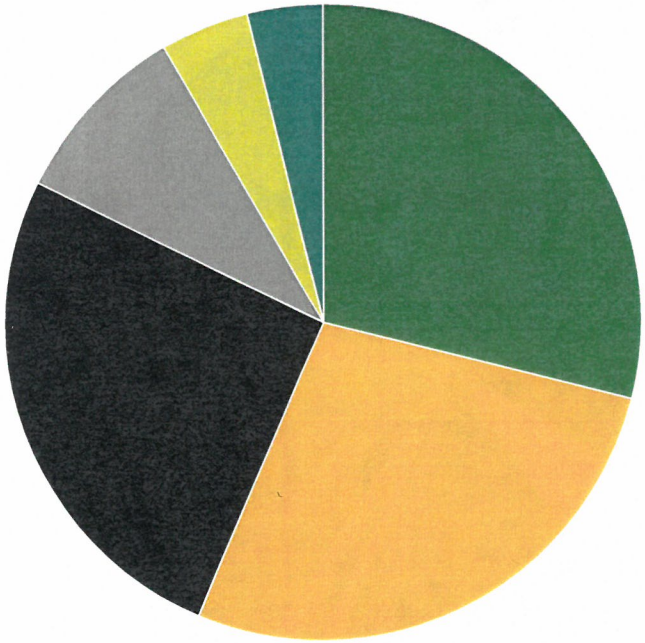
City of Memphis

Asset Allocation Chart

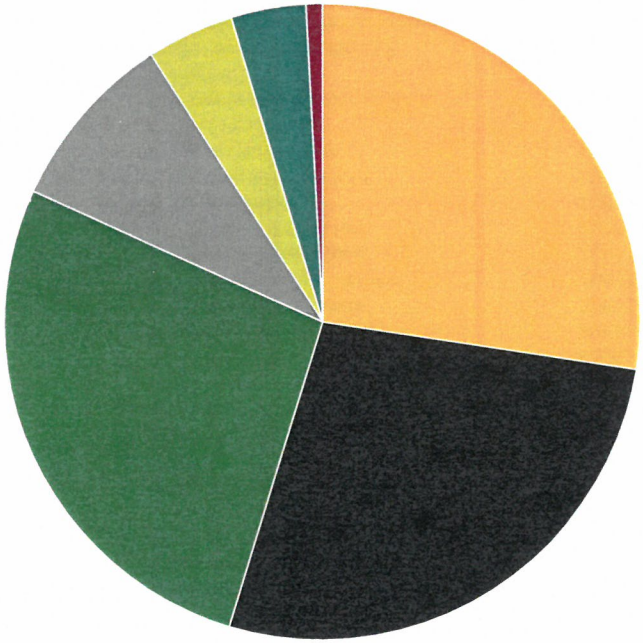
As of December 31, 2019

September 30, 2019 : $2,312,493,444



	Market Value ($)	Allocation (%)
Fixed Income Composite	670,301,394	28.99
Domestic Equity Composite	634,062,268	27.42
International Equity Composite	599,754,623	25.94
Total Real Estate Composite	217,458,354	9.40
Hedge Fund Composite	103,489,514	4.48
Private Equity Composite	87,327,813	3.78
In House Cash	99,478	0.00

December 31, 2019 : $2,417,237,713



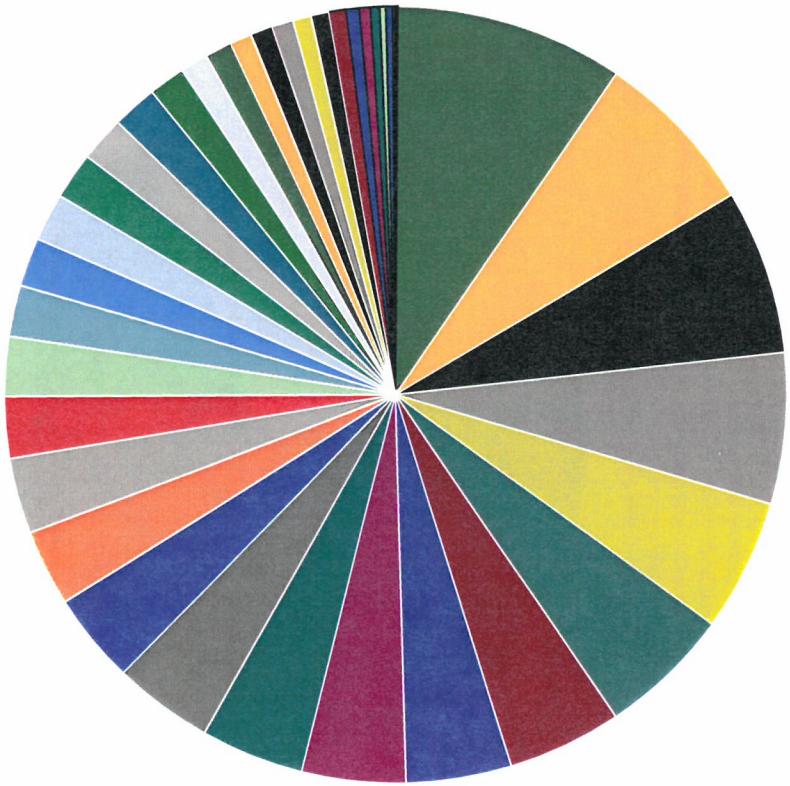
	Market Value ($)	Allocation (%)
Domestic Equity Composite	665,617,184	27.54
International Equity Composite	657,480,285	27.20
Fixed Income Composite	655,871,097	27.13
Total Real Estate Composite	220,962,444	9.14
Hedge Fund Composite	106,535,120	4.41
Private Equity Composite	90,705,224	3.75
In House Cash	20,066,359	0.83

City of Memphis

Asset Allocation Chart

As of December 31, 2019

September 30, 2019 : $2,312,493,444



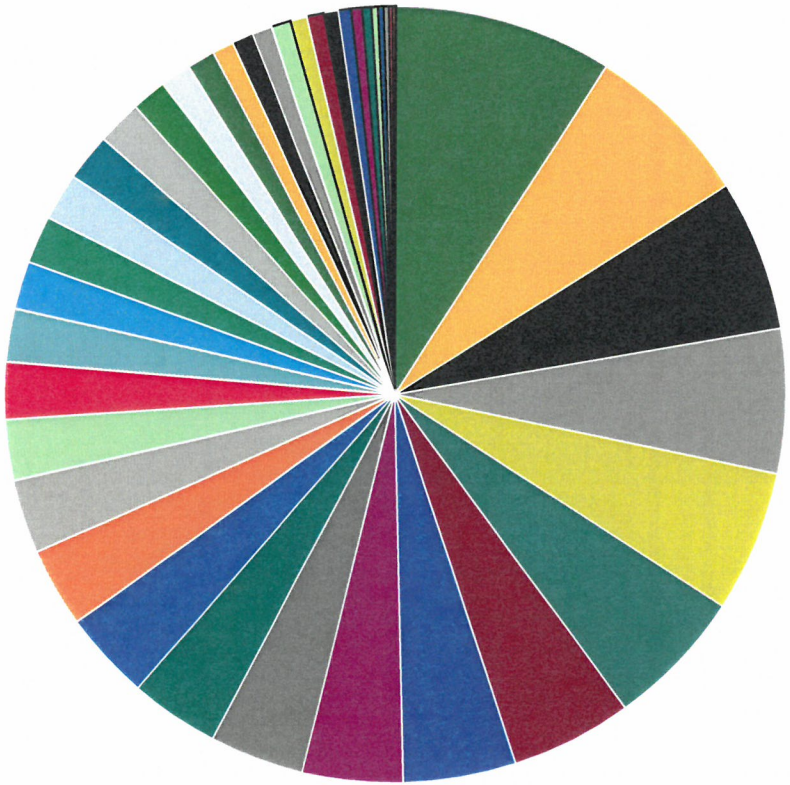
	Market Value ($)	Allocation (%)
Brandywine	217,179,945	9.39
Rhumbline S&P 500	159,762,620	6.91
Mackay Shields	158,724,807	6.86
Barrow, Hanley	144,854,278	6.26
1607 Capital Partners	127,655,369	5.52
Marathon Asset Mgmt	127,050,110	5.49
J.P. Morgan Global Emerging Markets Discovery Fund	108,600,850	4.70
Acadian EM Equity II	100,337,231	4.34
Prudential Core Conserv Bond	99,809,404	4.32
PIMCO	99,311,687	4.29
Smith Graham	95,275,551	4.12
Principal Global Investors	86,592,587	3.74
Winslow Capital Management	73,208,331	3.17
BlackRock US Core Property Fund	72,997,566	3.16
Rhumbline Russell 1000 Growth	58,721,403	2.54
NTGI S&P 400	57,163,938	2.47
Strategic Global Advisors	49,518,475	2.14
Aetos	46,842,986	2.03
Grosvenor Institutional Partners, L.P.	46,128,603	1.99
Conestoga Capital Advisors	45,161,509	1.95
NB Crossroads Fund XXI	43,515,543	1.88
Capital Prospects SMID	42,888,852	1.85
Pantheon Global Secondary Fund V	34,959,350	1.51
Nicholas Investment Partners	26,455,317	1.14
Capital Prospects Small Cap Value	25,846,020	1.12
Gerding Edlen Green Cities III, L.P.	21,310,882	0.92
TA Realty Core Property Fund	20,932,153	0.91
TA Realty Fund XI	20,916,784	0.90
Long Wharf RE Partners V, L.P.	17,626,573	0.76
Vanguard REIT Index Inv	17,236,156	0.75
RREEF REIT II	16,478,065	0.71
Mesirow Real Estate Value Fund III, L.P.	12,838,531	0.56
Preserver, L.P.	10,517,925	0.45
SSM Partners Growth Equity II L.P.	8,852,920	0.38
Cornerstone (Barings) Real Estate Advisers Fund X	6,026,477	0.26
Long Wharf Real Estate Partners IV, L.P.	6,023,528	0.26
Long Wharf RE Partners VI, L.P.	2,615,004	0.11
Dune Real Estate Fund IV	2,063,470	0.09
Gerding Edlen Green Cities IV, L.P.	389,716	0.02
In House Cash	99,478	0.00
Cornerstone (Barings) Real Estate Advisers VIII	3,450	0.00
SSM Partners Growth Equity III, LP	-	0.00

City of Memphis

Asset Allocation Chart

As of December 31, 2019

December 31, 2019 : $2,417,237,713



	Market Value ($)	Allocation (%)
Brandywine	217,551,403	9.00
Rhumbline S&P 500	169,023,528	6.99
Mackay Shields	153,069,316	6.33
Barrow, Hanley	144,939,480	6.00
1607 Capital Partners	142,409,110	5.89
Marathon Asset Mgmt	139,697,297	5.78
J.P. Morgan Global Emerging Markets Discovery Fund	120,381,820	4.98
Acadian EM Equity II	112,370,524	4.65
Prudential Core Conserv Bond	99,988,325	4.14
Smith Graham	95,598,667	3.95
PIMCO	89,663,385	3.71
Principal Global Investors	88,779,542	3.67
Winslow Capital Management	80,152,762	3.32
BlackRock US Core Property Fund	74,283,758	3.07
NTGI S&P 400	61,206,354	2.53
Rhumbline Russell 1000 Growth	56,964,407	2.36
Strategic Global Advisors	53,841,992	2.23
Aetos	48,285,698	2.00
Conestoga Capital Advisors	47,716,428	1.97
Grosvenor Institutional Partners, L.P.	47,509,564	1.97
Capital Prospects SMID	47,292,110	1.96
NB Crossroads Fund XXI	45,015,543	1.86
Pantheon Global Secondary Fund V	35,309,350	1.46
Nicholas Investment Partners	30,056,569	1.24
Capital Prospects Small Cap Value	28,265,546	1.17
Gerding Edlen Green Cities III, L.P.	21,360,278	0.88
TA Realty Core Property Fund	21,301,482	0.88
TA Realty Fund XI	20,118,160	0.83
In House Cash	20,066,359	0.83
Long Wharf RE Partners V, L.P.	16,824,125	0.70
RREEF REIT II	16,573,257	0.69
Vanguard REIT Index Inv	14,308,516	0.59
Mesirow Real Estate Value Fund III, L.P.	12,715,053	0.53
Preserver, L.P.	10,739,858	0.44
SSM Partners Growth Equity II L.P.	9,552,920	0.40
Cornerstone (Barings) Real Estate Advisers Fund X	6,421,293	0.27
Long Wharf Real Estate Partners IV, L.P.	5,619,353	0.23
Dune Real Estate Fund IV	5,187,736	0.21
Gerding Edlen Green Cities IV, L.P.	3,454,042	0.14
Long Wharf RE Partners VI, L.P.	2,795,392	0.12
SSM Partners Growth Equity III, LP	827,411	0.03
Cornerstone (Barings) Real Estate Advisers VIII	-	0.00

City of Memphis

Asset Allocation Comparison

Portfolio Value 12/31/19

$2,417,237,713

Target Allocations		(000)	Current Managers & Allocations		(000)	Difference	Range
Equity							
Large Cap Equity	17.00%	$410,930	Barrow, Hanley (large cap value)	6.00%	$144,939	1.66%	13%-21%
			Rhumbline Russell 1000 Growth (large cap growth)	2.36%	$56,964		
			Winslow (large cap growth)	3.32%	$80,153		
			Rhumbline S&P 500 (large cap core)	6.99%	$169,024		
Mid/SMID Cap Equity	5.00%	$120,862	Northern Trust (mid cap core)	2.53%	$61,206	-0.51%	0%-7%
			Capital Prospects SMID Cap*	1.96%	$47,292		
Small Cap Equity	5.00%	$120,862	Capital Prospects Small Cap Value*	1.17%	$28,266	-0.61%	0%-7%
			Conestoga (small cap growth)	1.97%	$47,716		
			Nicholas (small cap growth)	1.24%	$30,057		
Domestic Equity	**27.00%**	**$652,654**	**Domestic Equity**	**27.54%**	**$665,617**	0.54%	17%37%
Developed International	18.50%	$447,189	1607 Capital Partners	5.89%	$142,409	-0.93%	14%-23%
			Principal Global Investors	3.67%	$88,780		
			Marathon Asset Mgmt	5.78%	$139,697		
			Strategic Global Advisors	2.23%	$53,842		
Emerging Markets	8.50%	$205,465	Acadian	4.65%	$112,371	1.13%	5%-12%
			JPMorgan	4.98%	$120,382		
International	**27.00%**	**$652,654**	**International**	**27.20%**	**$657,480**	0.20%	17%-37%
Equity Total	54.00%	$1,305,308	***Equity Total***	54.74%	$1,323,097	0.74%	
Fixed Income							
Core Fixed Income	12.00%	$290,069	PIMCO	3.71%	$89,663	-0.20%	7%-17%
			Prudential Core Conserv Bond	4.14%	$99,988		
			Smith Graham	3.95%	$95,599		
Global Fixed Income	10.00%	$241,724	Brandywine	9.00%	$217,551	-1.00%	3%-13%
Global High Yield	6.00%	$145,034	Mackay Shields	6.33%	$153,069	0.33%	3%-13%
Fixed Income Total	28.00%	$676,827	***Fixed Income Total***	27.13%	$655,871	-0.87%	20%-36%

Segal Marco Advisors

*** Emerging Managers**

Real Estate								
Core/Value Add/REITs	10.00%	$241,724	BlackRock US Core Property Fund	3.07%	$74,284			
			RREEF REIT II	0.69%	$16,573			
			Vanguard REIT Index	0.59%	$14,309			
			TA Realty Core Property Fund	0.88%	$21,301			
			Long Wharf Real Estate Partners IV	0.23%	$5,619	(Total Commitment $20M, Total Drawn $21.5M, Total Distributed $26.1M)		
			Long Wharf Real Estate Partners Fund V	0.70%	$16,824	(Total Commitment $20M, Total Drawn $20.0M, Total Distributed $7.9M)		
			Long Wharf Real Estate Partners Fund VI	0.12%	$2,795	(Total Commitment $20M, Total Drawn $3.1M, Total Distributed $0.1M)		
			Cornerstone (Barings) Real Estate Fund X[1]	0.27%	$6,421	(Total Commitment $10M, Total Drawn $7.9M, Total Distributed $3.8M)		
			Gerding Edlen Green Cities III	0.88%	$21,360	(Total Commitment $20M, Total Drawn $23.5M, Total Distributed $6.6M)		
			Gerding Edlen Green Cities IV	0.14%	$3,454	(Total Commitment $20M, Total Drawn $3.9M, Total Distributed $0.1M)		
			TA Realty Fund XI	0.83%	$20,118	(Total Commitment $20M, Total Drawn $20.0M, Total Distributed $4.5M)		
			Mesirow Financial Real Estate Value Fund III	0.53%	$12,715	(Total Commitment $20M, Total Drawn $13.9M, Total Distributed $1.4M)		
			Dune Real Estate Partners Fund IV	0.21%	$5,188	(Total Commitment $30M, Total Drawn $5.8M, Total Distributed $0.0M)		
Real Estate Total	10.00%	$241,724	*Real Estate Total*	9.14%	$220,962		-0.86%	5%-10%
Private Equity								
Secondary	2.00%		Pantheon Global Secondary Fund V	1.46%	$35,309	(Total Commitment $50M, Total Drawn $35.2M, Total Distributed $11.6M)		
Direct Private Equity			SSM Growth Equity Fund II*	0.40%	$9,553	(Total Commitment $10M, Total Drawn $8.1, Total Distributed $0.0M)		
			SSM Growth Equity Fund III*	0.03%	$827	(Total Commitment $10M, Total Drawn $1.0, Total Distributed $0.0M)		
Diversified FoF	2.00%		Neuberger Berman Crossroads XXI	1.86%	$45,016	(Total Commitment $50M, Total Drawn $35.0M, Total Distributed $0.0M)		
Private Equity Total	4.00%	$96,690		3.75%	$90,705		-0.25%	2%-6%
Hedge Fund of Funds								
	4.00%		Aetos	2.00%	$48,286			
			Grosvenor	1.97%	$47,510			
			Preserver, LP*	0.44%	$10,740			
Hedge Fund of Funds Total	4.00%	$96,690		4.41%	$106,535		0.41%	2%-6%
Internal Account	0.00%	$0	Internal Account	0.83%	$20,066			
Cash	0.00%	$0	*Cash*	0.83%	$20,066		0.83%	0%-5%
Total	100%	$2,417,238	**Total**	100%	$2,417,238			

[1] Cornerstone Real Estate Advisers now operates under the investment adviser name "Barings Real Estate Advisers," however; all predecessor funds retain the name Cornerstone. All new products open to new investors will operate under the name "Barings Real Estate Advisers" moving forward.

*** Emerging Managers**

City of Memphis

Comparative Performance

As of December 31, 2019

	Performance (%)								
	1 Quarter	Year To Date	1 Year	3 Years	5 Years	7 Years	10 Years	Since Inception	Inception Date
Total Fund Composite	5.93	18.57	18.57	9.91	7.28	8.45	8.71	9.52	10/01/1982
Policy Index	*5.82*	*18.76*	*18.76*	*9.82*	*7.38*	*8.24*	*8.29*	*9.96*	
In House Cash	0.39	2.12	2.12	1.57	1.05	0.78	0.66	4.11	10/01/1982
90 Day U.S. Treasury Bill	*0.46*	*2.28*	*2.28*	*1.67*	*1.05*	*0.77*	*0.56*	*3.86*	
Domestic Equity Composite	8.64	30.07	30.07	14.50	10.28	13.36	12.78	11.97	10/01/1982
Russell 3000 Index	*9.10*	*31.02*	*31.02*	*14.57*	*11.24*	*14.38*	*13.42*	*11.80*	
Fixed Income Composite	1.91	9.88	9.88	5.18	4.07	3.58	4.85	7.48	10/01/1982
Fixed Income Index	*0.81*	*9.16*	*9.16*	*4.56*	*3.50*	*3.25*	*4.24*	*7.39*	
International Equity Composite	10.57	24.67	24.67	11.97	7.61	8.09	7.50	5.46	01/01/1990
International Equity Index	*9.31*	*20.95*	*20.95*	*10.24*	*5.80*	*5.78*	*5.39*	*5.26*	
Hedge Fund Composite	2.94	7.94	7.94	4.28	N/A	N/A	N/A	5.10	04/01/2016
90-Day T-Bill+ 5%	*1.69*	*7.39*	*7.39*	*6.75*	*6.11*	*5.80*	*5.59*	*6.45*	
HFRI FOF: Conservative Index	*1.67*	*6.34*	*6.34*	*3.19*	*2.36*	*3.22*	*2.80*	*3.63*	
Core Private Real Estate Composite	1.67	10.10	10.10	7.56	8.61	9.96	11.95	8.37	09/01/1999
NCREIF Property Index	*1.55*	*6.42*	*6.42*	*6.70*	*8.25*	*9.14*	*10.18*	*8.81*	

Gross of Fees.

City of Memphis

Comparative Performance

As of December 31, 2019

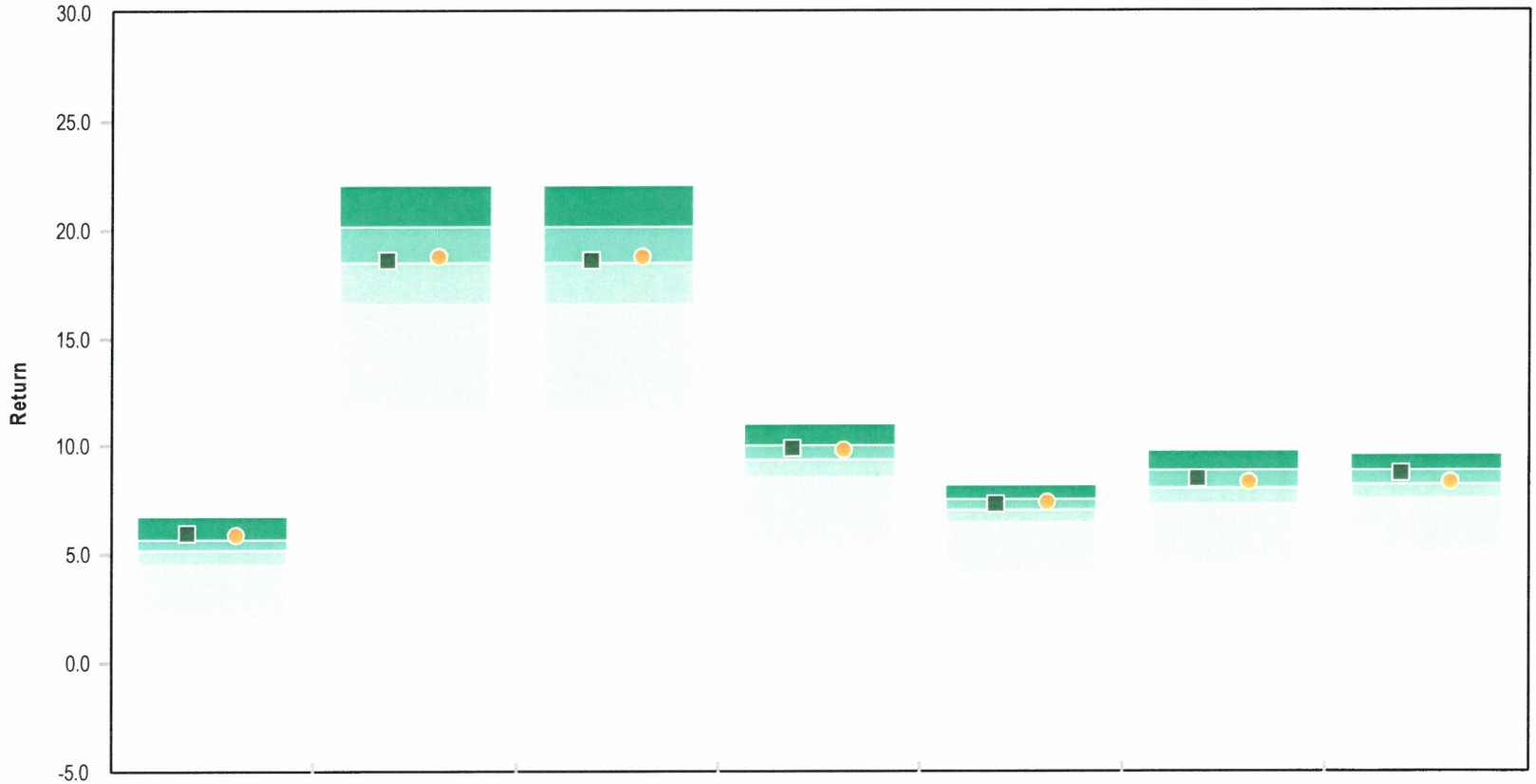
	Performance (%)									
	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Total Fund Composite	-5.39	18.36	6.76	0.24	5.49	17.71	13.75	0.72	14.05	22.23
Policy Index	*-4.45*	*16.72*	*8.00*	*-0.19*	*5.86*	*15.19*	*12.79*	*0.77*	*12.11*	*19.76*
In House Cash	1.93	0.67	0.35	0.18	0.11	0.11	0.20	0.54	0.36	0.34
90 Day U.S. Treasury Bill	*1.87*	*0.86*	*0.25*	*0.03*	*0.04*	*0.05*	*0.08*	*0.08*	*0.13*	*0.17*
Domestic Equity Composite	-5.88	22.62	10.04	-1.26	8.80	35.55	16.30	0.65	18.23	28.67
Russell 3000 Index	*-5.24*	*21.13*	*12.74*	*0.48*	*12.56*	*33.55*	*16.42*	*1.03*	*16.93*	*28.34*
Fixed Income Composite	-0.98	6.94	5.14	-0.23	4.70	0.13	8.15	6.69	8.81	18.96
Fixed Income Index	*-0.89*	*5.65*	*4.83*	*-0.86*	*4.89*	*0.39*	*6.87*	*6.39*	*6.54*	*5.93*
International Equity Composite	-15.52	33.29	3.30	-0.50	-1.08	20.79	20.28	-12.77	13.91	36.19
International Equity Index	*-13.99*	*28.77*	*3.16*	*-4.06*	*-4.13*	*16.58*	*17.70*	*-13.18*	*11.60*	*42.14*
Hedge Fund Composite	-1.55	6.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
90-Day T-Bill+ 5%	*6.97*	*5.90*	*5.27*	*5.03*	*5.04*	*5.05*	*5.08*	*5.09*	*5.14*	*5.17*
HFRI FOF: Conservative Index	*-0.77*	*4.12*	*1.89*	*0.37*	*3.14*	*7.70*	*4.22*	*-3.55*	*5.07*	*9.65*
Core Private Real Estate Composite	4.91	7.75	8.50	11.92	20.06	7.12	14.60	13.01	22.87	-27.15
NCREIF Property Index	*6.72*	*6.96*	*7.97*	*13.33*	*11.82*	*10.98*	*10.54*	*14.26*	*13.11*	*-16.85*

Gross of Fees.

City of Memphis

All Public Plans-Total Fund

As of December 31, 2019



	1 Qtr	YTD	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs
Total Fund Composite	5.93 (18)	18.57 (48)	18.57 (48)	9.91 (31)	7.28 (40)	8.45 (40)	8.71 (32)
Policy Index	5.82 (22)	18.76 (46)	18.76 (46)	9.82 (35)	7.38 (35)	8.24 (46)	8.29 (48)
5th Percentile	6.81	22.04	22.04	11.02	8.21	9.75	9.59
1st Quartile	5.73	20.14	20.14	10.08	7.56	8.83	8.85
Median	5.19	18.45	18.45	9.37	7.04	8.02	8.23
3rd Quartile	4.52	16.53	16.53	8.52	6.42	7.24	7.54
95th Percentile	2.11	11.66	11.66	5.40	4.08	4.58	5.03

Parentheses contain percentile rankings.
Calculation based on quarterly periodicity.

Segal Marco Advisors