

# FUND EVALUATION REPORT

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## Plymouth County Retirement Association

Investment Review  
October 24, 2019



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- 1. Estimated Retirement Association Performance**
- 2. Interim Update as of August 31, 2019**
- 3. Passive RFP Respondent Review**
- 4. Appendices**
  - Disclaimer, Glossary, and Notes

## **Estimated Retirement Association Performance**

### Estimated Aggregate Performance<sup>1</sup>

	September <sup>2</sup> (%)	QTD (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
<b>Total Retirement Association</b>	<b>1.0</b>	<b>-0.4</b>	<b>10.9</b>	<b>0.9</b>	<b>6.6</b>	<b>5.6</b>	<b>7.6</b>
<i>60% MSCI ACWI/40% Barclays Global Aggregate</i>	0.9	0.3	12.4	4.2	6.6	4.9	6.1
<i>Policy Benchmark</i>	1.2	0.3	10.5	2.2	7.4	6.2	8.1

### Benchmark Returns

	September (%)	QTD (%)	YTD (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
<i>Russell 3000</i>	1.8	1.2	20.1	2.9	12.8	10.4	13.1
<i>MSCI EAFE</i>	2.9	-1.1	12.8	-1.3	6.5	3.3	4.9
<i>MSCI Emerging Markets</i>	1.9	-4.3	5.9	-2.0	6.0	2.3	3.4
<i>Barclays Aggregate</i>	-0.5	2.3	8.5	10.3	2.9	3.5	3.8
<i>Barclays TIPS</i>	-1.4	1.4	7.6	7.1	2.2	2.5	3.5
<i>Barclays High Yield</i>	0.4	1.3	11.4	6.4	6.1	5.4	7.9
<i>JPM GBI-EM Global Diversified</i>	1.0	-0.8	7.9	10.1	3.1	0.6	2.5
<i>S&amp;P Global Natural Resources</i>	3.0	-6.0	7.0	-11.0	7.0	1.1	1.7

### Estimated Total Fund Assets

	September Estimate
<b>Total Retirement Association</b>	<b>\$1,053,994,638</b>

<sup>1</sup> The September performance estimates are calculated using index returns as of September 30, 2019 for each asset class. No performance estimate was included for private equity, real estate, infrastructure, and private natural resources asset classes.

<sup>2</sup> As of September 30, 2019



**Interim Update  
As of August 31, 2019**

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As of August 31, 2019

## Asset Class Net Performance Summary

	Market Value (\$)	% of Portfolio	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Yrs (%)	Inception (%)	Inception Date
<b>Total Retirement Association</b>	<b>1,033,707,867</b>	<b>100.0</b>	<b>-1.6</b>	<b>-1.4</b>	<b>9.7</b>	<b>-0.3</b>	<b>6.2</b>	<b>4.8</b>	<b>7.9</b>	<b>6.4</b>	<b>7.7</b>	<b>Nov-89</b>
60% MSCI ACWI / 40% Barclays Global Aggregate			-0.6	-0.5	11.4	3.2	6.5	4.1	6.4	6.0	6.6	Nov-89
Custom Benchmark - Policy Benchmark (Net)			-1.2	-0.9	9.2	1.8	7.3	5.5	8.3	7.2	--	Nov-89
<b>Domestic Equity Assets</b>	<b>228,051,611</b>	<b>22.1</b>	<b>-3.3</b>	<b>-2.0</b>	<b>18.8</b>	<b>-3.5</b>	<b>11.9</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>12.1</b>	<b>Jan-16</b>
Russell 3000			-2.0	-0.6	18.0	1.3	12.2	9.6	13.3	9.1	12.2	Jan-16
<b>International Developed Market Equity Assets</b>	<b>110,558,491</b>	<b>10.7</b>	<b>-3.3</b>	<b>-4.7</b>	<b>6.8</b>	<b>-8.4</b>	<b>4.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>3.7</b>	<b>Jan-16</b>
MSCI EAFE			-2.6	-3.8	9.7	-3.3	5.9	1.9	5.0	5.3	5.0	Jan-16
<b>International Emerging Market Equity Assets</b>	<b>103,446,065</b>	<b>10.0</b>	<b>-3.8</b>	<b>-5.1</b>	<b>4.6</b>	<b>-6.7</b>	<b>4.8</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>7.0</b>	<b>Jan-16</b>
MSCI Emerging Markets			-4.9	-6.0	3.9	-4.4	5.8	0.4	4.1	8.1	8.6	Jan-16
<b>Global Equity Assets</b>	<b>102,112,218</b>	<b>9.9</b>	<b>-1.6</b>	<b>-1.0</b>	<b>15.1</b>	<b>4.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.5</b>	<b>Feb-18</b>
MSCI ACWI			-2.4	-2.1	13.8	-0.3	9.2	5.5	8.6	7.1	-1.5	Feb-18
<b>Core Fixed Income</b>	<b>89,722,399</b>	<b>8.7</b>	<b>1.6</b>	<b>2.0</b>	<b>8.3</b>	<b>8.6</b>	<b>3.1</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>4.1</b>	<b>Jan-16</b>
75% Bbg Barclays Aggregate/25% Bbg Barclays US TIPs 1-10 year			2.3	2.5	8.5	9.1	2.9	3.0	3.7	--	3.9	Jan-16
<b>Value Added Fixed Income</b>	<b>130,458,590</b>	<b>12.6</b>	<b>-0.6</b>	<b>0.3</b>	<b>7.4</b>	<b>5.9</b>	<b>5.1</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>6.9</b>	<b>Jan-16</b>
Custom Benchmark (1)			0.3	1.2	10.2	7.9	5.3	--	--	--	7.5	Jan-16
<b>Hedge Funds (2)</b>	<b>62,760,591</b>	<b>6.1</b>	<b>-0.4</b>	<b>0.2</b>	<b>11.2</b>	<b>1.2</b>	<b>5.6</b>	<b>3.7</b>	<b>--</b>	<b>--</b>	<b>4.5</b>	<b>Feb-10</b>
HFRI Fund of Funds Composite Index			-0.7	-0.5	5.7	0.3	3.4	2.0	2.9	3.0	2.7	Feb-10
<b>Real Estate (3)</b>	<b>87,103,195</b>	<b>8.4</b>	<b>0.1</b>	<b>0.1</b>	<b>5.5</b>	<b>6.8</b>	<b>4.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>5.1</b>	<b>Jan-16</b>
80% NCREIF ODCE / 20% Wilshire REIT			0.7	1.0	6.5	7.8	7.3	--	--	--	7.6	Jan-16
<b>Private Equity (4)</b>	<b>54,395,389</b>	<b>5.3</b>	<b>0.0</b>	<b>0.0</b>	<b>1.4</b>	<b>0.5</b>	<b>5.4</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>3.6</b>	<b>Jan-16</b>
Cambridge Associates Fund of Funds Composite 1-Quarter Lag			0.0	0.0	2.8	10.6	11.9	10.8	12.2	11.5	10.1	Jan-16
<b>Real Assets (5)</b>	<b>50,988,085</b>	<b>4.9</b>	<b>-0.1</b>	<b>-0.2</b>	<b>1.9</b>	<b>2.1</b>	<b>0.2</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-1.6</b>	<b>Jan-16</b>
CPI + 3%			0.3	0.9	3.4	4.8	5.1	4.5	4.8	5.0	5.1	Jan-16
<b>Cash and Cash Equivalent</b>	<b>14,111,233</b>	<b>1.4</b>										

(1) The custom benchmark is comprised of 33% BBgBarc US High Yield/ 33% Credit Suisse Leveraged Loans/ 33% JP Morgan EMBI Global diversified.

(2) EntrustPermal Special Opportunities Evergreen and Entrust Special Opportunities III is lagged as of June 30, 2019.

(3) The market value and performance is one quarter lagged.

(4) The market value and performance is one quarter lagged.

(5) The market value and performance is one quarter lagged.



As of August 31, 2019

## Trailing Net Performance

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total Retirement Association</b>	<b>1,033,707,867</b>	<b>100.0</b>	<b>--</b>	<b>-1.6</b>	<b>-1.4</b>	<b>9.7</b>	<b>-0.3</b>	<b>6.2</b>	<b>4.8</b>	<b>7.9</b>	<b>7.7</b>	<b>Nov-89</b>
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>				<i>-0.6</i>	<i>-0.5</i>	<i>11.4</i>	<i>3.2</i>	<i>6.5</i>	<i>4.1</i>	<i>6.4</i>	<i>6.6</i>	<i>Nov-89</i>
<b>Domestic Equity Assets</b>	<b>228,051,611</b>	<b>22.1</b>	<b>22.1</b>	<b>-3.3</b>	<b>-2.0</b>	<b>18.8</b>	<b>-3.5</b>	<b>11.9</b>	<b>--</b>	<b>--</b>	<b>12.1</b>	<b>Jan-16</b>
<i>Russell 3000</i>				<i>-2.0</i>	<i>-0.6</i>	<i>18.0</i>	<i>1.3</i>	<i>12.2</i>	<i>9.6</i>	<i>13.3</i>	<i>12.2</i>	<i>Jan-16</i>
Rhumblin Russell 1000 Value	34,891,173	3.4	15.3	-2.9	-2.1	13.7	0.6	8.0	6.5	--	9.3	Apr-13
<i>Russell 1000 Value</i>				<i>-2.9</i>	<i>-2.1</i>	<i>13.8</i>	<i>0.6</i>	<i>8.1</i>	<i>6.6</i>	<i>11.5</i>	<i>9.4</i>	<i>Apr-13</i>
Rhumblin Russell 1000 Growth	35,084,579	3.4	15.4	-0.8	1.5	23.2	4.3	16.9	13.0	15.3	15.4	Jul-09
<i>Russell 1000 Growth</i>				<i>-0.8</i>	<i>1.5</i>	<i>23.3</i>	<i>4.3</i>	<i>17.0</i>	<i>13.1</i>	<i>15.4</i>	<i>15.5</i>	<i>Jul-09</i>
Fisher Midcap Value	42,798,398	4.1	18.8	-3.8	-3.1	18.4	-3.3	11.1	7.9	12.7	7.3	Apr-07
<i>Russell MidCap Value</i>				<i>-3.5</i>	<i>-2.7</i>	<i>14.8</i>	<i>-3.1</i>	<i>6.5</i>	<i>5.9</i>	<i>12.5</i>	<i>6.6</i>	<i>Apr-07</i>
Boston Company Small Cap Growth	50,466,136	4.9	22.1	-3.4	-1.5	28.9	-0.4	18.7	13.6	15.0	15.0	Aug-09
<i>Russell 2000 Growth</i>				<i>-4.3</i>	<i>-3.4</i>	<i>16.3</i>	<i>-11.0</i>	<i>10.6</i>	<i>8.1</i>	<i>13.1</i>	<i>13.1</i>	<i>Aug-09</i>
LMCG Small Cap Value	64,788,763	6.3	28.4	-4.2	-3.2	12.1	-11.7	4.6	5.5	--	7.3	Mar-11
<i>Russell 2000 Value</i>				<i>-5.6</i>	<i>-5.4</i>	<i>7.3</i>	<i>-14.9</i>	<i>5.0</i>	<i>4.6</i>	<i>10.0</i>	<i>7.3</i>	<i>Mar-11</i>
<b>International Developed Market Equity Assets</b>	<b>110,558,491</b>	<b>10.7</b>	<b>10.7</b>	<b>-3.3</b>	<b>-4.7</b>	<b>6.8</b>	<b>-8.4</b>	<b>4.0</b>	<b>--</b>	<b>--</b>	<b>3.7</b>	<b>Jan-16</b>
<i>MSCI EAFE</i>				<i>-2.6</i>	<i>-3.8</i>	<i>9.7</i>	<i>-3.3</i>	<i>5.9</i>	<i>1.9</i>	<i>5.0</i>	<i>5.0</i>	<i>Jan-16</i>
KBI Master Account	47,688,431	4.6	43.1	-3.3	-4.8	3.3	-9.2	2.0	-1.4	3.4	2.9	Jul-05
<i>MSCI EAFE</i>				<i>-2.6</i>	<i>-3.8</i>	<i>9.7</i>	<i>-3.3</i>	<i>5.9</i>	<i>1.9</i>	<i>5.0</i>	<i>4.2</i>	<i>Jul-05</i>
HGK TS International Equity	28,797,233	2.8	26.0	-3.3	-4.2	8.3	-6.3	6.8	2.9	--	5.3	Feb-11
<i>MSCI EAFE</i>				<i>-2.6</i>	<i>-3.8</i>	<i>9.7</i>	<i>-3.3</i>	<i>5.9</i>	<i>1.9</i>	<i>5.0</i>	<i>3.6</i>	<i>Feb-11</i>
Copper Rock International Small Cap	34,072,827	3.3	30.8	-3.2	-4.8	11.3	-10.2	--	--	--	-7.5	Nov-17
<i>MSCI EAFE Small Cap</i>				<i>-2.5</i>	<i>-3.2</i>	<i>9.0</i>	<i>-9.2</i>	<i>6.0</i>	<i>4.3</i>	<i>7.7</i>	<i>-4.7</i>	<i>Nov-17</i>

## Total Retirement Association

As of August 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>International Emerging Market Equity Assets</b>	<b>103,446,065</b>	<b>10.0</b>	<b>10.0</b>	<b>-3.8</b>	<b>-5.1</b>	<b>4.6</b>	<b>-6.7</b>	<b>4.8</b>	<b>--</b>	<b>--</b>	<b>7.0</b>	<b>Jan-16</b>
<i>MSCI Emerging Markets</i>				-4.9	-6.0	3.9	-4.4	5.8	0.4	4.1	8.6	Jan-16
LMCG Emerging Markets	46,344,777	4.5	44.8	-4.5	-6.4	1.0	-10.4	3.3	-1.6	--	0.2	Sep-13
<i>MSCI Emerging Markets</i>				-4.9	-6.0	3.9	-4.4	5.8	0.4	4.1	2.4	Sep-13
ABS Emerging Markets	21,350,946	2.1	20.6	-3.6	-4.8	6.8	--	--	--	--	6.8	Dec-18
<i>MSCI Emerging Markets</i>				-4.9	-6.0	3.9	-4.4	5.8	0.4	4.1	1.2	Dec-18
Copper Rock Emerging Markets Small Cap	10,197,621	1.0	9.9	-3.6	-5.8	2.4	--	--	--	--	2.4	Dec-18
<i>MSCI Emerging Markets Small Cap</i>				-5.0	-6.4	-0.1	-10.4	1.1	-1.4	3.8	-1.8	Dec-18
Driehaus Emerging Markets Growth	25,552,721	2.5	24.7	-2.6	-2.8	--	--	--	--	--	1.9	Mar-19
<i>MSCI Emerging Markets</i>				-4.9	-6.0	3.9	-4.4	5.8	0.4	4.1	-4.7	Mar-19
<b>Global Equity Assets</b>	<b>102,112,218</b>	<b>9.9</b>	<b>9.9</b>	<b>-1.6</b>	<b>-1.0</b>	<b>15.1</b>	<b>4.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.5</b>	<b>Feb-18</b>
<i>MSCI ACWI</i>				-2.4	-2.1	13.8	-0.3	9.2	5.5	8.6	-1.5	Feb-18
First Eagle Global Value Fund	19,854,767	1.9	19.4	-1.1	-0.9	12.4	3.3	--	--	--	-0.5	Feb-18
<i>MSCI ACWI</i>				-2.4	-2.1	13.8	-0.3	9.2	5.5	8.6	-1.5	Feb-18
Kopernik Global All Cap Fund	18,338,549	1.8	18.0	-3.3	-3.6	6.1	6.9	--	--	--	-5.3	Feb-18
<i>MSCI ACWI</i>				-2.4	-2.1	13.8	-0.3	9.2	5.5	8.6	-1.5	Feb-18
Lee Munder Global Multi-Cap Strategy	27,897,142	2.7	27.3	-3.2	-3.7	10.5	-5.3	--	--	--	-1.6	Mar-18
<i>MSCI ACWI</i>				-2.4	-2.1	13.8	-0.3	9.2	5.5	8.6	1.2	Mar-18
Wellington Durable Enterprises, L.P.	36,021,760	3.5	35.3	0.4	2.5	26.2	12.2	--	--	--	13.0	Mar-18
<i>MSCI ACWI</i>				-2.4	-2.1	13.8	-0.3	9.2	5.5	8.6	1.2	Mar-18
<b>Core Fixed Income</b>	<b>89,722,399</b>	<b>8.7</b>	<b>8.7</b>	<b>1.6</b>	<b>2.0</b>	<b>8.3</b>	<b>8.6</b>	<b>3.1</b>	<b>--</b>	<b>--</b>	<b>4.1</b>	<b>Jan-16</b>
75% Bbg Barclays Aggregate/25% Bbg Barclays US TIPs 1-10 year				2.3	2.5	8.5	9.1	2.9	3.0	3.7	3.9	Jan-16
IR&M Core Bonds	59,456,127	5.8	66.3	2.2	2.5	8.8	9.2	3.1	3.0	4.1	4.4	Nov-04
75% Bbg Barclays Aggregate/25% Bbg Barclays US TIPs 1-10 year				2.3	2.5	8.5	9.1	2.9	3.0	3.7	4.1	Nov-04
Lord Abbett Short Duration Credit Trust II	30,266,272	2.9	33.7	0.6	--	--	--	--	--	--	0.6	Aug-19
BBgBarc US Credit 1-3 Yr TR				0.8	0.8	4.1	5.1	2.4	2.1	2.5	0.8	Aug-19

As of August 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Value Added Fixed Income</b>	<b>130,458,590</b>	<b>12.6</b>	<b>12.6</b>	<b>-0.6</b>	<b>0.3</b>	<b>7.4</b>	<b>5.9</b>	<b>5.1</b>	<b>--</b>	<b>--</b>	<b>6.9</b>	<b>Jan-16</b>
<i>Custom Benchmark</i>				0.3	1.2	10.2	7.9	5.3	--	--	7.5	Jan-16
Eaton Vance High Yield	21,807,580	2.1	16.7	0.6	1.1	10.8	6.7	5.5	4.9	8.3	7.0	Apr-06
<i>ICE BofAML US High Yield TR</i>				0.4	0.9	11.2	6.7	6.2	4.9	8.5	7.3	Apr-06
THL Bank Loan Select Fund	36,385,726	3.5	27.9	-0.3	0.3	5.3	2.9	4.4	4.1	--	5.3	Sep-10
<i>Credit Suisse Leveraged Loans</i>				-0.3	0.5	5.9	3.4	4.8	3.9	5.7	4.8	Sep-10
Franklin Templeton Emerging Market Bonds	31,791,000	3.1	24.4	-3.5	-2.0	5.3	7.3	5.2	3.6	6.7	6.7	May-06
<i>JP Morgan EMBI Global Diversified</i>				0.7	2.0	13.5	13.8	4.9	5.5	7.4	7.4	May-06
Manulife Strategic Fixed Income	30,404,283	2.9	23.3	1.3	--	--	--	--	--	--	1.3	Jul-19
<i>BBgBarc Multiverse TR</i>				1.8	1.6	7.5	7.8	2.3	1.7	2.9	1.6	Jul-19
Mesirow High Yield	10,070,000	1.0	7.7	0.7	--	--	--	--	--	--	0.7	Aug-19
<i>BBgBarc US Corporate High Yield TR</i>				0.4	1.0	11.0	6.6	6.2	4.9	8.5	0.4	Aug-19
<b>Hedge Funds</b>	<b>62,760,591</b>	<b>6.1</b>	<b>6.1</b>	<b>-0.4</b>	<b>0.2</b>	<b>11.2</b>	<b>1.2</b>	<b>5.6</b>	<b>3.7</b>	<b>--</b>	<b>4.5</b>	<b>Feb-10</b>
<i>HFRI Fund of Funds Composite Index</i>				-0.7	-0.5	5.7	0.3	3.4	2.0	2.9	2.7	Feb-10
ABS Offshore SPC - Global Segregated Portfolio	21,638,916	2.1	34.5	-0.8	0.6	8.5	-1.0	4.8	3.1	--	5.0	Aug-10
<i>HFRI Fund of Funds Composite Index</i>				-0.7	-0.5	5.7	0.3	3.4	2.0	2.9	2.9	Aug-10
Entrust Special Opportunities Fund III, Ltd.	27,352,278	2.6	43.6	0.0	0.0	13.4	2.3	--	--	--	12.2	Oct-16
<i>HFRI Fund of Funds Composite Index</i>				-0.7	-0.5	5.7	0.3	3.4	2.0	2.9	3.4	Oct-16
Old Farm Partners Master Fund, L.P.	4,948,033	0.5	7.9	-1.1	-0.5	5.4	--	--	--	--	-1.0	Oct-18
<i>HFRI Fund of Funds Composite Index</i>				-0.7	-0.5	5.7	0.3	3.4	2.0	2.9	0.5	Oct-18
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	8,821,364	0.9	14.1	0.0	0.0	15.3	--	--	--	--	15.3	Jan-19
<i>HFRI Fund of Funds Composite Index</i>				-0.7	-0.5	5.7	0.3	3.4	2.0	2.9	5.7	Jan-19

Entrust Special Opportunities Fund III, Ltd: Performance and market value is lagged as of June 30, 2019.

EnTrustPermal Special Opportunities Evergreen Fund, Ltd: Performance and market value is lagged as of June 30, 2019.



## Total Retirement Association

As of August 31, 2019

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Real Estate</b>	<b>87,103,195</b>	<b>8.4</b>	<b>8.4</b>	<b>0.1</b>	<b>0.1</b>	<b>5.5</b>	<b>6.8</b>	<b>4.3</b>	<b>--</b>	<b>--</b>	<b>5.1</b>	<b>Jan-16</b>
80% NCREIF ODCE / 20% Wilshire REIT				0.7	1.0	6.5	7.8	7.3	--	--	7.6	Jan-16
<b>Core Real Estate</b>	<b>55,368,376</b>	<b>5.4</b>	<b>63.6</b>	<b>0.2</b>	<b>0.2</b>	<b>5.8</b>	<b>6.8</b>	<b>6.1</b>	<b>--</b>	<b>--</b>	<b>7.1</b>	<b>Jan-16</b>
NCREIF-ODCE				0.0	0.0	2.4	6.4	7.6	9.8	9.9	7.4	Jan-16
Invesco Equity Real Estate Securities Trust Wilshire REIT	816,097	0.1	1.5	4.5 3.3	5.9 5.0	26.6 23.8	15.9 12.0	7.4 5.5	8.6 8.3	12.9 13.5	11.6 10.8	Dec-02 Dec-02
TA Realty Core Property Fund, L.P. NCREIF ODCE	27,153,280	2.6	49.0	0.0 0.0	0.0 0.0	3.9 2.4	7.9 6.4	-- 7.6	-- 9.8	-- 9.9	10.0 6.0	Apr-18 Apr-18
JPMorgan Strategic Property NCREIF-ODCE	27,398,999	2.7	49.5	0.2 0.0	0.2 0.0	-- 2.4	-- 6.4	-- 7.6	-- 9.8	-- 9.9	0.8 1.0	Apr-19 Apr-19
<b>Non-Core Real Estate</b>	<b>31,734,819</b>	<b>3.1</b>	<b>36.4</b>	<b>0.0</b>	<b>0.0</b>	<b>4.7</b>	<b>7.3</b>	<b>-1.4</b>	<b>--</b>	<b>--</b>	<b>-1.2</b>	<b>Jan-16</b>
<b>Private Equity</b>	<b>54,395,389</b>	<b>5.3</b>	<b>5.3</b>	<b>0.0</b>	<b>0.0</b>	<b>1.4</b>	<b>0.5</b>	<b>5.4</b>	<b>--</b>	<b>--</b>	<b>3.6</b>	<b>Jan-16</b>
Cambridge Associates Fund of Funds Composite 1-Quarter Lag				0.0	0.0	2.8	10.6	11.9	10.8	12.2	10.1	Jan-16
<b>Private Equity</b>	<b>47,444,356</b>	<b>4.6</b>	<b>87.2</b>	<b>0.0</b>	<b>0.0</b>	<b>2.5</b>	<b>-0.7</b>	<b>3.9</b>	<b>--</b>	<b>--</b>	<b>2.1</b>	<b>Jan-16</b>
<b>Venture Capital</b>	<b>6,951,033</b>	<b>0.7</b>	<b>12.8</b>	<b>0.0</b>	<b>0.0</b>	<b>-4.0</b>	<b>4.0</b>	<b>9.4</b>	<b>--</b>	<b>--</b>	<b>8.1</b>	<b>Jan-16</b>
<b>Real Assets</b>	<b>50,988,085</b>	<b>4.9</b>	<b>4.9</b>	<b>-0.1</b>	<b>-0.2</b>	<b>1.9</b>	<b>2.1</b>	<b>0.2</b>	<b>--</b>	<b>--</b>	<b>-1.6</b>	<b>Jan-16</b>
CPI + 3%				0.3	0.9	3.4	4.8	5.1	4.5	4.8	5.1	Jan-16
IFM Global Infrastructure CPI+5% (1q Lagged)	21,685,341	2.1	42.5	-0.2 0.0	-0.5 0.0	6.0 3.2	-- --	-- --	-- --	-- --	9.1 4.6	Oct-18 Oct-18
<b>Cash and Cash Equivalent</b>	<b>14,111,233</b>	<b>1.4</b>	<b>1.4</b>									
Cash	14,111,233	1.4	100.0									

Core Real Estate: The market value and performance is one quarter lagged.

Non-Core Real Estate: The market value and performance is one quarter lagged.

Private Equity: The market value and performance is one quarter lagged.

Real Assets: The market value and performance is one quarter lagged.

Invesco REIT, JPMorgan Strategic Property, and IFM Global Infrastructure: Data is as of August 31, 2019.



## Total Retirement Association

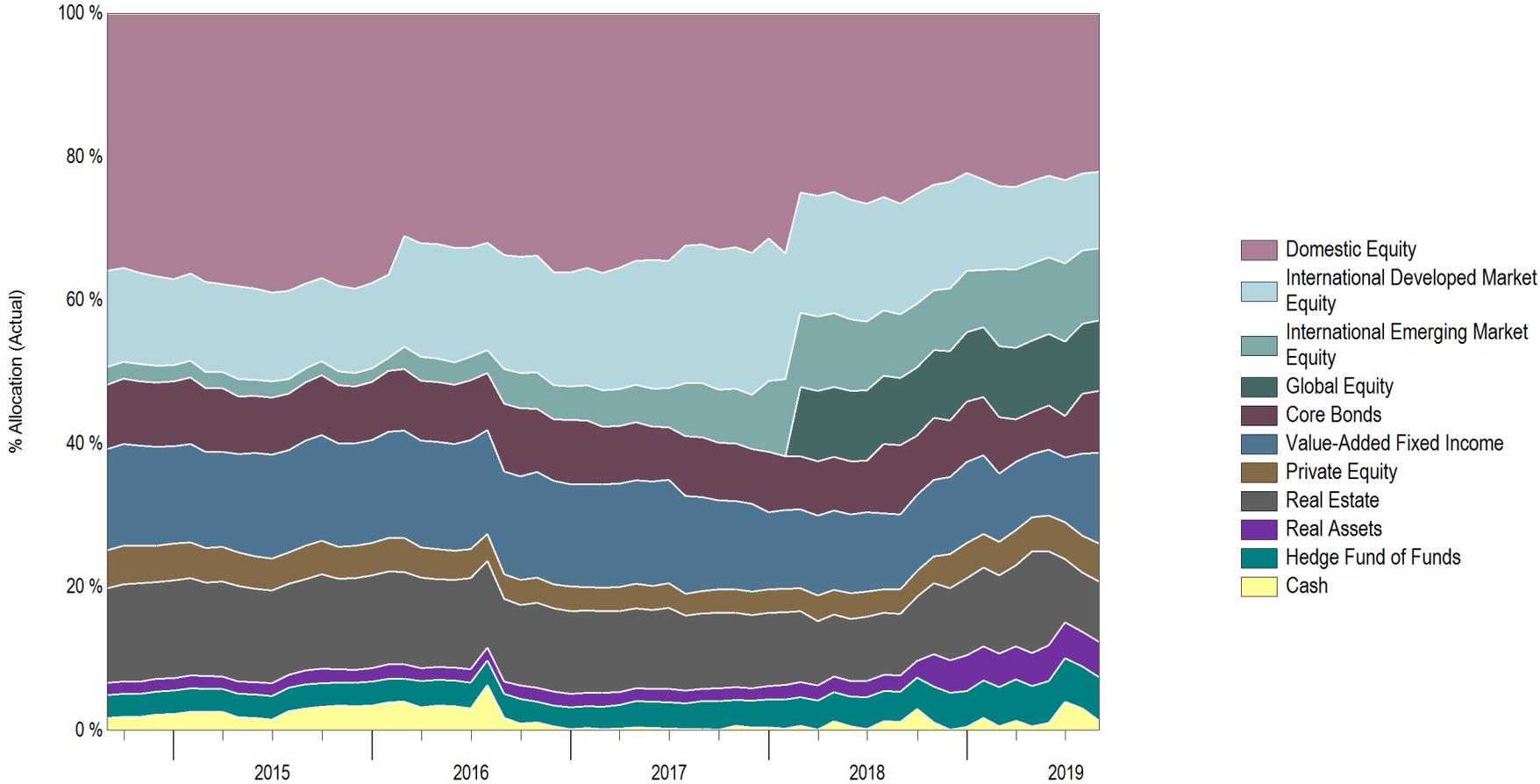
As of August 31, 2019

## Allocation vs. Target

	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?
Domestic Equity	\$228,051,611	22%	26%	21% - 36%	Yes
International Developed Market Equity	\$110,558,491	11%	6%	1% - 16%	Yes
International Emerging Market Equity	\$103,446,065	10%	10%	5% - 20%	Yes
Global Equity	\$102,112,218	10%	10%	5% - 20%	Yes
Core Bonds	\$89,722,399	9%	9%	4% - 14%	Yes
Value-Added Fixed Income	\$130,458,590	13%	6%	2% - 12%	No
Private Equity	\$54,395,389	5%	13%	4% - 18%	Yes
Real Estate	\$87,103,195	8%	10%	5% - 15%	Yes
Real Assets	\$50,988,085	5%	6%	2% - 10%	Yes
Hedge Fund of Funds	\$62,760,591	6%	4%	2% - 8%	Yes
Cash	\$14,111,233	1%	0%	0% - 3%	Yes
<b>Total</b>	<b>\$1,033,707,867</b>	<b>100%</b>	<b>100%</b>		

	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?
Total Equity	\$661,324,365	64%	69%	60% - 80%	Yes
Total Fixed Income	\$220,180,989	21%	15%	5% - 25%	Yes
Total Real Assets and Real Estate	\$138,091,280	13%	16%	13% - 19%	Yes
Cash	\$14,111,233	1%	0%	0% - 3%	Yes

Asset Allocation History  
5 Years Ending August 31, 2019



## Investment Expense Analysis

As of August 31, 2019

## Annual Investment Expense Analysis

As Of August 31, 2019

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
<b>Domestic Equity Assets</b>		<b>\$228,051,611</b>		
Rhumblin Russell 1000 Value	0.05% of First 25.0 Mil, 0.04% of Next 25.0 Mil, 0.03% Thereafter	\$34,891,173	\$16,456	0.05%
Rhumblin Russell 1000 Growth	0.05% of First 25.0 Mil, 0.04% of Next 25.0 Mil, 0.03% Thereafter	\$35,084,579	\$16,534	0.05%
Fisher Midcap Value	0.80% of First 25.0 Mil, 0.75% of Next 25.0 Mil, 0.67% Thereafter	\$42,798,398	\$333,488	0.78%
Boston Company Small Cap Growth	0.45% of Assets	\$50,466,136	\$227,098	0.45%
LMCG Small Cap Value	0.90% of Assets	\$64,788,763	\$583,099	0.90%
<b>International Developed Market Equity Assets</b>		<b>\$110,558,491</b>		
KBI Master Account	0.65% of Assets	\$47,688,431	\$309,975	0.65%
HGK TS International Equity	1.00% of Assets	\$28,797,233	\$287,972	1.00%
Copper Rock International Small Cap	0.85% of Assets	\$34,072,827	\$289,619	0.85%
<b>International Emerging Market Equity Assets</b>		<b>\$103,446,065</b>		
LMCG Emerging Markets	0.64% of Assets	\$46,344,777	\$296,607	0.64%
ABS Emerging Markets	0.35% Management Fee and 10% Performance/Incentive Fee.	\$21,350,946		
Copper Rock Emerging Markets Small Cap	0.85% of Assets	\$10,197,621	\$86,680	0.85%
Driehaus Emerging Markets Growth	0.55% of Assets	\$25,552,721	\$140,540	0.55%
<b>Global Equity Assets</b>		<b>\$102,112,218</b>		
First Eagle Global Value Fund	0.75% of Assets	\$19,854,767	\$148,911	0.75%
Kopernik Global All Cap Fund	0.80% of First 50.0 Mil, 0.75% of Next 150.0 Mil, 0.70% of Next 250.0 Mil, 0.65% of Next 350.0 Mil	\$18,338,549	\$146,708	0.80%
Lee Munder Global Multi-Cap Strategy	0.45% of Assets	\$27,897,142	\$125,537	0.45%
Wellington Durable Enterprises, L.P.	0.60% of Assets	\$36,021,760	\$216,131	0.60%



## Investment Expense Analysis

As of August 31, 2019

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
<b>Core Fixed Income</b>		<b>\$89,722,399</b>		
IR&M Core Bonds	0.25% of First 50.0 Mil, 0.20% of Next 50.0 Mil, 0.15% Thereafter	\$59,456,127	\$143,912	0.24%
Lord Abbett Short Duration Credit Trust II	0.19% of Assets	\$30,266,272	\$57,506	0.19%
<b>Value Added Fixed Income</b>		<b>\$130,458,590</b>		
Eaton Vance High Yield	0.42% of Assets	\$21,807,580	\$91,592	0.42%
THL Bank Loan Select Fund	0.40% of Assets	\$36,385,726	\$145,543	0.40%
Franklin Templeton Emerging Market Bonds	0.99% of Assets	\$31,791,000	\$314,731	0.99%
Manulife Strategic Fixed Income	0.40% of Assets	\$30,404,283	\$121,617	0.40%
Mesirow High Yield	0.40% of Assets	\$10,070,000	\$40,280	0.40%

## Total Retirement Association

As of August 31, 2019

Note: The adjusted value is based on March 31, 2019 FMV adjusted for subsequent cash flows.

Private Equity	Commitment	Total Contributions	Total Distributions	Adjusted Value
Ascend Ventures II, L.P.	2,500,000	2,324,355	925,962	61,532
Ascent Venture Partners IV, L.P.	2,500,000	2,502,219	388,970	40,167
Ascent Venture Partners V, L.P.	5,000,000	5,104,731	3,432,862	4,255,389
Audax Mezzanine Fund IV, L.P.	10,000,000	4,537,168	1,328,097	3,465,317
Charles River Partnership XI, L.P.	1,839,000	1,820,323	1,996,788	145,052
Charlesbank Technology Opportunities Fund, L.P.	12,000,000	0	0	0
DN Partners II, L.P.	5,000,000	2,375,841	0	1,641,786
Euro Choice V, L.P.	5,042,904	5,688,459	2,167,976	5,000,943
FS Equity Partners VIII, L.P.	12,000,000	0	0	0
Globespan Capital Partners V, L.P.	5,000,000	4,852,500	8,008,564	2,593,945
HarbourVest Partners Co-Investment Fund V, L.P.	12,000,000	1,200,000	0	1,200,000
Ironsides Direct Investment Fund V, L.P.	12,000,000	9,444,261	871,982	8,726,286
Landmark Equity Partners XIV, L.P.	6,000,000	6,288,437	6,612,813	1,028,077
Leeds Equity Partners IV, L.P.	5,185,562	5,089,327	6,224,435	10,302
Leeds Equity Partners V, L.P.	2,500,000	3,573,083	3,980,028	2,139,649
Lexington Capital Partners VII, L.P.	10,000,000	10,556,021	12,927,006	2,523,640
LLR Equity Partners V, L.P.	12,000,000	6,240,000	433,003	5,983,057
Mesirow Financial Capital Partners IX, L.P.	4,000,000	3,840,731	1,897,056	223,454
Ridgemont Equity Partners III, L.P.	12,000,000	0	0	0
Rimco Production Company, Inc	2,000,000	2,000,000	7,486,401	1
Searchlight Capital III, L.P.	12,000,000	0	0	0
Siguler Guff Distressed Opportunities Fund III, L.	6,000,000	5,820,000	8,210,296	909,309
Summit Partners Growth Equity Fund IX, L.P.	10,000,000	8,416,000	2,232,746	7,331,852
TRG Growth Partnership II, L.P.	7,500,000	7,450,399	7,463,445	1,181,037
Trilantic Capital Partners VI (North America), L.P.	12,000,000	2,907,130	0	2,765,494
Wellspring Capital Partners VI, L.P.	12,000,000	3,402,317	0	3,169,101
<b>Total Plymouth County - PE</b>	<b>198,067,465</b>	<b>105,433,303</b>	<b>76,588,430</b>	<b>54,395,389</b>



## Total Retirement Association

As of August 31, 2019

Note: The adjusted value is based on March 31, 2019 FMV adjusted for subsequent cash flows.

Real Assets	Commitment	Total Contributions	Total Distributions	Adjusted Value
Basalt Infrastructure Partners II	10,000,000	6,500,879	49,561	6,360,148
BTG Pactual Global Timberland Resources Fund, LLC	4,338,966	5,043,536	229,998	3,043,232
Global Infrastructure Partners III, L.P.	10,000,000	8,343,667	788,954	8,407,375
IFM Global Infrastructure (US), L.P.	20,000,000	20,000,000	119,615	21,685,341
JPMorgan Global Maritime Investment	10,000,000	9,186,014	938,504	6,344,048
Timbervest Partners III, L.P.	5,000,000	5,000,000	1,179,000	5,147,941
<b>Total Plymouth County - RA</b>	<b>59,338,966</b>	<b>54,074,095</b>	<b>3,305,633</b>	<b>50,988,085</b>

Real Estate	Commitment	Total Contributions	Total Distributions	Adjusted Value
1921 Realty, Inc.	5,000,000	5,378,194	0	765,556
AEW Partners Real Estate Fund VIII, L.P.	25,000,000	13,762,297	3,410,486	11,052,620
Berkshire Value Fund V, L.P.	9,000,000	0	0	0
Carlyle Realty Partners VIII, L.P.	18,000,000	2,756,156	1,650	2,309,686
DSF Capital Partners IV, L.P.	5,000,000	5,000,000	5,997,885	16,359
DSF Multi-Family Real Estate Fund III, L.P.	15,000,000	15,499,746	1,229,341	15,344,826
Invesco Equity Real Estate Securities Trust	22,000,000	23,908,825	44,000,000	816,097
JPMorgan Strategic Property	27,000,000	27,000,000	0	27,398,999
New Boston Institutional Fund VII, L.P.	5,000,000	3,012,998	3,961,438	56,763
Real Estate International Partnership Fund I, L.P.	15,000,000	12,674,617	10,772,161	2,189,009
Rockpoint Real Estate Fund VI, L.P.	9,000,000	0	0	0
TA Realty Core Property Fund, L.P.	25,000,000	25,000,000	322,844	27,153,280
<b>Total Plymouth County - RE</b>	<b>180,000,000</b>	<b>133,992,834</b>	<b>69,695,805</b>	<b>87,103,195</b>

Note: The values for Invesco Equity Real Estate Securities Trust, IFM Global Infrastructure and JPMorgan Strategic Property are as of August 31, 2019.



## **Passive RFP Respondent Review**

## Background

- In September 2019, Meketa Investment Group issued an RFP for passive index mandates on behalf of the Association.
  - Large Cap U.S. Growth and Value equity
    - RhumbLine currently manages these mandates (Russell 1000 Value and Growth indexes) for the Association.
  - International Developed Market Equity
  - REITS
  - Investment Grade Bonds
  - TIPS
- Meketa Investment Group received three responses from investment managers.
  - This number of responses is average for index mandates.
- The results of our review of responses are listed on the following pages.

### RFP Respondents

Manager	Headquarters	Overall Rating
RhumbLine	Boston, MA	Highly Advantageous
State Street Global Advisors	Boston, MA	Highly Advantageous
Mellon Investments	Boston, MA	Advantageous

### Strategy Availability

Manager	RhumbLine	SSGA	Mellon
Large Cap U.S. Equity Growth	Commingled (Non-Lending)	Commingled (Lending & Non-Lending)	Commingled (Lending & Non-Lending)
Large Cap U.S. Equity Value	Commingled (Non-Lending)	Commingled (Lending & Non-Lending)	Commingled (Lending & Non-Lending)
International Developed Equity	Commingled (Non-Lending)	Commingled (Lending & Non-Lending)	Commingled (Lending & Non-Lending)
US Investment Grade Bonds	Commingled (Non-Lending)	Commingled (Lending & Non-Lending)	Commingled (Lending & Non-Lending)
US TIPS	Commingled (Non-Lending)	Commingled (Lending & Non-Lending)	Commingled (Lending & Non-Lending)
REITS	Commingled (Non-Lending) Benchmark: FTSE NAREIT All Eq. REIT	Commingled (Non-Lending) Benchmark: MSCI US REIT	Commingled (Lending & Non-Lending) Benchmark: DJ US Select REIT

- While all managers have the capability to manage separate accounts on behalf of the System, the costs and regulatory complexity of running separate accounts make commingled funds a more suitable option.

### RhumbLine

Rating Criteria	Rating	Rationale
Overall	Highly Advantageous	
Organization	Highly Advantageous	<ul style="list-style-type: none"> <li>• RhumbLine is a 100% employee-owned firm established in 1992 to concentrate solely on managing passively managed strategies. It is a majority women-/minority-owned firm (53%).</li> <li>• RhumbLine has made a dedicated effort to remove conflicts of interest from its business model – it does not engage in ancillary businesses such as securities lending.</li> <li>• RhumbLine currently manages index mandates for Massachusetts public retirement systems.</li> </ul>
Team	Advantageous	<ul style="list-style-type: none"> <li>• The investment team is led by Alex Ryer. Mr. Ryer has spent his entire career in passive management, starting his career at SSGA in 2000, working for RhumbLine as a portfolio manager from 2003-2005, and then following up with stints at both Northern Trust and BlackRock in quantitative research before returning to RhumbLine in 2016. He is supported by portfolio managers Julie Lind and Jeff Kusmierz, each with over 15 years and 10 years of experience with the company, respectively.</li> <li>• Investment team turnover has been extremely low, with the departure of former CIO Norm Meltz (retirement) in 2017, representing the first significant departure in a decade.</li> </ul>
Investment Philosophy & Process	Advantageous	<ul style="list-style-type: none"> <li>• RhumbLine’s investment approach is determined by a number of factors including mandate size, benchmark, client restrictions, and trading cost. All of the fixed income strategies are likely to be optimized.</li> <li>• RhumbLine’s trading approach is extremely cost-focused; the firm will continuously evaluate reductions in tracking error versus trading cost, at times incurring additional tracking error to avoid absolute losses.</li> </ul>
Performance	Advantageous	<ul style="list-style-type: none"> <li>• Index dispersion is reasonable with differences from the index being minimal.</li> <li>• While not the lowest amongst its peers, RhumbLine’s tracking error for its strategies is reasonable, with equity tracking performing better than fixed income tracking. Notably, tracking error tends to rise as a result of steps to reduce costs versus the index (i.e., its “good” tracking error).</li> </ul>
Fees	Highly Advantageous	<ul style="list-style-type: none"> <li>• Aggregate relationship fee proposed of 0.04% of the first \$50mm of assets and 0.03% thereafter.</li> <li>• Effective fee if all strategies funded: 0.037%</li> <li>• Effective fee with current strategies: 0.036%</li> </ul>

### State Street Global Advisors (SSGA)

Rating Criteria	Rating	Rationale
Overall	Highly Advantageous	
Organization	Advantageous	<ul style="list-style-type: none"> <li>State Street Global Advisors is the investment management division of State Street Corporation (NYSE: STT); a large, publicly- traded financial services and bank holding company. The firm is headquartered in Boston, MA.</li> <li>State Street manages \$2.9 trillion in assets across a range of passive, enhanced index, and active investment products across asset classes.</li> <li>SSGA currently manages index mandates for Massachusetts public retirement systems.</li> </ul>
Team	Advantageous	<ul style="list-style-type: none"> <li>SSGA's indexing teams are broadly broken down into equity and fixed income beta groups. The teams tend to be composed of a mixture of internal and external hires to allow for employees with strong operational knowledge to contribute, while also incorporating new approaches. Global Equity Beta is led by Lynn Blake, a 20+ year State Street veteran with significant experience in all aspects of index management.</li> <li>Team turnover has been moderate and in line with industry peers.</li> </ul>
Investment Philosophy & Process	Highly Advantageous	<ul style="list-style-type: none"> <li>SSGA attempts to minimize tracking error versus the benchmark subject to implementation costs across all of its strategies. Most equity strategies utilize replication to construct the portfolio while most fixed income strategies (with the arguable exclusion of TIPS) are based on optimized sampling methods.</li> <li>A key differentiator for SSGA is its ability to “cross trade” a significant portion of its trading volume. State Street’s asset management, custodial, and broker/dealer clients provide a pool of liquidity with each other to trade securities with minimal transaction costs and significantly lowered tracking error. While the impact of cross trading is stronger in equities, SSGA retains the ability to cross trade fixed income securities as well, where appropriate.</li> </ul>
Performance	Highly Advantageous	<ul style="list-style-type: none"> <li>Performance is consistent with the underlying benchmarks.</li> <li>5-year tracking error for all strategies is very low compared to industry peers.</li> </ul>
Fees	Advantageous	<ul style="list-style-type: none"> <li>US Equity and fixed income strategies: 0.04% flat, International developed equity: 0.06% flat, REITS: 0.08% flat</li> <li>Effective fee if all strategies funded: 0.043%</li> <li>Effective fee with current strategies: 0.04%</li> </ul>

### Mellon Investments

Rating Criteria	Rating	Rationale
Overall	Advantageous	
Organization	Advantageous	<ul style="list-style-type: none"> <li>• Mellon Investments is the investment management division of Bank of New York Mellon (NYSE: BK), a large, publicly traded financial services and bank holding company. While the parent is headquartered in New York City, the asset management unit operates from Boston, MA.</li> <li>• Mellon manages \$524.6 billion in assets across a range of asset classes. Index mandates make up approximately 60% of overall firm assets.</li> <li>• Mellon Investments manages mandates for Massachusetts public retirement systems</li> </ul>
Team	Advantageous	<ul style="list-style-type: none"> <li>• Karen Wong, a 20-year indexing veteran with most of that time spent at Mellon, heads the firm's index management and is supported by dedicated equity, fixed income, and factor-based management teams.</li> <li>• Team turnover has been fairly stable, with no particularly recent additions and only a handful (3) of relevant departures.</li> </ul>
Investment Philosophy & Process	Advantageous	<ul style="list-style-type: none"> <li>• Mellon balances low tracking error against transaction costs to determine whether they will fully replicate the target index or employ a sampling approach. For the relevant mandates in this search, Mellon replicates all mandates with the exception of US investment grade bonds, which uses stratified sampling.</li> </ul>
Performance	Highly Advantageous	<ul style="list-style-type: none"> <li>• Tracking error is reasonable and consistent with industry peers.</li> <li>• Index dispersion is moderate and consistent with peers for the relevant asset classes.</li> </ul>
Fees	Advantageous	<ul style="list-style-type: none"> <li>• Securities Lending: US Equity: 0.04% on first \$50mm, Investment Grade Bonds: 0.05% first \$50mm, TIPS 0.03% first \$50mm, International developed equity: 0.06% first \$50mm, REITS: 0.08% flat</li> <li>• Securities Lending: US Equity: 0.05% on first \$50mm, Investment Grade Bonds: 0.06% first \$50mm, TIPS 0.035% first \$50mm, International developed equity: 0.08% first \$50mm, REITS: 0.010% flat</li> <li>• Effective fee if all strategies funded: 0.043% (Lending) / 0.054% (Non-Lending)</li> <li>• Effective fee with current strategies: 0.04% (Lending) / 0.05% (Non-Lending)</li> </ul>

## Summary

- Based upon our review and evaluation of each respondent, Meketa Investment Group has rated RhumbLine and SSGA as highly advantageous.
  - If the Board wishes to participate in securities lending, we would recommend interviewing both SSGA and Mellon, as RhumbLine does not offer lending in its commingled vehicles.

# Appendices

## **Disclaimer, Glossary, and Notes**

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE "RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

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CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE "FORWARD - LOOKING STATEMENTS," WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS "MAY," "WILL," "SHOULD," "EXPECT," "AIM," "ANTICIPATE," "TARGET," "PROJECT," "ESTIMATE," "INTEND," "CONTINUE" OR "BELIEVE," OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

**Credit Risk:** Refers to the risk that the issuer of a fixed income security may default (i.e., the issuer will be unable to make timely principal and/or interest payments on the security.)

**Duration:** Measure of the sensitivity of the price of a bond to a change in its yield to maturity. Duration summarizes, in a single number, the characteristics that cause bond prices to change in response to a change in interest rates. For example, the price of a bond with a duration of three years will rise by approximately 3% for each 1% decrease in its yield to maturity. Conversely, the price will decrease 3% for each 1% increase in the bond's yield. Price changes for two different bonds can be compared using duration. A bond with a duration of six years will exhibit twice the percentage price change of a bond with a three-year duration. The actual calculation of a bond's duration is somewhat complicated, but the idea behind the calculation is straightforward. The first step is to measure the time interval until receipt for each cash flow (coupon and principal payments) from a bond. The second step is to compute a weighted average of these time intervals. Each time interval is measured by the present value of that cash flow. This weighted average is the duration of the bond measured in years.

**Information Ratio:** This statistic is a measure of the consistency of a portfolio's performance relative to a benchmark. It is calculated by subtracting the benchmark return from the portfolio return (excess return), and dividing the resulting excess return by the standard deviation (volatility) of this excess return. A positive information ratio indicates outperformance versus the benchmark, and the higher the information ratio, the more consistent the outperformance.

**Jensen's Alpha:** A measure of the average return of a portfolio or investment in excess of what is predicted by its beta or "market" risk.  $\text{Portfolio Return} - [\text{Risk Free Rate} + \text{Beta} * (\text{market return} - \text{Risk Free Rate})]$ .

**Market Capitalization:** For a firm, market capitalization is the total market value of outstanding common stock. For a portfolio, market capitalization is the sum of the capitalization of each company weighted by the ratio of holdings in that company to total portfolio holdings; thus it is a weighted-average capitalization. Meketa Investment Group considers the largest 65% of the broad domestic equity market as large capitalization, the next 25% of the market as medium capitalization, and the smallest 10% of stocks as small capitalization.

**Market Weighted:** Stocks in many indices are weighted based on the total market capitalization of the issue. Thus, the individual returns of higher market-capitalization issues will more heavily influence an index's return than the returns of the smaller market-capitalization issues in the index.

**Maturity:** The date on which a loan, bond, mortgage, or other debt/security becomes due and is to be paid off.

**Prepayment Risk:** The risk that prepayments will increase (homeowners will prepay all or part of their mortgage) when mortgage interest rates decline; hence, investors' monies will be returned to them in a lower interest rate environment. Also, the risk that prepayments will slow down when mortgage interest rates rise; hence, investors will not have as much money as previously anticipated in a higher interest rate environment. A prepayment is any payment in excess of the scheduled mortgage payment.

**Price-Book Value (P/B) Ratio:** The current market price of a stock divided by its book value per share. Meketa Investment Group calculates P/B as the current price divided by Compustat's quarterly common equity. Common equity includes common stock, capital surplus, retained earnings, and treasury stock adjusted for both common and nonredeemable preferred stock. Similar to high P/E stocks, stocks with high P/B's tend to be riskier investments.

**Price-Earnings (P/E) Ratio:** A stock's market price divided by its current or estimated future earnings. Lower P/E ratios often characterize stocks in low growth or mature industries, stocks in groups that have fallen out of favor, or stocks of established blue chip companies with long records of stable earnings and regular dividends. Sometimes a company that has good fundamentals may be viewed unfavorably by the market if it is an industry that is temporarily out of favor. Or a business may have experienced financial problems causing investors to be skeptical about its future. Either of these situations would result in lower relative P/E ratios. Some stocks exhibit above-average sales and earnings growth or expectations for above average growth. Consequently, investors are willing to pay more for these companies' earnings, which results in elevated P/E ratios. In other words, investors will pay more for shares of companies whose profits, in their opinion, are expected to increase faster than average. Because future events are in no way assured, high P/E stocks tend to be riskier and more volatile investments. Meketa Investment Group calculates P/E as the current price divided by the I/B/E/S consensus of twelve-month forecast earnings per share.

**Quality Rating:** The rank assigned a security by such rating services as Fitch, Moody's, and Standard & Poor's. The rating may be determined by such factors as (1) the likelihood of fulfillment of dividend, income, and principal payment of obligations; (2) the nature and provisions of the issue; and (3) the security's relative position in the event of liquidation of the company. Bonds assigned the top four grades (AAA, AA, A, BBB) are considered investment grade because they are eligible bank investments as determined by the controller of the currency.

**Sharpe Ratio:** A commonly used measure of risk-adjusted return. It is calculated by subtracting the risk free return (usually three-month Treasury bill) from the portfolio return and dividing the resulting excess return by the portfolio's total risk level (standard deviation). The result is a measure of return per unit of total risk taken. The higher the Sharpe ratio, the better the fund's historical risk adjusted performance.

**Standard Deviation:** A measure of the total risk of an asset or a portfolio. Standard deviation measures the dispersion of a set of numbers around a central point (e.g., the average return). If the standard deviation is small, the distribution is concentrated within a narrow range of values. For a normal distribution, about two thirds of the observations will fall within one standard deviation of the mean, and 95% of the observations will fall within two standard deviations of the mean.

**STIF Account:** Short-term investment fund at a custodian bank that invests in cash-equivalent instruments. It is generally used to safely invest the excess cash held by portfolio managers.

**Style:** The description of the type of approach and strategy utilized by an investment manager to manage funds. For example, the style for equities is determined by portfolio characteristics such as price-to-book value, price-to-earnings ratio, and dividend yield. Equity styles include growth, value, and core.

**Yield to Maturity:** The yield, or return, provided by a bond to its maturity date; determined by a mathematical process, usually requiring the use of a “basis book.” For example, a 5% bond pays \$5 a year interest on each \$100 par value. To figure its current yield, divide \$5 by \$95—the market price of the bond—and you get 5.26%. Assume that the same bond is due to mature in five years. On the maturity date, the issuer is pledged to pay \$100 for the bond that can be bought now for \$95. In other words, the bond is selling at a discount of 5% below par value. To figure yield to maturity, a simple and approximate method is to divide 5% by the five years to maturity, which equals 1% pro rata yearly. Add that 1% to the 5.26% current yield, and the yield to maturity is roughly 6.26%.

$$\frac{5\% \text{ (discount)}}{5 \text{ (yrs. to maturity)}} = 1\% \text{ pro rata, plus } 5.26\% \text{ (current yield)} = 6.26\% \text{ (yield to maturity)}$$

Sources: [Investment Terminology](#), International Foundation of Employee Benefit Plans, 1999.  
[The Handbook of Fixed Income Securities](#), Fabozzi, Frank J., 1991.

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Throughout this report, numbers may not sum due to rounding.

Returns for periods greater than one year are annualized throughout this report.

Values shown are in millions of dollars, unless noted otherwise.