2022; Bloomberg US Treasury Index from 11/15/2022 thereafter

¹MSCI EAFE/ACWI ex-U.S. Benchmark is the MSCI EAFE Index prior to 10/1/2005 and the MSCI ACWI ex-U.S. thereafter.

Note: All International MSCI indices changed from Gross to Net of dividend withholding taxes effective 1/1/2014.

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- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
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