

# FUND EVALUATION REPORT

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## Worcester Retirement System

Quarterly Review  
September 30, 2018



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BOSTON  
MASSACHUSETTS

CHICAGO  
ILLINOIS

MIAMI  
FLORIDA

PORTLAND  
OREGON

SAN DIEGO  
CALIFORNIA

LONDON  
UNITED KINGDOM

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# Third Quarter 2018 Performance Review

## **Retirement System Summary**

PRIT Look Through Analysis  
Aggregate Assets  
As of September 30 2018

	Actual Asset Allocation <sup>1,2</sup> (%)	PRIT Actual Asset Allocation <sup>1</sup> (%)
<b>Total Retirement System</b>	<b>NA</b>	<b>NA</b>
Global Equity Assets	47	42
<i>Domestic Equity Assets</i>	22	20
<i>International Developed Market Equity Assets</i>	15	16
<i>International Emerging Market Equity Assets</i>	10	6
Fixed Income Assets	21	20
<i>Core Fixed Income Assets<sup>3</sup></i>	13	12
<i>Value-Added Fixed Income Assets<sup>4</sup></i>	8	8
Real Estate Assets	10	9
Private Equity Assets	9	11
Portfolio Completion Strategies / Hedge Funds / GTAA	3	13
Real Assets (Natural Resources, Timber, Infrastructure)	8	4
Cash	<1	1

<sup>1</sup> Numbers may not sum to 100% due to rounding.

<sup>2</sup> Asset classes include a pro-rata allocation of the System's 26% holding of the PRIT Core Fund.

<sup>3</sup> Retirement System figures include investment grade bonds and TIPS.

<sup>4</sup> Retirement System figures include high yield fixed income and emerging market debt.



Worcester Retirement System  
Retirement System Summary

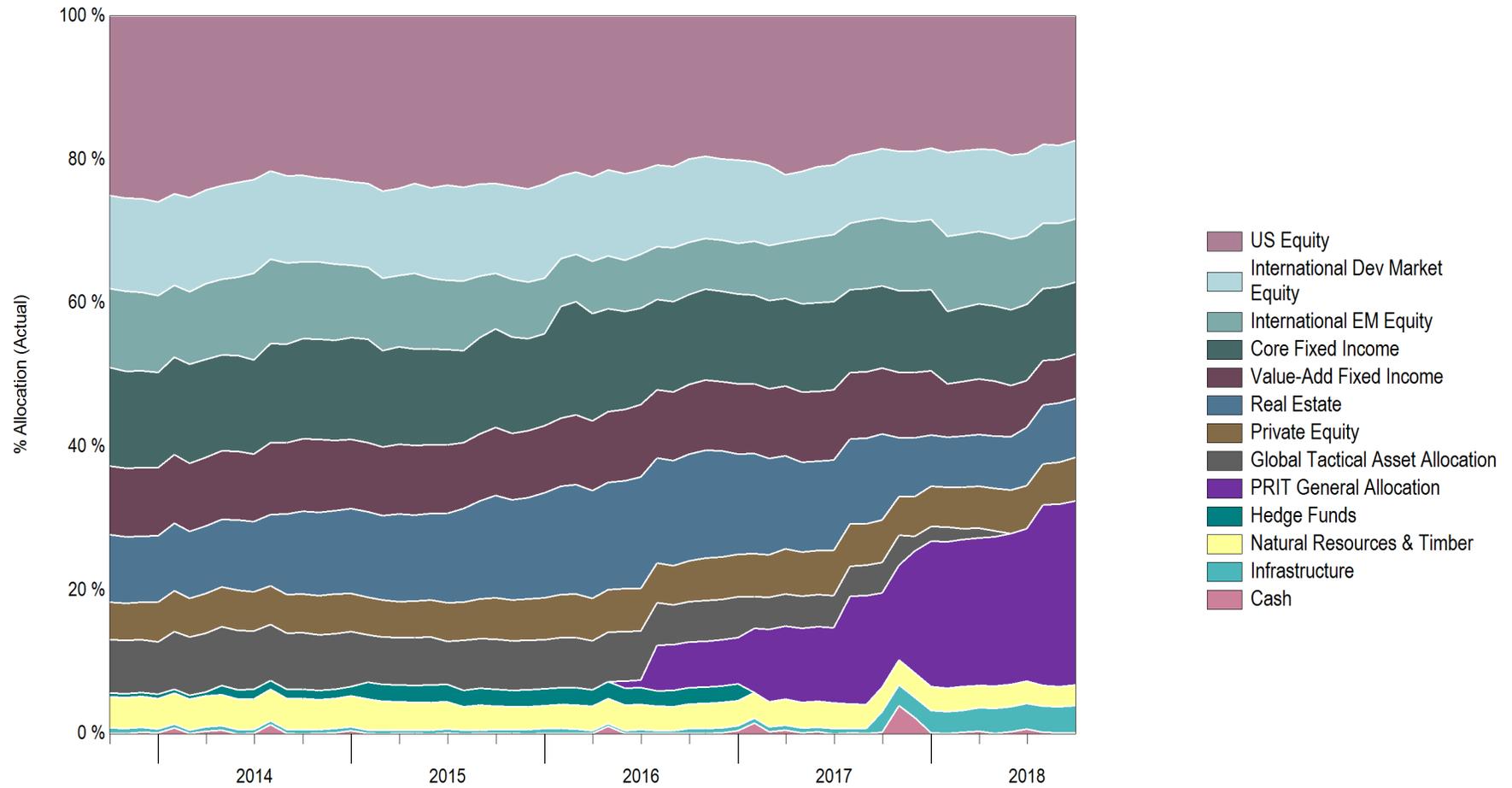
As of September 30, 2018

**Allocation vs. Policy Targets**

	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?
US Equity	\$170,568,332	17%	14%	9% - 19%	Yes
International Dev Market Equity	\$107,595,400	11%	8%	4% - 12%	Yes
International EM Equity	\$86,516,175	9%	8%	4% - 12%	Yes
Core Fixed Income	\$98,351,384	10%	10%	5% - 15%	Yes
Value-Add Fixed Income	\$60,954,733	6%	4%	2% - 6%	No
Real Estate	\$80,742,970	8%	6%	4% - 8%	No
Private Equity	\$59,829,501	6%	7%	4% - 10%	Yes
PRIT General Allocation	\$251,804,210	26%	35%	0% - 50%	Yes
Natural Resources & Timber	\$28,506,027	3%	3%	1% - 5%	Yes
Infrastructure	\$37,491,983	4%	5%	2% - 8%	Yes
Cash	\$1,141,316	0%	0%	0% - 5%	Yes
<b>Total</b>	<b>\$983,502,033</b>	<b>100%</b>	<b>100%</b>		



Asset Allocation History  
 5 Years Ending September 30, 2018



Worcester Retirement System  
Retirement System Summary

As of September 30, 2018

**Asset Class Performance Summary**

	Market Value (\$)	% of Portfolio	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total Retirement System</b>	<b>983,502,033</b>	<b>100.0</b>	<b>2.6</b>	<b>3.1</b>	<b>7.1</b>	<b>9.9</b>	<b>6.9</b>	<b>7.0</b>	<b>7.6</b>	<b>Oct-95</b>
<b>Total Retirement System (Net of Fees)</b>			<b>2.5</b>	<b>3.1</b>	<b>7.0</b>	<b>9.7</b>	<b>6.8</b>	<b>6.8</b>	<b>7.4</b>	
<i>Custom Benchmark - Target Allocation</i>			2.2	2.4	6.4	9.6	7.1	7.4	--	Oct-95
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>			2.2	1.4	5.3	8.8	5.5	6.3	6.2	Oct-95
<b>Domestic Equity Assets</b>	<b>170,568,332</b>	<b>17.3</b>	<b>7.0</b>	<b>10.1</b>	<b>17.2</b>	<b>17.0</b>	<b>13.4</b>	<b>12.1</b>	<b>6.7</b>	<b>Aug-00</b>
<i>Russell 3000</i>			7.1	10.6	17.6	17.1	13.5	12.0	6.4	Aug-00
<b>International Developed Market Equity</b>	<b>107,595,400</b>	<b>10.9</b>	<b>1.1</b>	<b>-1.2</b>	<b>3.5</b>	<b>10.8</b>	<b>5.9</b>	<b>7.0</b>	<b>5.4</b>	<b>Aug-00</b>
<i>MSCI EAFE</i>			1.4	-1.4	2.7	9.2	4.4	5.4	3.8	Aug-00
<b>International Emerging Market Equity</b>	<b>86,516,175</b>	<b>8.8</b>	<b>-1.6</b>	<b>-7.9</b>	<b>-1.8</b>	<b>14.8</b>	<b>4.1</b>	<b>6.3</b>	<b>7.0</b>	<b>Aug-06</b>
<i>MSCI Emerging Markets</i>			-1.1	-7.7	-0.8	12.4	3.6	5.4	5.2	Aug-06
<b>Core Fixed Income</b>	<b>98,351,384</b>	<b>10.0</b>	<b>-0.2</b>	<b>-1.1</b>	<b>-0.7</b>	<b>1.7</b>	<b>1.7</b>	<b>4.1</b>	<b>4.1</b>	<b>May-05</b>
<i>Custom Benchmark - Fixed Income</i>			-0.1	-1.2	-0.8	1.4	1.8	3.4	3.6	May-05
<b>Value Added Fixed Income</b>	<b>60,954,733</b>	<b>6.2</b>	<b>1.0</b>	<b>-0.9</b>	<b>0.2</b>	<b>6.0</b>	<b>3.8</b>	<b>6.3</b>	<b>7.0</b>	<b>May-05</b>
<i>Custom High Yield Benchmark</i>			1.6	0.4	1.3	6.5	4.0	--	--	May-05
<b>Real Estate</b>	<b>80,742,970</b>	<b>8.2</b>	<b>1.7</b>	<b>6.7</b>	<b>9.1</b>	<b>8.9</b>	<b>10.2</b>	<b>6.3</b>	<b>7.8</b>	<b>Oct-00</b>
<i>NCREIF ODCE</i>			2.1	6.5	8.7	8.8	10.7	5.6	8.1	Oct-00
<b>Private Equity</b>	<b>59,829,501</b>	<b>6.1</b>	<b>3.9</b>	<b>8.8</b>	<b>16.2</b>	<b>9.3</b>	<b>9.1</b>	<b>6.6</b>	<b>9.4</b>	<b>Oct-00</b>
<i>Cambridge Associates Fund of Funds Composite 1-Quarter Lag</i>			4.0	12.7	16.5	9.8	12.5	8.3	5.2	Oct-00
<b>PRIT General Allocation</b>	<b>251,804,210</b>	<b>25.6</b>	<b>2.7</b>	<b>4.2</b>	<b>8.2</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>11.2</b>	<b>Jun-16</b>
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>			2.2	1.4	5.3	8.8	5.5	6.3	8.6	Jun-16
<b>Real Assets</b>	<b>65,998,010</b>	<b>6.7</b>	<b>4.1</b>	<b>7.9</b>	<b>10.6</b>	<b>11.0</b>	<b>5.6</b>	<b>3.9</b>	<b>4.0</b>	<b>Oct-06</b>
<i>CPI+3%</i>			1.2	3.9	5.3	5.0	4.5	4.4	4.8	Oct-06
<b>Cash</b>	<b>1,141,316</b>	<b>0.1</b>								

Custom Benchmark - Fixed Income is comprised of 70% Barclays US Aggregate Index and 30% Barclays 1-10 Year TIPS Index.

Custom High Yield Benchmark is comprised of one third Barclays High Yield Index, one third Credit Suisse Leveraged Loans Index, and the final third being split evenly between JPMorgan's Emerging Market Bond Index and Emerging Markets Government Bond Index.



## Retirement System Summary

As of September 30, 2018

## Trailing Performance

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total Retirement System</b>	<b>983,502,033</b>	<b>100.0</b>	<b>--</b>	<b>2.6</b>	<b>3.1</b>	<b>7.1</b>	<b>9.9</b>	<b>6.9</b>	<b>7.0</b>	<b>7.6</b>	<b>Oct-95</b>
<b>Total Retirement System (Net of Fees)</b>				<b>2.5</b>	<b>3.1</b>	<b>7.0</b>	<b>9.7</b>	<b>6.8</b>	<b>6.8</b>	<b>7.4</b>	
<i>Custom Benchmark - Target Allocation</i>				2.2	2.4	6.4	9.6	7.1	7.4	--	Oct-95
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>				2.2	1.4	5.3	8.8	5.5	6.3	6.2	Oct-95
<b>Domestic Equity Assets</b>	<b>170,568,332</b>	<b>17.3</b>	<b>17.3</b>	<b>7.0</b>	<b>10.1</b>	<b>17.2</b>	<b>17.0</b>	<b>13.4</b>	<b>12.1</b>	<b>6.7</b>	<b>Aug-00</b>
<i>Russell 3000</i>				7.1	10.6	17.6	17.1	13.5	12.0	6.4	Aug-00
SSgA S&P 500 Index (Net of Fees)	62,694,962	6.4	36.8	7.7	10.6	17.9	17.4	14.0	12.0	6.9	Aug-98
<i>S&amp;P 500</i>				7.7	10.6	17.9	17.3	13.9	12.0	6.9	Aug-98
<i>Large Cap MStar MF Median</i>				7.0	9.2	16.4	15.6	12.4	11.4	7.0	Aug-98
<i>Large Cap MStar MF Rank</i>				27	37	36	28	26	36	54	Aug-98
SSgA Russell 1000 Growth Index (Net of Fees)	44,894,116	4.6	26.3	9.2	17.0	26.2	20.5	16.6	--	16.6	Nov-09
<i>Russell 1000 Growth</i>				9.2	17.1	26.3	20.6	16.6	14.3	16.6	Nov-09
<i>Large Growth MStar MF Median</i>				7.7	16.1	23.9	18.6	14.8	12.9	15.3	Nov-09
<i>Large Growth MStar MF Rank</i>				17	44	34	16	19	--	18	Nov-09
SSgA Russell 1000 Value Index (Net of Fees)	40,442,236	4.1	23.7	5.7	3.9	9.5	13.6	10.8	9.9	7.7	Jul-05
<i>Russell 1000 Value</i>				5.7	3.9	9.5	13.6	10.7	9.8	7.6	Jul-05
<i>Large Value MStar MF Median</i>				5.6	4.4	11.0	13.5	10.4	10.0	7.9	Jul-05
<i>Large Value MStar MF Rank</i>				49	58	62	48	40	57	56	Jul-05
SSgA S&P Midcap 400 Index (Net of Fees)	9,768,769	1.0	5.7	3.9	7.5	14.2	15.7	11.9	12.5	10.2	Sep-06
<i>S&amp;P 400 MidCap</i>				3.9	7.5	14.2	15.7	11.9	12.5	10.2	Sep-06
<i>Mid Cap MStar MF Median</i>				4.5	7.3	13.7	14.4	11.0	11.7	9.1	Sep-06
<i>Mid Cap MStar MF Rank</i>				59	47	44	32	30	24	25	Sep-06
Lee Munder Small Cap Value (Net of Fees)	12,768,249	1.3	7.5	1.8	5.3	8.5	15.3	10.9	--	13.4	Nov-09
<i>Russell 2000 Value</i>				1.6	7.1	9.3	16.1	9.9	9.5	13.3	Nov-09
<i>Small Value MStar MF Median</i>				1.2	4.6	7.5	13.4	9.3	10.4	13.0	Nov-09
<i>Small Value MStar MF Rank</i>				29	45	38	18	13	--	42	Nov-09

## Retirement System Summary

As of September 30, 2018

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>International Developed Market Equity</b>	<b>107,595,400</b>	<b>10.9</b>	<b>10.9</b>	<b>1.1</b>	<b>-1.2</b>	<b>3.5</b>	<b>10.8</b>	<b>5.9</b>	<b>7.0</b>	<b>5.4</b>	<b>Aug-00</b>
MSCI EAFE				1.4	-1.4	2.7	9.2	4.4	5.4	3.8	Aug-00
SSgA MSCI EAFE Index	82,178,836	8.4	76.4	1.4	-1.1	3.1	9.6	4.7	5.6	6.3	Sep-04
MSCI EAFE				1.4	-1.4	2.7	9.2	4.4	5.4	5.9	Sep-04
Foreign MStar MF Median				0.4	-2.6	1.8	9.2	4.9	5.9	6.4	Sep-04
Foreign MStar MF Rank				23	28	31	46	54	56	57	Sep-04
Acadian Non-U.S. Small Cap Equity (Net of Fees)	25,416,564	2.6	23.6	0.0	-2.2	3.7	14.4	10.2	10.9	8.8	Feb-05
MSCI EAFE Small Cap				-0.9	-2.2	3.7	12.4	8.0	9.7	7.1	Feb-05
eV EAFE Small Cap Core Net Median				-1.3	-4.6	1.3	12.0	8.2	10.7	8.5	Feb-05
eV EAFE Small Cap Core Net Rank				29	27	32	18	11	24	39	Feb-05
<b>International Emerging Market Equity</b>	<b>86,516,175</b>	<b>8.8</b>	<b>8.8</b>	<b>-1.6</b>	<b>-7.9</b>	<b>-1.8</b>	<b>14.8</b>	<b>4.1</b>	<b>6.3</b>	<b>7.0</b>	<b>Aug-06</b>
MSCI Emerging Markets				-1.1	-7.7	-0.8	12.4	3.6	5.4	5.2	Aug-06
PRIT Emerging Markets (Net of Fees)	86,516,175	8.8	100.0	-1.6	-7.9	-1.8	--	--	--	11.7	Sep-16
MSCI Emerging Markets				-1.1	-7.7	-0.8	12.4	3.6	5.4	10.5	Sep-16
eV Emg Mkts Equity Net Median				-3.0	-9.5	-3.2	11.2	3.7	6.0	8.9	Sep-16
eV Emg Mkts Equity Net Rank				36	29	32	--	--	--	18	Sep-16
<b>Core Fixed Income</b>	<b>98,351,384</b>	<b>10.0</b>	<b>10.0</b>	<b>-0.2</b>	<b>-1.1</b>	<b>-0.7</b>	<b>1.7</b>	<b>1.7</b>	<b>4.1</b>	<b>4.1</b>	<b>May-05</b>
Custom Benchmark - Fixed Income				-0.1	-1.2	-0.8	1.4	1.8	3.4	3.6	May-05
IR&M Aggregate Bond	63,065,166	6.4	64.1	0.0	-1.6	-1.2	1.7	--	--	2.4	Feb-14
BBgBarc US Aggregate TR				0.0	-1.6	-1.2	1.3	2.2	3.8	2.0	Feb-14
Intermediate-Term Bond MStar MF Median				0.2	-1.3	-1.0	1.8	2.3	4.6	2.1	Feb-14
Intermediate-Term Bond MStar MF Rank				82	68	60	53	--	--	33	Feb-14
IR&M Intermediate TIPS	35,286,219	3.6	35.9	-0.4	-0.2	0.3	1.6	--	--	1.0	Feb-14
BBgBarc US TIPS 1-10 Yr TR				-0.4	-0.2	0.3	1.6	0.9	2.5	1.0	Feb-14
Inflation-Protected Bond MStar MF Median				-0.5	-0.7	0.5	1.9	1.0	3.0	1.1	Feb-14
Inflation-Protected Bond MStar MF Rank				45	30	67	69	--	--	60	Feb-14

## Retirement System Summary

As of September 30, 2018

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Value Added Fixed Income</b>	<b>60,954,733</b>	<b>6.2</b>	<b>6.2</b>	<b>1.0</b>	<b>-0.9</b>	<b>0.2</b>	<b>6.0</b>	<b>3.8</b>	<b>6.3</b>	<b>7.0</b>	<b>May-05</b>
<i>Custom High Yield Benchmark</i>				1.6	0.4	1.3	6.5	4.0	--	--	May-05
High Yield Bonds	23,806,567	2.4	39.1	1.8	2.4	3.3	6.0	4.5	7.2	6.2	Jun-08
<i>50% BBgBarc US High Yield/ 50% Credit Suisse Leveraged Loans</i>				2.2	3.5	4.3	6.8	5.0	7.7	6.7	Jun-08
Loomis Sayles High Yield	12,761,160	1.3	53.6	2.1	1.8	2.5	7.6	5.6	9.4	8.0	Jan-96
<i>BBgBarc US High Yield TR</i>				2.4	2.6	3.0	8.1	5.5	9.5	7.1	Jan-96
<i>eV US High Yield Fixed Inc Gross Median</i>				2.3	2.5	3.2	7.3	5.4	8.9	7.6	Jan-96
<i>eV US High Yield Fixed Inc Gross Rank</i>				64	78	74	44	35	23	30	Jan-96
Loomis Sayles Bank Loans	11,045,407	1.1	46.4	1.4	3.2	4.2	4.3	3.9	5.3	4.3	Oct-05
<i>Credit Suisse Leveraged Loans</i>				1.9	4.4	5.6	5.4	4.4	5.8	4.6	Oct-05
<i>eV US Float-Rate Bank Loan Fixed Inc Gross Median</i>				1.9	4.0	5.3	5.3	4.4	6.4	5.1	Oct-05
<i>eV US Float-Rate Bank Loan Fixed Inc Gross Rank</i>				99	96	97	97	91	96	98	Oct-05
Lazard Emerging Market Debt Blend	28,036,505	2.9	46.0	-0.1	-6.6	-5.9	4.9	0.5	--	0.5	Aug-13
<i>50% JPM EMBI GD / 50% JPM GBI-EM</i>				0.2	-5.6	-4.6	5.7	1.9	5.2	1.8	Aug-13
<i>Emerging Markets Bond MStar MF Median</i>				1.3	-4.4	-3.3	5.6	3.7	6.7	3.6	Aug-13
<i>Emerging Markets Bond MStar MF Rank</i>				76	86	90	78	88	--	86	Aug-13
Mezzanine Debt	9,111,661	0.9	14.9	2.1	8.5	13.5	12.1	11.7	8.3	--	Oct-02
Northstar Mezzanine Partners VI	5,967,252	0.6	65.5								
Newstone Capital Partners II	1,124,574	0.1	12.3								
Northstar Mezzanine Partners V	1,674,334	0.2	18.4								
Northstar Mezzanine Partners IV	242,637	0.0	2.7								
Newstone Capital Partners	20,297	0.0	0.2								
Northstar Mezzanine Partners III	82,567	0.0	0.9								

## Retirement System Summary

As of September 30, 2018

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Real Estate</b>	<b>80,742,970</b>	<b>8.2</b>	<b>8.2</b>	<b>1.7</b>	<b>6.7</b>	<b>9.1</b>	<b>8.9</b>	<b>10.2</b>	<b>6.3</b>	<b>7.8</b>	<b>Oct-00</b>
<i>NCREIF ODCE</i>				2.1	6.5	8.7	8.8	10.7	5.6	8.1	Oct-00
<b>Open-End Real Estate</b>	<b>72,662,176</b>	<b>7.4</b>	<b>90.0</b>	<b>1.6</b>	<b>6.4</b>	<b>9.0</b>	<b>8.6</b>	<b>10.1</b>	<b>5.2</b>	<b>7.4</b>	<b>Jan-99</b>
PRIT Real Estate	72,662,176	7.4	100.0	1.6	6.4	9.0	8.8	10.3	--	11.5	Apr-10
<i>NCREIF ODCE</i>				2.1	6.5	8.7	8.8	10.7	5.6	12.5	Apr-10
<i>NCREIF ODCE Equal Weighted</i>				2.1	6.5	8.8	9.1	10.9	5.4	12.6	Apr-10
<i>Custom Benchmark</i>				1.7	5.2	7.8	8.8	10.2	6.3	12.1	Apr-10
<b>Non-Core Real Estate</b>	<b>8,080,794</b>	<b>0.8</b>	<b>10.0</b>	<b>2.9</b>	<b>8.9</b>	<b>9.3</b>	<b>12.4</b>	<b>13.8</b>	<b>9.9</b>	<b>12.3</b>	<b>Oct-05</b>
AEW Partners VII	6,027,405	0.6	74.6								
AEW Partners VI	2,053,389	0.2	25.4								

## Retirement System Summary

As of September 30, 2018

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Private Equity</b>	<b>59,829,501</b>	<b>6.1</b>	<b>6.1</b>	<b>3.9</b>	<b>8.8</b>	<b>16.2</b>	<b>9.3</b>	<b>9.1</b>	<b>6.6</b>	<b>9.4</b>	<b>Oct-00</b>
<i>Cambridge Associates Fund of Funds Composite 1-Quarter Lag</i>				<i>4.0</i>	<i>12.7</i>	<i>16.5</i>	<i>9.8</i>	<i>12.5</i>	<i>8.3</i>	<i>5.2</i>	<i>Oct-00</i>
<b>Buyouts</b>	<b>41,198,398</b>	<b>4.2</b>	<b>68.9</b>	<b>4.8</b>	<b>12.1</b>	<b>21.5</b>	<b>12.3</b>	<b>11.0</b>	<b>8.1</b>	<b>12.4</b>	<b>Oct-05</b>
American Securities Partners VI	3,644,548	0.4	8.8								
Riverside Capital Appreciation Fund VI	6,215,887	0.6	15.1								
Vitruvian Investment Partnership I	4,439,440	0.5	10.8								
Riverside Micro Cap Fund III	5,960,476	0.6	14.5								
Ridgemont II	7,180,165	0.7	17.4								
Capital International Private Equity Fund VI	5,966,766	0.6	14.5								
Harvest Partners V	1,370,646	0.1	3.3								
TA XII	4,404,290	0.4	10.7								
Riverside Capital Fund V	1,125,205	0.1	2.7								
Riverside Europe III	455,104	0.0	1.1								
Charlesbank Equity Fund VI	400,752	0.0	1.0								
2003 Riverside Capital Appreciation	24,717	0.0	0.1								
Charlesbank Equity Fund V	10,403	0.0	0.0								

## Retirement System Summary

As of September 30, 2018

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Fund of Funds</b>	<b>8,692,664</b>	<b>0.9</b>	<b>14.5</b>	<b>1.2</b>	<b>4.6</b>	<b>5.7</b>	<b>-13.7</b>	<b>-3.8</b>	<b>-4.8</b>	<b>6.7</b>	<b>Oct-05</b>
PRIT Vintage Year 2016	3,687,005	0.4	42.4								
PRIT Vintage Year 2017	3,594,942	0.4	41.4								
European Strategic Partners	81,326	0.0	0.9								
INVESCO Private Capital II	85,359	0.0	1.0								
PRIT Vintage Year 2018	1,244,033	0.1	14.3								
<b>Venture Capital Funds</b>	<b>9,938,439</b>	<b>1.0</b>	<b>16.6</b>	<b>2.2</b>	<b>-1.3</b>	<b>1.7</b>	<b>2.0</b>	<b>3.9</b>	<b>5.0</b>	<b>6.6</b>	<b>Oct-05</b>
Ascent Venture Partners V	4,438,280	0.5	44.7								
Asecent Venture Partners VI	3,948,040	0.4	39.7								
Boston Millennia Partners III	571,580	0.1	5.8								
Boston Millennia Partners II	499,805	0.1	5.0								
Ascent Venture Partners II	23,532	0.0	0.2								
Ascent Venture Partners IV	215,294	0.0	2.2								
Ascent Venture Partners III	241,907	0.0	2.4								
<b>PRIT General Allocation</b>	<b>251,804,210</b>	<b>25.6</b>	<b>25.6</b>	<b>2.7</b>	<b>4.2</b>	<b>8.2</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>11.2</b>	<b>Jun-16</b>
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>				2.2	1.4	5.3	8.8	5.5	6.3	8.6	Jun-16
PRIT General Allocation Fund (Net of Fees)	251,804,210	25.6	100.0	2.7	4.2	8.2	--	--	--	11.2	Jun-16
<i>60% MSCI ACWI / 40% Barclays Global Aggregate</i>				2.2	1.4	5.3	8.8	5.5	6.3	8.6	Jun-16

Worcester Retirement System  
Retirement System Summary

As of September 30, 2018

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Real Assets</b>	<b>65,998,010</b>	<b>6.7</b>	<b>6.7</b>	<b>4.1</b>	<b>7.9</b>	<b>10.6</b>	<b>11.0</b>	<b>5.6</b>	<b>3.9</b>	<b>4.0</b>	<b>Oct-06</b>
<i>CPI+3%</i>				1.2	3.9	5.3	5.0	4.5	4.4	4.8	Oct-06
<b>Natural Resources Assets</b>	<b>16,766,125</b>	<b>1.7</b>	<b>25.4</b>	<b>4.9</b>	<b>6.0</b>	<b>8.2</b>	<b>14.1</b>	<b>1.5</b>	<b>--</b>	<b>--</b>	
<i>S&amp;P Global Natural Resources Index TR USD</i>				1.3	5.1	14.1	19.7	4.1	3.2	--	
<b>Natural Resources (Public)</b>	<b>8,782,961</b>	<b>0.9</b>	<b>52.4</b>	<b>1.2</b>	<b>4.2</b>	<b>12.2</b>	<b>17.0</b>	<b>2.2</b>	<b>--</b>	<b>-1.8</b>	<b>May-11</b>
SSgA Global Natural Resources Stock Index	8,782,961	0.9	100.0	1.2	4.2	12.2	17.0	2.2	--	-1.8	May-11
<i>S&amp;P Global LargeMidCap Commodity and Resources     GR USD</i>				1.2	4.2	12.2	17.0	2.2	3.1	-1.6	May-11
<i>Natural Resources MStar MF Median</i>				-0.1	-0.5	8.4	10.6	1.4	1.2	-2.0	May-11
<i>Natural Resources MStar MF Rank</i>				25	4	8	1	36	--	46	May-11
<b>Natural Resources (Private)</b>	<b>7,983,164</b>	<b>0.8</b>	<b>47.6</b>	<b>9.3</b>	<b>8.5</b>	<b>5.5</b>	<b>9.8</b>	<b>-3.0</b>	<b>--</b>	<b>8.7</b>	<b>Jul-10</b>
White Deer Energy II	7,433,823	0.8	93.1								
White Deer Energy	549,341	0.1	6.9								
<b>Timber</b>	<b>11,739,902</b>	<b>1.2</b>	<b>17.8</b>	<b>-1.1</b>	<b>0.5</b>	<b>-1.6</b>	<b>-0.7</b>	<b>-0.3</b>	<b>0.0</b>	<b>1.5</b>	<b>Oct-05</b>
<i>NCREIF Timberland</i>				1.0	1.5	3.0	3.2	5.8	3.9	6.8	Oct-05
RMK Select Timberland Investment Fund I	5,221,497	0.5	44.5								
Hancock Timberland VII	2,371,489	0.2	20.2								
RMK Select Timberland Investment Fund II	2,950,565	0.3	25.1								
RMK Balanced Timberland B	1,196,351	0.1	10.2								



As of September 30, 2018

	Market Value (\$)	% of Portfolio	% of Sector	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Infrastructure</b>	<b>37,491,983</b>	<b>3.8</b>	<b>56.8</b>	<b>5.6</b>	<b>12.1</b>	<b>18.0</b>	<b>29.6</b>	<b>29.9</b>	<b>18.8</b>	<b>16.2</b>	<b>Jun-08</b>
<i>DJ Brookfield Global Infrastructure Net TR USD</i>				-0.8	-2.1	-1.6	7.4	6.1	9.1	6.5	Jun-08
IFM Global Infrastructure (Net of Fees)	22,136,683	2.3	59.0	6.2	14.6	19.4	--	--	--	19.4	Sep-17
Global Infrastructure Partners	4,287,410	0.4	11.4								
Global Infrastructure Partners III	11,067,890	1.1	29.5								
<b>Cash</b>	<b>1,141,316</b>	<b>0.1</b>	<b>0.1</b>								
State Street STIF - Cash	1,141,316	0.1	100.0								