



Quarterly Investment Performance Analysis

Montana Board of Investments

Period Ended: September 30, 2019



Montana Board of Investments
Comparative Performance
Retirement Plans

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	20 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Public Employees' Retirement - Net	0.93	11.44	3.79	7.98	6.82	8.42	8.85	5.98	-2.63	14.80	7.32	1.86	8.07	7.62	07/01/1994
Public Employees' Benchmark	0.64	14.02	2.99	7.96	7.02	8.84	N/A	N/A	-5.57	15.35	9.12	1.40	9.13	N/A	
Difference	0.29	-2.58	0.80	0.02	-0.20	-0.42	N/A	N/A	2.94	-0.55	-1.80	0.46	-1.06	N/A	
Public Employees' Retirement - Gross	1.04	11.94	4.43	8.58	7.36	8.96	9.42	6.36	-2.03	15.34	7.78	2.31	8.61	7.93	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	35	42	58	30	13	5	3	55	45	63	56	7	5	49	
Teachers' Retirement - Net	0.93	11.43	3.79	7.96	6.82	8.42	8.85	5.98	-2.64	14.76	7.33	1.86	8.09	7.63	07/01/1994
Teachers' Benchmark	0.64	14.00	2.98	7.95	7.01	8.84	N/A	N/A	-5.57	15.32	9.11	1.40	9.16	N/A	
Difference	0.29	-2.57	0.81	0.01	-0.19	-0.42	N/A	N/A	2.93	-0.56	-1.78	0.46	-1.07	N/A	
Teachers' Retirement - Gross	1.05	11.94	4.43	8.56	7.36	8.97	9.42	6.36	-2.03	15.31	7.80	2.32	8.63	7.94	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	35	42	58	31	13	5	3	55	46	64	56	7	5	48	
Police Retirement - Net	0.94	11.46	3.81	7.98	6.83	8.42	8.83	5.92	-2.63	14.79	7.32	1.86	8.07	7.49	07/01/1994
Police Benchmark	0.63	14.01	2.98	7.95	7.01	8.80	N/A	N/A	-5.57	15.33	9.08	1.41	9.10	N/A	
Difference	0.31	-2.55	0.83	0.03	-0.18	-0.38	N/A	N/A	2.94	-0.54	-1.76	0.45	-1.03	N/A	
Police Retirement - Gross	1.06	11.96	4.45	8.58	7.37	8.97	9.40	6.30	-2.02	15.33	7.78	2.31	8.61	7.79	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	34	42	54	30	12	4	3	57	45	63	56	7	5	66	

Net performance shown is net of all manager fees and expenses (Net-All). All Public Plans > \$3B Total Fund Median is reported gross of fees. Benchmark returns reflect unmanaged indices which are not impacted by management fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. Retirement plan benchmarks' inception dates were updated to 1/1/2011.



Montana Board of Investments
Comparative Performance
Retirement Plans

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	20 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Firefighters' Retirement - Net	0.94	11.45	3.81	7.99	6.83	8.42	8.83	5.93	-2.62	14.79	7.32	1.87	8.07	7.48	07/01/1994
Firefighters' Benchmark	0.63	14.01	2.98	7.96	7.01	8.80	N/A	N/A	-5.57	15.33	9.09	1.41	9.10	N/A	
Difference	0.31	-2.56	0.83	0.03	-0.18	-0.38	N/A	N/A	2.95	-0.54	-1.77	0.46	-1.03	N/A	
Firefighters' Retirement - Gross	1.06	11.96	4.45	8.59	7.37	8.97	9.40	6.31	-2.01	15.34	7.78	2.32	8.61	7.78	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	35	42	54	30	12	4	3	56	45	63	56	7	5	66	
Sheriffs' Retirement - Net	0.92	11.43	3.79	7.98	6.82	8.41	8.83	5.94	-2.62	14.80	7.33	1.86	8.05	7.51	07/01/1994
Sheriffs' Benchmark	0.64	14.01	2.99	7.96	7.02	8.83	N/A	N/A	-5.56	15.35	9.13	1.40	9.12	N/A	
Difference	0.28	-2.58	0.80	0.02	-0.20	-0.42	N/A	N/A	2.94	-0.55	-1.80	0.46	-1.07	N/A	
Sheriffs' Retirement - Gross	1.04	11.93	4.43	8.58	7.36	8.96	9.39	6.32	-2.02	15.34	7.79	2.32	8.59	7.82	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	36	42	58	30	13	5	3	56	45	63	56	7	5	58	
Highway Patrol Retirement - Net	0.93	11.45	3.81	7.98	6.83	8.42	8.85	5.94	-2.62	14.79	7.30	1.87	8.08	7.51	07/01/1994
Highway Patrol Benchmark	0.64	14.03	3.00	7.96	7.02	8.81	N/A	N/A	-5.56	15.34	9.09	1.41	9.10	N/A	
Difference	0.29	-2.58	0.81	0.02	-0.19	-0.39	N/A	N/A	2.94	-0.55	-1.79	0.46	-1.02	N/A	
Highway Patrol Retirement - Gross	1.04	11.95	4.45	8.58	7.37	8.97	9.42	6.32	-2.01	15.33	7.77	2.32	8.62	7.82	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	35	42	54	30	12	5	3	56	45	63	57	7	5	59	

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Montana Board of Investments
Comparative Performance
Retirement Plans

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	20 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Game Wardens' Retirement - Net	0.92	11.43	3.80	7.99	6.83	8.41	8.83	5.92	-2.62	14.81	7.31	1.88	8.03	7.53	07/01/1994
Game Wardens' Benchmark	0.64	14.02	2.99	7.97	7.02	8.80	N/A	N/A	-5.56	15.36	9.11	1.41	9.06	N/A	
Difference	0.28	-2.59	0.81	0.02	-0.19	-0.39	N/A	N/A	2.94	-0.55	-1.80	0.47	-1.03	N/A	
Game Wardens' Retirement - Gross	1.04	11.94	4.44	8.58	7.37	8.96	9.39	6.30	-2.01	15.35	7.78	2.33	8.57	7.83	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	36	42	56	30	12	5	3	57	45	62	56	7	5	55	
Judges' Retirement - Net	0.92	11.44	3.79	7.98	6.83	8.41	8.84	5.94	-2.64	14.82	7.32	1.86	8.06	7.52	07/01/1994
Judges' Benchmark	0.64	14.04	2.99	7.97	7.02	8.80	N/A	N/A	-5.58	15.37	9.10	1.40	9.08	N/A	
Difference	0.28	-2.60	0.80	0.01	-0.19	-0.39	N/A	N/A	2.94	-0.55	-1.78	0.46	-1.02	N/A	
Judges' Retirement - Gross	1.04	11.95	4.43	8.58	7.37	8.96	9.41	6.32	-2.03	15.36	7.79	2.32	8.60	7.83	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	36	42	58	30	12	5	3	56	46	62	56	7	5	57	
Volunteer Firefighters' Retirement - Net	0.93	11.45	3.78	7.98	6.80	8.41	8.86	6.30	-2.64	14.79	7.16	1.91	8.09	7.32	07/01/1994
Volunteer Firefighters' Benchmark	0.64	14.03	2.98	7.95	7.01	8.81	N/A	N/A	-5.59	15.33	9.08	1.42	9.11	N/A	
Difference	0.29	-2.58	0.80	0.03	-0.21	-0.40	N/A	N/A	2.95	-0.54	-1.92	0.49	-1.02	N/A	
Volunteer Firefighters' Retirement - Gross	1.05	11.95	4.42	8.57	7.34	8.96	9.42	6.68	-2.04	15.34	7.63	2.36	8.63	7.62	07/01/1994
All Public Plans > \$3B Total Fund Median	0.91	11.73	4.51	8.27	6.67	7.90	8.30	6.41	-2.49	16.05	7.95	0.58	6.81	7.91	
Rank	35	42	58	30	13	5	3	26	46	63	64	7	5	76	

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Montana Board of Investments
 Asset Allocation by Segment
 Retirement Plans

As of September 30, 2019

	Consolidated Asset Pension Pool (CAPP)		Short Term Investment Pool (STIP)		Total Fund	
	(\$)	%	(\$)	%	(\$)	%
Public Employees' Retirement	5,783,110,208	49.67	112,938,270	42.81	5,896,048,478	49.51
Teachers' Retirement	4,113,100,783	35.32	116,257,355	44.07	4,229,358,138	35.52
Police Retirement	429,839,227	3.69	8,569,779	3.25	438,409,006	3.68
Firefighters' Retirement	452,185,182	3.88	9,038,015	3.43	461,223,197	3.87
Sheriffs' Retirement	371,176,337	3.19	7,735,098	2.93	378,911,435	3.18
Highway Patrol Retirement	149,039,227	1.28	2,701,615	1.02	151,740,841	1.27
Game Wardens' Retirement	204,117,199	1.75	3,757,128	1.42	207,874,327	1.75
Judges' Retirement	102,914,905	0.88	2,048,847	0.78	104,963,752	0.88
Volunteer Firefighters' Retirement	38,334,938	0.33	781,970	0.30	39,116,908	0.33
Retirement Plans Total Fund Composite	11,643,818,006	97.78	263,828,076	2.22	11,907,646,082	100.00

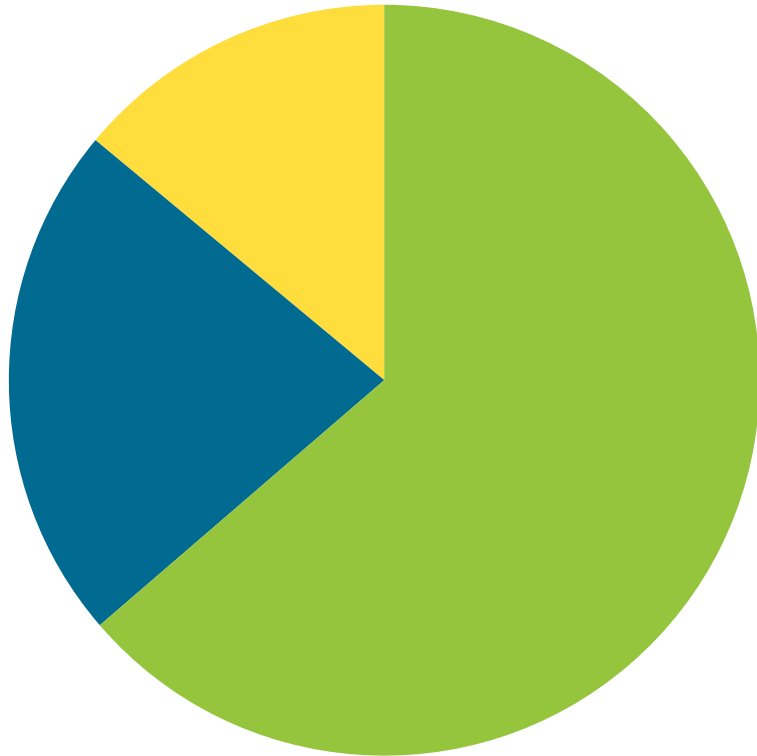
September 30, 2019 : \$11,907,646,082



Allocations shown may not sum up to 100% exactly due to rounding. Retirement Plan market values may differ from State Street due to uninvested amounts not included in segment totals.



September 30, 2019 : \$18,284,758,238



	Market Value (\$)	Allocation (%)
Consolidated Asset Pension Pool (CAPP)	11,643,817,964	63.68
Short Term Investment Pool	4,087,670,436	22.36
Trust Funds Investment Pool	2,553,269,838	13.96

Allocations shown may not sum up to 100% exactly due to rounding. Market values do not include pending transactions.

Montana Board of Investments
Comparative Performance
Investment Pools

As of September 30, 2019

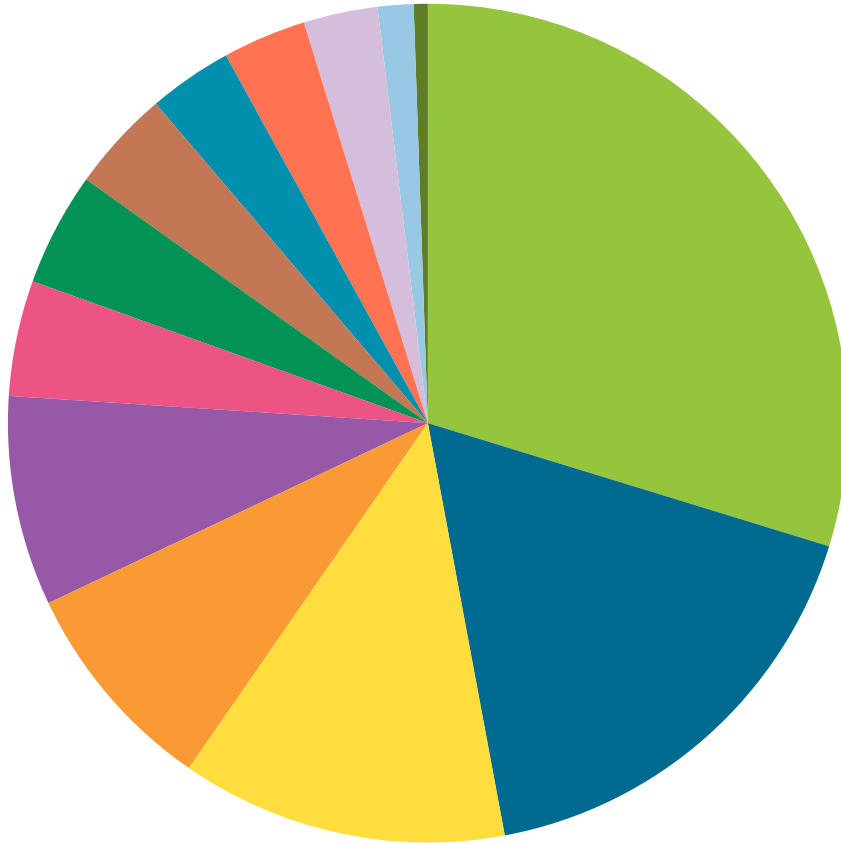
	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Consolidated Asset Pension Pool (CAPP)	0.94	11.70	3.86	N/A	N/A	N/A	N/A	-2.74	N/A	N/A	N/A	N/A	7.59	04/01/2017
CAPP Custom Benchmark	0.63	14.34	3.02	N/A	N/A	N/A	N/A	-5.74	N/A	N/A	N/A	N/A	7.35	
Difference	0.31	-2.64	0.84	N/A	N/A	N/A	N/A	3.00	N/A	N/A	N/A	N/A	0.24	
Trust Funds Investment Pool	2.00	8.49	9.91	3.45	4.12	3.73	5.00	0.45	4.01	4.02	1.83	6.96	6.15	10/01/1995
Bloomberg US Agg Bond Index	2.27	8.52	10.30	2.92	3.38	2.72	3.75	0.01	3.54	2.65	0.55	5.97	5.23	
Difference	-0.27	-0.03	-0.39	0.53	0.74	1.01	1.25	0.44	0.47	1.37	1.28	0.99	0.92	
Short Term Investment Pool	0.56	1.81	2.40	1.69	1.15	0.87	0.70	1.98	1.11	0.61	0.22	0.10	2.46	04/01/1997
Short Term Custom Index	0.52	1.72	2.30	1.66	1.12	0.85	0.67	1.95	1.15	0.52	0.21	0.16	2.39	
Difference	0.04	0.09	0.10	0.03	0.03	0.02	0.03	0.03	-0.04	0.09	0.01	-0.06	0.07	
iMoney.net Money Fund (Gross) Median	0.59	1.94	2.57	1.83	1.24	0.94	0.75	2.15	1.21	0.61	0.25	0.17	2.45	
Difference	-0.03	-0.13	-0.17	-0.14	-0.09	-0.07	-0.05	-0.17	-0.10	0.00	-0.03	-0.07	0.01	

Performance shown is net of all manager fees and expenses (Net-All). Benchmark returns reflect unmanaged indices which are not impacted by management fees. Fiscal year ends on 06/30. See the Addendum for custom index specification. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
 Asset Allocation
 Consolidated Asset Pension Pool (CAPP)

As of September 30, 2019

September 30, 2019 : \$11,643,817,988



	Market Value (\$)	Allocation (%)
Domestic Equity	3,463,442,334	29.74
International Equity	2,016,816,450	17.32
Private Equity	1,463,425,755	12.57
US Treasury & Agency	967,302,430	8.31
Real Estate	942,605,354	8.10
Mortgage - Backed	518,060,040	4.45
TIPS	510,802,518	4.39
Investment Grade Credit	455,278,527	3.91
Cash Pension	376,647,114	3.23
High Yield	374,319,778	3.21
Natural Resources	332,564,625	2.86
Broad Fixed Income	159,843,326	1.37
Diversifying Strategies	62,709,737	0.54

Allocations shown may not sum up to 100% exactly due to rounding.



Montana Board of Investments
Comparative Performance
Consolidated Asset Pension Pool (CAPP)

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Domestic Equity	1.05	20.24	1.54	11.98	9.77	12.58	12.70	-7.09	20.80	11.46	0.86	12.28	9.05	05/01/2003
Domestic Equity Custom Index	1.23	20.23	3.01	12.90	10.63	13.09	13.18	-5.20	21.05	13.03	1.01	13.08	9.84	
Difference	-0.18	0.01	-1.47	-0.92	-0.86	-0.51	-0.48	-1.89	-0.25	-1.57	-0.15	-0.80	-0.79	
International Equity	-1.60	12.81	-1.00	6.54	3.60	5.57	4.76	-14.99	28.67	3.87	-3.57	-4.00	4.58	04/01/1997
International Equity Custom Index	-1.72	11.39	-1.84	6.10	3.05	5.12	4.60	-14.76	27.81	4.41	-4.60	-4.03	4.86	
Difference	0.12	1.42	0.84	0.44	0.55	0.45	0.16	-0.23	0.86	-0.54	1.03	0.03	-0.28	
Broad Fixed Income	2.25	8.08	10.68	3.02	3.60	3.17	4.77	1.44	2.41	3.98	0.48	6.19	5.95	04/01/1997
Bloomberg US Agg Bond Index	2.27	8.52	10.30	2.92	3.38	2.72	3.75	0.01	3.54	2.65	0.55	5.97	5.26	
Difference	-0.02	-0.44	0.38	0.10	0.22	0.45	1.02	1.43	-1.13	1.33	-0.07	0.22	0.69	
Investment Grade Credit	1.59	8.68	9.49	N/A	N/A	N/A	N/A	-0.06	N/A	N/A	N/A	N/A	4.54	04/01/2017
Bloomberg US Corp Int Bond Index	1.74	8.94	9.57	3.50	3.68	3.28	4.63	-0.23	3.92	4.04	1.08	4.35	4.51	
Difference	-0.15	-0.26	-0.08	N/A	N/A	N/A	N/A	0.17	N/A	N/A	N/A	N/A	0.03	
US Treasury & Agency	1.26	5.42	7.68	N/A	N/A	N/A	N/A	1.41	N/A	N/A	N/A	N/A	3.03	04/01/2017
Bloomberg US Trsy Int Trm Index	1.18	5.22	7.58	1.80	2.19	1.59	2.39	1.41	1.14	1.06	1.18	2.57	2.87	
Difference	0.08	0.20	0.10	N/A	N/A	N/A	N/A	0.00	N/A	N/A	N/A	N/A	0.16	
High Yield	1.85	11.38	6.80	N/A	N/A	N/A	N/A	-2.27	N/A	N/A	N/A	N/A	4.95	04/01/2017
Bloomberg US HY 2% Issuer Cap Index	1.33	11.41	6.35	6.07	5.38	5.89	7.92	-2.08	7.50	17.13	-4.43	2.46	5.45	
Difference	0.52	-0.03	0.45	N/A	N/A	N/A	N/A	-0.19	N/A	N/A	N/A	N/A	-0.50	
Mortgage - Backed	1.32	5.87	8.18	N/A	N/A	N/A	N/A	1.45	N/A	N/A	N/A	N/A	3.78	04/01/2017
Bloomberg US MBS Index	1.37	5.60	7.80	2.32	2.80	2.36	3.14	0.99	2.47	1.67	1.51	6.08	3.42	
Difference	-0.05	0.27	0.38	N/A	N/A	N/A	N/A	0.46	N/A	N/A	N/A	N/A	0.36	
TIPS	0.66	5.90	5.85	N/A	N/A	N/A	N/A	-0.15	N/A	N/A	N/A	N/A	2.60	04/01/2017
Bloomberg US Trsy Infl Notes 1-10 Yr Index	0.60	5.80	5.75	1.94	1.95	0.90	2.69	-0.25	1.90	4.01	-0.52	0.91	2.52	
Difference	0.06	0.10	0.10	N/A	N/A	N/A	N/A	0.10	N/A	N/A	N/A	N/A	0.08	
Natural Resources	-2.33	-1.99	-2.40	N/A	N/A	N/A	N/A	5.55	N/A	N/A	N/A	N/A	3.79	04/01/2017
MSCI ACW Cmtty Producers Index (USD) (Net)	-7.40	5.08	-12.96	4.10	-2.30	-1.31	0.19	-11.75	13.70	32.44	-25.83	-14.69	2.78	
Difference	5.07	-7.07	10.56	N/A	N/A	N/A	N/A	17.30	N/A	N/A	N/A	N/A	1.01	

Performance shown is net of all manager fees and expenses (Net-All). Benchmark returns reflect unmanaged indices which are not impacted by management fees. Fiscal year ends on 06/30. Please see Addendum for custom index specification. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
 Comparative Performance
 Consolidated Asset Pension Pool (CAPP)

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Real Estate	2.06	5.80	7.81	8.64	10.01	10.13	8.57	9.19	9.17	8.82	14.27	12.13	4.13	06/01/2006
Real Estate Custom Index	7.69	26.82	18.31	9.32	10.42	10.70	9.69	-4.57	5.99	9.08	13.86	11.36	6.55	
Difference	-5.63	-21.02	-10.50	-0.68	-0.41	-0.57	-1.12	13.76	3.18	-0.26	0.41	0.77	-2.42	
Diversifying Strategies	0.60	9.34	8.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.15	03/01/2018
Bloomberg US Trsy Int Trm Index	1.18	5.22	7.58	1.80	2.19	1.59	2.39	1.41	1.14	1.06	1.18	2.57	5.03	
Difference	-0.58	4.12	0.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.12	
Cash Pension	0.43	1.79	2.36	N/A	N/A	N/A	N/A	2.00	N/A	N/A	N/A	N/A	1.85	05/01/2017
Short Term Custom Index	0.52	1.72	2.30	1.66	1.12	0.85	0.67	1.95	1.15	0.52	0.21	0.16	1.87	
Difference	-0.09	0.07	0.06	N/A	N/A	N/A	N/A	0.05	N/A	N/A	N/A	N/A	-0.02	
Private Equity Pool*	3.68	8.85	11.22	13.08	10.27	12.07	13.10	11.55	15.20	7.37	7.20	15.47	12.21	05/01/2002
Private Equity Custom Index	-1.17	17.22	-4.79	10.14	9.96	14.79	16.74	-9.99	20.59	20.11	3.68	23.31	10.95	
Difference	4.85	-8.37	16.01	2.94	0.31	-2.72	-3.64	21.54	-5.39	-12.74	3.52	-7.84	1.26	

For additional information on the Private Equity Custom Index, please see the Addendum. *Performance is based on the prior quarter's fair market value adjusted for cash flows during the most recent quarterly period.

Performance shown is net of all manager fees and expenses (Net-All). Benchmark returns reflect unmanaged indices which are not impacted by management fees. Fiscal year ends on 06/30. Please see Addendum for custom index specification. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Investment Pools

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Domestic Equity	1.11	20.50	1.86	12.32	10.09	12.91	13.07	-6.78	21.16	11.76	1.14	12.59	9.33	05/01/2003
All Public Plans-US Equity Segment Median	0.90	19.39	1.76	12.16	10.08	12.60	12.85	-5.83	20.32	12.87	0.28	11.41	9.52	
Rank	35	18	48	45	49	43	39	74	31	75	25	22	66	
Population	68	66	65	61	59	50	41	70	89	92	85	47	12	
International Equity	-1.51	13.08	-0.68	6.87	3.89	5.87	5.09	-14.72	29.05	4.15	-3.35	-3.77	4.97	04/01/1997
All Public Plans-Intl. Equity Segment Median	-1.39	13.19	-0.55	6.87	4.15	6.43	5.85	-13.66	28.75	4.00	-2.60	-2.97	N/A	
Rank	62	55	57	50	71	76	91	78	46	47	65	78	N/A	
Population	68	68	67	64	61	51	39	71	86	90	79	45	N/A	
Broad Fixed Income	2.33	8.31	11.00	3.33	3.83	3.37	4.95	1.72	2.80	4.09	0.59	6.30	6.17	04/01/1997
All Public Plans-US Fixed Income Segment Median	2.11	8.72	9.33	3.48	3.70	3.12	4.71	-0.24	4.49	4.54	0.21	6.01	N/A	
Rank	28	60	6	56	44	43	42	5	83	60	35	37	N/A	
Population	70	70	68	67	65	58	43	75	85	92	79	48	N/A	
Trust Funds Investment Pool	2.01	8.56	10.00	3.54	4.21	3.82	5.09	0.53	4.10	4.12	1.89	7.08	6.21	10/01/1995
All Public Plans-US Fixed Income Segment Median	2.11	8.72	9.33	3.48	3.70	3.12	4.71	-0.24	4.49	4.54	0.21	6.01	N/A	
Rank	61	54	28	48	34	32	34	22	61	59	5	25	N/A	
Population	70	70	68	67	65	58	43	75	85	92	79	48	N/A	
Real Estate	2.28	7.28	9.63	10.44	11.66	11.73	10.29	11.12	10.91	10.26	15.68	13.51	5.60	06/01/2006
All Public Plans-Real Estate Segment Median	1.65	5.49	7.17	8.88	10.61	11.56	10.45	8.64	8.84	9.91	13.42	14.67	N/A	
Rank	27	28	23	22	22	32	56	13	26	45	13	68	N/A	
Population	43	40	37	28	22	18	13	30	32	29	27	16	N/A	

Performance shown is gross of fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Equity Composites

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Domestic Large Cap Equity - Net	1.37	20.03	3.27	13.08	10.62	13.20	13.13	-4.71	21.66	11.30	1.76	13.82	8.07	12/01/2006
S&P 500 Index (Cap Wtd)	1.70	20.55	4.25	13.39	10.84	13.26	13.24	-4.38	21.83	11.96	1.38	13.69	8.31	
Difference	-0.33	-0.52	-0.98	-0.31	-0.22	-0.06	-0.11	-0.33	-0.17	-0.66	0.38	0.13	-0.24	
Domestic Large Cap Equity - Gross	1.41	20.18	3.47	13.27	10.80	13.37	13.36	-4.52	21.82	11.45	1.91	13.99	8.30	12/01/2006
IM U.S. Large Cap Equity (SA+CF) Median	1.42	20.01	3.42	12.84	10.32	13.04	13.11	-5.14	21.68	11.00	0.94	12.90	8.40	
Rank	51	47	50	43	40	38	40	44	49	47	40	32	58	
Domestic Large Cap Active - Net	0.86	19.80	1.55	12.65	10.23	13.13	12.99	-5.88	21.85	9.63	2.40	14.01	7.51	07/01/2007
S&P 500 Index (Cap Wtd)	1.70	20.55	4.25	13.39	10.84	13.26	13.24	-4.38	21.83	11.96	1.38	13.69	8.01	
Difference	-0.84	-0.75	-2.70	-0.74	-0.61	-0.13	-0.25	-1.50	0.02	-2.33	1.02	0.32	-0.50	
Domestic Large Cap Active - Gross	1.01	20.33	2.16	13.25	10.79	13.70	13.53	-5.34	22.40	10.12	2.88	14.56	8.02	07/01/2007
IM U.S. Large Cap Equity (SA+CF) Median	1.42	20.01	3.42	12.84	10.32	13.04	13.11	-5.14	21.68	11.00	0.94	12.90	8.09	
Rank	64	45	61	43	41	32	36	54	43	57	32	25	55	
Domestic Mid Cap Equity - Net	-0.09	14.72	-3.99	8.21	6.53	10.52	11.16	-10.75	19.45	12.30	-3.29	6.44	7.98	01/01/2005
Russell Mid Cap Index	0.48	21.93	3.19	10.69	9.10	12.57	13.07	-9.06	18.52	13.80	-2.44	13.22	9.15	
Difference	-0.57	-7.21	-7.18	-2.48	-2.57	-2.05	-1.91	-1.69	0.93	-1.50	-0.85	-6.78	-1.17	
Domestic Mid Cap Equity - Gross	-0.09	14.89	-3.71	8.72	7.08	11.11	11.75	-10.28	20.18	12.97	-2.71	7.07	8.49	01/01/2005
IM U.S. Mid Cap Equity (SA+CF) Median	0.07	21.53	1.88	11.67	9.55	12.79	13.25	-9.10	19.70	12.71	-1.12	9.78	9.79	
Rank	56	92	86	77	83	84	85	59	49	49	69	74	87	
Domestic Small Cap Equity - Net	-0.54	17.45	-5.54	9.66	8.92	11.67	11.91	-10.51	15.65	19.31	-1.61	5.44	11.47	03/01/2003
Russell 2000 Index	-2.40	14.18	-8.89	8.23	8.19	10.43	11.19	-11.01	14.65	21.31	-4.41	4.89	10.55	
Difference	1.86	3.27	3.35	1.43	0.73	1.24	0.72	0.50	1.00	-2.00	2.80	0.55	0.92	
Domestic Small Cap Equity - Gross	-0.45	17.80	-5.15	10.20	9.52	12.31	12.59	-10.09	16.27	19.97	-0.93	6.16	12.01	03/01/2003
IM U.S. Small Cap Equity (SA+CF) Median	-1.49	16.10	-6.87	9.19	8.85	11.62	12.46	-10.65	15.17	20.89	-2.33	5.36	11.93	
Rank	34	36	39	38	41	36	48	48	44	57	36	43	49	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all composites. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Equity Composites

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
International Large Cap Passive - Net	-1.87	11.55	-1.07	6.53	3.31	5.30	4.64	-14.04	27.79	4.87	-4.71	-3.70	6.25	06/01/2009
MSCI ACW Ex US Index (USD) (Net)	-1.80	11.56	-1.23	6.33	2.90	5.01	4.46	-14.20	27.19	4.50	-5.66	-3.87	6.02	
Difference	-0.07	-0.01	0.16	0.20	0.41	0.29	0.18	0.16	0.60	0.37	0.95	0.17	0.23	
International Large Cap Passive - Gross	-1.86	11.60	-1.01	6.60	3.39	5.38	4.72	-13.98	27.88	4.96	-4.63	-3.62	6.33	06/01/2009
International Equity Active - Net	-1.30	15.09	-0.63	6.89	4.84	6.73	5.51	-16.18	30.82	2.63	0.41	-4.39	3.48	04/01/1997
MSCI ACW Ex US Index (USD) (Net)	-1.80	11.56	-1.23	6.33	2.90	5.01	4.46	-14.20	27.19	4.50	-5.66	-3.87	N/A	
Difference	0.50	3.53	0.60	0.56	1.94	1.72	1.05	-1.98	3.63	-1.87	6.07	-0.52	N/A	
International Equity Active - Gross	-1.17	15.54	-0.10	7.46	5.38	7.26	6.03	-15.73	31.50	3.17	0.90	-3.94	4.00	04/01/1997
IM International Large Cap Core Equity (SA+CF) Median	-1.41	13.72	-1.66	6.25	3.85	6.81	6.32	-14.64	26.48	1.52	0.25	-3.70	6.48	
Rank	43	25	28	31	19	31	64	66	12	30	42	52	100	
International Value - Net	-1.69	12.38	-0.93	7.75	3.95	6.35	4.77	-13.97	30.72	5.59	-5.94	-1.49	2.04	11/01/2006
MSCI ACW Ex US Val Index (USD) (Net)	-2.80	6.94	-4.51	5.24	0.89	3.64	3.05	-13.97	22.66	8.92	-10.06	-5.10	1.74	
Difference	1.11	5.44	3.58	2.51	3.06	2.71	1.72	0.00	8.06	-3.33	4.12	3.61	0.30	
International Value - Gross	-1.56	12.81	-0.41	8.31	4.49	6.92	5.35	-13.52	31.39	6.17	-5.46	-0.94	2.62	11/01/2006
IM International Large Cap Value Equity (SA+CF) Median	-1.56	10.15	-3.42	5.84	3.05	6.24	5.91	-14.68	26.24	4.19	-2.02	-4.25	3.57	
Rank	51	26	25	10	32	39	64	39	12	29	82	15	87	
International Growth - Net	-0.63	19.66	3.81	6.81	5.29	6.37	5.57	-16.09	28.01	0.51	1.69	-6.15	3.07	11/01/2006
MSCI ACW Ex US Grth Index (USD) (Net)	-0.85	16.21	2.03	7.37	4.86	6.32	5.82	-14.43	32.01	0.12	-1.25	-2.65	3.84	
Difference	0.22	3.45	1.78	-0.56	0.43	0.05	-0.25	-1.66	-4.00	0.39	2.94	-3.50	-0.77	
International Growth - Gross	-0.49	20.15	4.39	7.42	5.88	6.93	6.13	-15.61	28.74	1.12	2.21	-5.72	3.61	11/01/2006
IM International Large Cap Growth Equity (SA+CF) Median	-1.35	16.91	0.41	7.90	5.33	7.45	7.35	-13.91	31.44	-0.09	2.31	-3.26	4.91	
Rank	29	24	20	65	42	66	78	65	69	34	51	79	82	
International Small Cap - Net	-1.88	11.36	-5.74	5.12	4.54	7.27	6.72	-18.90	33.61	1.84	5.16	-4.87	4.07	09/01/2006
MSCI ACWI Ex US Sm Cap Index IMI (USD) (Net)	-1.19	10.28	-5.63	4.64	3.98	6.22	6.13	-18.20	31.65	3.91	2.60	-4.03	4.63	
Difference	-0.69	1.08	-0.11	0.48	0.56	1.05	0.59	-0.70	1.96	-2.07	2.56	-0.84	-0.56	

Gross of fees performance is not available (N/A) for the International Small Cap composite which currently consists of DFA Intl Sm Co;I (DFISX), DFA Emg Mkts Sm Cap;I (DEMSX), BlackRock ACWI Ex-US Small Cap (CF), Templeton Investment Counsel (SA), and American Century Investment Mgmt (SA).

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all composites. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.



Montana Board of Investments
Comparative Performance
Equity Sub Composites

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Domestic Large Cap Passive - Net	1.55	20.04	4.25	13.27	10.65	13.13	13.19	-3.94	21.34	12.01	0.83	13.73	5.79	05/01/2000
S&P 500 Index (Cap Wtd)	1.70	20.55	4.25	13.39	10.84	13.26	13.24	-4.38	21.83	11.96	1.38	13.69	5.81	
Difference	-0.15	-0.51	0.00	-0.12	-0.19	-0.13	-0.05	0.44	-0.49	0.05	-0.55	0.04	-0.02	
Domestic Large Cap Passive - Gross	1.55	20.05	4.26	13.28	10.66	13.14	13.19	-3.93	21.35	12.03	0.84	13.74	5.83	05/01/2000
IM U.S. Large Cap Index Equity (SA+CF) Median	1.48	20.51	3.90	13.21	10.66	13.20	13.22	-4.78	21.71	12.03	0.95	13.27	6.02	
Rank	39	74	22	45	52	59	57	18	57	51	57	17	83	
Domestic Large Cap Enhanced - Net	1.58	21.49	4.90	14.13	11.49	13.66	13.90	-4.20	24.21	9.73	3.18	13.19	8.60	06/01/2006
S&P 500 Index (Cap Wtd)	1.70	20.55	4.25	13.39	10.84	13.26	13.24	-4.38	21.83	11.96	1.38	13.69	8.86	
Difference	-0.12	0.94	0.65	0.74	0.65	0.40	0.66	0.18	2.38	-2.23	1.80	-0.50	-0.26	
Domestic Large Cap Enhanced - Gross	1.63	21.73	5.18	14.42	11.80	13.99	14.23	-3.96	24.53	10.05	3.50	13.54	8.92	06/01/2006
IM U.S. Large Cap Core Equity (SA+CF) Median	1.58	19.91	3.38	12.56	10.29	13.16	13.08	-5.20	21.83	10.52	1.43	13.42	8.88	
Rank	48	28	32	17	16	17	14	29	20	57	25	48	48	
Domestic Large Cap 130/30 - Net	0.74	19.46	-0.20	12.03	9.47	12.97	12.67	-7.10	20.28	9.54	1.61	14.84	9.26	03/01/2008
S&P 500 Index (Cap Wtd)	1.70	20.55	4.25	13.39	10.84	13.26	13.24	-4.38	21.83	11.96	1.38	13.69	9.51	
Difference	-0.96	-1.09	-4.45	-1.36	-1.37	-0.29	-0.57	-2.72	-1.55	-2.42	0.23	1.15	-0.25	
Domestic Large Cap 130/30 - Gross	0.91	20.08	0.54	12.85	10.23	13.74	13.43	-6.32	21.10	10.22	2.26	15.59	10.00	03/01/2008
IM U.S. Large Cap Core Equity (SA+CF) Median	1.58	19.91	3.38	12.56	10.29	13.16	13.08	-5.20	21.83	10.52	1.43	13.42	9.53	
Rank	73	48	74	44	51	28	30	70	62	55	38	21	30	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all composites. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.



Montana Board of Investments
Comparative Performance
Domestic Equity Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Domestic Large Cap Equity														
BlackRock MSCI US Equity Index (SA) - Net	1.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.88	04/01/2019
MSCI US Index (USD) (Gross)	1.55	20.63	4.14	13.29	10.73	13.20	13.22	-4.50	21.90	11.61	1.32	13.36	5.90	
Difference	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.02	
BlackRock MSCI US Equity Index (SA) - Gross	1.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.88	04/01/2019
SPDR S&P 500 ETF (SPY) - Net	1.75	20.17	3.82	N/A	N/A	N/A	N/A	-5.30	N/A	N/A	N/A	N/A	11.14	07/01/2017
S&P 500 Index (Cap Wtd)	1.70	20.55	4.25	13.39	10.84	13.26	13.24	-4.38	21.83	11.96	1.38	13.69	11.76	
Difference	0.05	-0.38	-0.43	N/A	N/A	N/A	N/A	-0.92	N/A	N/A	N/A	N/A	-0.62	
Northern Trust MSCI US Index (SA) - Net	1.55	20.69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.95	11/01/2018
MSCI US Index (USD) (Gross)	1.55	20.63	4.14	13.29	10.73	13.20	13.22	-4.50	21.90	11.61	1.32	13.36	11.90	
Difference	0.00	0.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.05	
Northern Trust MSCI US Index (SA) - Gross	1.55	20.70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.96	11/01/2018
IM U.S. Large Cap Core Equity (SA+CF) Median	1.58	19.91	3.38	12.56	10.29	13.16	13.08	-5.20	21.83	10.52	1.43	13.42	11.35	
Rank	52	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	43	
Domestic Equity Pool STIF - Net	0.55	1.81	2.39	1.66	N/A	N/A	N/A	2.01	1.03	0.51	N/A	N/A	1.21	04/01/2015
Short Term Custom Index	0.52	1.72	2.30	1.66	1.12	0.85	0.67	1.95	1.15	0.52	0.21	0.16	1.22	
Difference	0.03	0.09	0.09	0.00	N/A	N/A	N/A	0.06	-0.12	-0.01	N/A	N/A	-0.01	
T. Rowe U.S. Structured Research (SA) - Net	1.58	21.49	4.90	14.17	11.58	13.75	13.46	-4.20	23.94	10.68	3.30	12.58	9.39	06/01/2006
S&P 500 Index (Cap Wtd)	1.70	20.55	4.25	13.39	10.84	13.26	13.24	-4.38	21.83	11.96	1.38	13.69	8.86	
Difference	-0.12	0.94	0.65	0.78	0.74	0.49	0.22	0.18	2.11	-1.28	1.92	-1.11	0.53	
T. Rowe U.S. Structured Research (SA) - Gross	1.63	21.73	5.18	14.45	11.88	14.07	13.79	-3.96	24.24	10.98	3.61	12.92	9.72	06/01/2006
IM U.S. Large Cap Core Equity (SA+CF) Median	1.58	19.91	3.38	12.56	10.29	13.16	13.08	-5.20	21.83	10.52	1.43	13.42	8.88	
Rank	48	28	32	17	15	16	21	29	24	46	25	59	20	
Jacobs Levy 130/30 (SA) - Net	0.65	20.78	-0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.88	04/01/2018
MSCI US Index (USD) (Gross)	1.55	20.63	4.14	13.29	10.73	13.20	13.22	-4.50	21.90	11.61	1.32	13.36	10.36	
Difference	-0.90	0.15	-4.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.48	
Jacobs Levy 130/30 (SA) - Gross	0.85	21.43	0.58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.73	04/01/2018
IM U.S. Large Cap Core Equity (SA+CF) Median	1.58	19.91	3.38	12.56	10.29	13.16	13.08	-5.20	21.83	10.52	1.43	13.42	9.05	
Rank	75	31	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	53	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Domestic Equity Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
J.P. Morgan 130/30 (SA) - Net	0.83	18.86	-0.14	12.73	9.68	13.35	12.87	-6.93	22.86	10.30	0.01	15.38	10.17	03/01/2008
S&P 500 Index (Cap Wtd)	1.70	20.55	4.25	13.39	10.84	13.26	13.24	-4.38	21.83	11.96	1.38	13.69	9.51	
Difference	-0.87	-1.69	-4.39	-0.66	-1.16	0.09	-0.37	-2.55	1.03	-1.66	-1.37	1.69	0.66	
J.P. Morgan 130/30 (SA) - Gross	0.98	19.45	0.59	13.59	10.49	14.18	13.69	-6.13	23.79	11.09	0.72	16.21	10.97	03/01/2008
IM U.S. Large Cap Core Equity (SA+CF) Median	1.58	19.91	3.38	12.56	10.29	13.16	13.08	-5.20	21.83	10.52	1.43	13.42	9.53	
Rank	72	54	73	27	45	15	23	67	27	45	59	15	11	
Domestic Mid Cap Equity														
iShares:Core S&P Md-Cp (IJH) - Net	-0.09	17.99	-2.37	N/A	N/A	N/A	N/A	-13.95	N/A	N/A	N/A	N/A	4.93	07/01/2017
S&P Mid Cap 400 Index (Cap Wtd)	-0.09	17.87	-2.49	9.38	8.88	11.81	12.56	-11.08	16.24	20.74	-2.18	9.77	6.39	
Difference	0.00	0.12	0.12	N/A	N/A	N/A	N/A	-2.87	N/A	N/A	N/A	N/A	-1.46	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Domestic Equity Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Domestic Small Cap Equity														
Vaughan Nelson Management (SA) - Net	1.72	20.68	-0.67	6.71	7.50	11.18	11.48	-13.78	6.83	20.50	0.16	9.09	8.97	03/01/2007
Russell 2000 Val Index	-0.57	12.82	-8.24	6.54	7.17	9.35	10.06	-12.86	7.84	31.74	-7.47	4.22	5.41	
Difference	2.29	7.86	7.57	0.17	0.33	1.83	1.42	-0.92	-1.01	-11.24	7.63	4.87	3.56	
Vaughan Nelson Management (SA) - Gross	1.90	21.32	0.06	7.51	8.34	12.07	12.39	-13.13	7.66	21.49	0.98	10.00	9.88	03/01/2007
IM U.S. Small Cap Value Equity (SA+CF) Median	-0.20	15.74	-6.34	7.17	7.64	10.97	11.72	-14.26	11.56	26.14	-4.29	5.71	7.53	
Rank	17	11	16	42	36	21	28	38	77	76	9	10	9	
BlackRock MSCI US Sm Cap Equity Index (CF) - Net	-1.17	17.18	-4.81	N/A	N/A	N/A	N/A	-9.96	N/A	N/A	N/A	N/A	7.12	07/01/2017
MSCI US Sm Cap Index (USD) (Net)	-1.29	16.79	-5.27	9.28	8.35	11.26	12.06	-10.40	16.75	19.15	-4.11	7.07	6.63	
Difference	0.12	0.39	0.46	N/A	N/A	N/A	N/A	0.44	N/A	N/A	N/A	N/A	0.49	
BlackRock MSCI US Sm Cap Equity Index (CF) - Gross	-1.16	17.20	-4.78	N/A	N/A	N/A	N/A	-9.93	N/A	N/A	N/A	N/A	7.16	07/01/2017
DFA US Small Cap Trust (CF) - Net	-1.54	12.56	-9.41	7.31	7.93	10.86	12.01	-12.27	11.86	24.42	-2.64	4.75	11.39	03/01/2003
Russell 2000 Index	-2.40	14.18	-8.89	8.23	8.19	10.43	11.19	-11.01	14.65	21.31	-4.41	4.89	10.55	
Difference	0.86	-1.62	-0.52	-0.92	-0.26	0.43	0.82	-1.26	-2.79	3.11	1.77	-0.14	0.84	
DFA US Small Cap Trust (CF) - Gross	-1.46	12.84	-9.09	7.69	8.30	11.25	12.40	-11.95	12.25	24.85	-2.29	5.12	11.71	03/01/2003
IM U.S. Small Cap Core Equity (SA+CF) Median	-1.64	15.62	-7.24	9.19	9.10	11.85	12.64	-10.73	15.18	20.77	-1.35	6.72	11.72	
Rank	47	68	68	68	66	59	54	63	72	21	62	65	51	
iShares:Russ 2000 ETF (IWM) - Net	-2.33	14.25	-8.90	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.54	05/01/2018
Russell 2000 Index	-2.40	14.18	-8.89	8.23	8.19	10.43	11.19	-11.01	14.65	21.31	-4.41	4.89	0.57	
Difference	0.07	0.07	-0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.03	

Gross of fees performance is not available (N/A) for the following funds: SPDR S&P 500 ETF (SPY), iShares:Core S&P Md-Cp (IJH), and iShares:Russ 2000 ETF (IWM).

The current annual expense ratios for the SPDR S&P 500 ETF (SPY), iShares:Core S&P Md-Cp (IJH), and iShares:Russ 2000 ETF (IWM) are 0.09%, 0.07%, and 0.19%, respectively.

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
International Equity Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
International Developed Large Cap Equity														
Acadian Asset Non-US Equity (SA) - Net	-1.59	10.60	-4.22	9.94	5.31	7.49	6.74	-13.44	34.76	12.40	-7.75	0.00	2.99	11/01/2006
MSCI ACW Ex US Val Index (USD) (Net)	-2.80	6.94	-4.51	5.24	0.89	3.64	3.05	-13.97	22.66	8.92	-10.06	-5.10	1.74	
Difference	1.21	3.66	0.29	4.70	4.42	3.85	3.69	0.53	12.10	3.48	2.31	5.10	1.25	
Acadian Asset Non-US Equity (SA) - Gross	-1.46	11.02	-3.72	10.51	5.86	8.05	7.32	-12.99	35.45	13.01	-7.26	0.52	3.57	11/01/2006
IM ACWI Ex US Value (SA+CF) Median	-2.30	10.12	-3.83	6.08	2.91	5.66	5.91	-14.89	26.02	4.87	-3.25	-3.87	3.45	
Rank	19	41	50	3	16	18	21	24	8	10	85	15	48	
Lazard Asset Management (SA) - Net	-1.76	13.59	1.38	5.71	N/A	N/A	N/A	-14.32	27.00	0.22	N/A	N/A	2.82	06/01/2015
Lazard Custom Index	-1.80	11.56	-1.23	6.08	1.37	4.00	3.30	-15.55	22.66	8.92	-10.06	-5.10	1.58	
Difference	0.04	2.03	2.61	-0.37	N/A	N/A	N/A	1.23	4.34	-8.70	N/A	N/A	1.24	
Lazard Asset Management (SA) - Gross	-1.63	14.03	1.90	6.27	N/A	N/A	N/A	-13.88	27.65	0.77	N/A	N/A	3.36	06/01/2015
IM ACWI Ex US Value (SA+CF) Median	-2.30	10.12	-3.83	6.08	2.91	5.66	5.91	-14.89	26.02	4.87	-3.25	-3.87	2.26	
Rank	22	20	9	42	N/A	N/A	N/A	33	38	86	N/A	N/A	40	
BlackRock ACWI Ex-US SuperFund A (CF) - Net	-1.79	11.78	-1.03	6.58	3.13	5.23	4.67	-13.99	27.49	4.77	-5.49	-3.73	6.24	06/01/2009
MSCI ACW Ex US Index (USD) (Net)	-1.80	11.56	-1.23	6.33	2.90	5.01	4.46	-14.20	27.19	4.50	-5.66	-3.87	6.02	
Difference	0.01	0.22	0.20	0.25	0.23	0.22	0.21	0.21	0.30	0.27	0.17	0.14	0.22	
BlackRock ACWI Ex-US SuperFund A (CF) - Gross	-1.77	11.84	-0.96	6.66	3.21	5.31	4.75	-13.93	27.58	4.86	-5.42	-3.65	6.32	06/01/2009
IM All ACWI Ex US (SA+CF) Median	-1.70	13.87	-1.12	7.01	4.41	6.97	6.58	-14.75	28.74	2.06	-0.59	-3.40	7.97	
Rank	52	70	49	56	71	85	86	42	62	25	84	54	86	
iShares:MSCI EAFE ETF (EFA) - Net	-0.79	13.28	-0.93	N/A	N/A	N/A	N/A	-12.88	N/A	N/A	N/A	N/A	3.31	07/01/2017
MSCI EAFE Index (USD) (Net)	-1.07	12.80	-1.34	6.48	3.27	6.12	4.90	-13.79	25.03	1.00	-0.81	-4.90	2.98	
Difference	0.28	0.48	0.41	N/A	N/A	N/A	N/A	0.91	N/A	N/A	N/A	N/A	0.33	
Baillie Gifford (SA) - Net	-1.31	18.89	-0.04	6.32	N/A	N/A	N/A	-17.35	31.99	0.73	N/A	N/A	4.56	06/01/2015
MSCI ACW Ex US Grth Index (USD) (Net)	-0.85	16.21	2.03	7.37	4.86	6.32	5.82	-14.43	32.01	0.12	-1.25	-2.65	4.28	
Difference	-0.46	2.68	-2.07	-1.05	N/A	N/A	N/A	-2.92	-0.02	0.61	N/A	N/A	0.28	
Baillie Gifford (SA) - Gross	-1.19	19.32	0.46	6.85	N/A	N/A	N/A	-16.93	32.66	1.28	N/A	N/A	5.10	06/01/2015
IM ACWI Ex US Growth (SA+CF) Median	-1.14	18.37	0.90	7.84	5.78	7.49	7.49	-14.05	32.56	-0.76	1.29	-1.66	4.69	
Rank	51	29	54	83	N/A	N/A	N/A	85	49	33	N/A	N/A	46	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. See the Addendum for custom index specification.

Montana Board of Investments
Comparative Performance
International Equity Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Invesco (SA) - Net	-0.14	20.21	6.70	7.15	N/A	N/A	N/A	-15.17	24.92	0.32	N/A	N/A	3.70	06/01/2015
MSCI ACW Ex US Grth Index (USD) (Net)	-0.85	16.21	2.03	7.37	4.86	6.32	5.82	-14.43	32.01	0.12	-1.25	-2.65	4.28	
Difference	0.71	4.00	4.67	-0.22	N/A	N/A	N/A	-0.74	-7.09	0.20	N/A	N/A	-0.58	
Invesco (SA) - Gross	0.00	20.74	7.34	7.81	N/A	N/A	N/A	-14.64	25.70	1.01	N/A	N/A	4.36	06/01/2015
IM ACWI Ex US Growth (SA+CF) Median	-1.14	18.37	0.90	7.84	5.78	7.49	7.49	-14.05	32.56	-0.76	1.29	-1.66	4.69	
Rank	18	21	9	57	N/A	N/A	N/A	54	91	36	N/A	N/A	60	
International Equity Pool STIF - Net	0.55	1.78	2.36	1.59	N/A	N/A	N/A	1.94	0.92	0.47	N/A	N/A	1.15	04/01/2015
Short Term Custom Index	0.52	1.72	2.30	1.66	1.12	0.85	0.67	1.95	1.15	0.52	0.21	0.16	1.22	
Difference	0.03	0.06	0.06	-0.07	N/A	N/A	N/A	-0.01	-0.23	-0.05	N/A	N/A	-0.07	
International Developed Small Cap Equity														
American Century Investment Mgmt (SA) - Net	-1.93	15.22	-8.27	6.52	6.08	N/A	N/A	-20.76	43.80	-5.31	11.32	N/A	3.99	03/01/2014
MSCI ACW Ex US Sm Cap Grth Index (USD) (Net)	-1.34	12.07	-5.61	4.76	4.63	6.27	6.67	-18.27	33.64	-0.28	6.50	-3.59	3.48	
Difference	-0.59	3.15	-2.66	1.76	1.45	N/A	N/A	-2.49	10.16	-5.03	4.82	N/A	0.51	
American Century Investment Mgmt (SA) - Gross	-1.73	15.92	-7.50	7.41	6.98	N/A	N/A	-20.09	44.99	-4.49	12.25	N/A	4.87	03/01/2014
IM ACWI Ex US Growth (SA+CF) Median	-1.14	18.37	0.90	7.84	5.78	7.49	7.49	-14.05	32.56	-0.76	1.29	-1.66	4.69	
Rank	65	69	100	75	27	N/A	N/A	100	6	79	1	N/A	46	
BlackRock ACWI Ex-US Small Cap (CF) - Net	-1.05	10.60	-5.27	4.97	4.35	6.51	N/A	-17.85	31.96	4.26	2.87	-3.84	6.46	02/01/2012
MSCI ACWI Ex US Sm Cap Index IMI (USD) (Net)	-1.19	10.28	-5.63	4.64	3.98	6.22	6.13	-18.20	31.65	3.91	2.60	-4.03	6.19	
Difference	0.14	0.32	0.36	0.33	0.37	0.29	N/A	0.35	0.31	0.35	0.27	0.19	0.27	
BlackRock ACWI Ex-US Small Cap (CF) - Gross	-1.02	10.70	-5.16	5.11	4.50	6.68	N/A	-17.74	32.15	4.44	3.04	-3.67	6.63	02/01/2012
DFA Intl Sm Co;l (DFISX) - Net	-1.48	10.64	-7.64	4.37	4.48	7.45	6.87	-19.41	30.24	5.74	5.89	-6.29	7.11	11/01/2004
MSCI Wrld Ex US Sm Cap Index (USD) (Net)	-0.27	12.58	-5.62	5.54	5.14	7.48	6.93	-18.07	31.04	4.32	5.46	-5.35	6.78	
Difference	-1.21	-1.94	-2.02	-1.17	-0.66	-0.03	-0.06	-1.34	-0.80	1.42	0.43	-0.94	0.33	
Templeton Investment Counsel (SA) - Net	-1.86	12.98	-3.67	5.66	3.94	N/A	N/A	-18.48	33.07	-1.13	1.81	N/A	3.06	03/01/2014
Templeton Custom Index	-1.19	10.28	-5.63	4.38	3.24	6.10	5.55	-19.75	29.72	8.24	-1.25	-4.49	2.32	
Difference	-0.67	2.70	1.96	1.28	0.70	N/A	N/A	1.27	3.35	-9.37	3.06	N/A	0.74	
Templeton Investment Counsel (SA) - Gross	-1.66	13.69	-2.85	6.57	4.85	N/A	N/A	-17.78	34.21	-0.23	2.73	N/A	3.97	03/01/2014
IM ACWI Ex US Value (SA+CF) Median	-2.30	10.12	-3.83	6.08	2.91	5.66	5.91	-14.89	26.02	4.87	-3.25	-3.87	2.80	
Rank	22	20	41	39	31	N/A	N/A	84	8	89	9	N/A	27	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. See the Addendum for custom index specification.

Montana Board of Investments
Comparative Performance
International Equity Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
International Emerging Equity														
BlackRock Emerging Mkts (CF) - Net	-4.28	5.71	-2.21	5.78	2.11	2.18	N/A	-14.69	37.05	10.85	-15.15	-2.49	2.04	02/01/2012
MSCI Emg Mkts Index (USD) (Net)	-4.25	5.90	-2.02	5.97	2.33	2.41	3.37	-14.58	37.28	11.19	-14.92	-2.19	2.28	
Difference	-0.03	-0.19	-0.19	-0.19	-0.22	-0.23	N/A	-0.11	-0.23	-0.34	-0.23	-0.30	-0.24	
BlackRock Emerging Mkts (CF) - Gross	-4.25	5.80	-2.10	5.89	2.25	2.34	N/A	-14.60	37.16	11.08	-14.99	-2.30	2.21	02/01/2012
iShares:MSCI Em Mkts (EEM) - Net	-4.75	5.39	-2.61	N/A	N/A	N/A	N/A	-16.45	36.86	N/A	N/A	N/A	7.02	01/01/2017
MSCI Emg Mkts Index (USD) (Net)	-4.25	5.90	-2.02	5.97	2.33	2.41	3.37	-14.58	37.28	11.19	-14.92	-2.19	8.20	
Difference	-0.50	-0.51	-0.59	N/A	N/A	N/A	N/A	-1.87	-0.42	N/A	N/A	N/A	-1.18	
DFA Emg Mkts Sm Cap;I (DEMSX) - Net	-4.75	4.43	-1.51	N/A	N/A	N/A	N/A	-17.56	N/A	N/A	N/A	N/A	3.65	02/01/2017
MSCI Emg Mkts Sm Cap Index (USD) (Net)	-4.58	1.82	-5.49	1.32	-0.13	1.81	3.21	-18.59	33.84	2.28	-6.85	1.01	2.20	
Difference	-0.17	2.61	3.98	N/A	N/A	N/A	N/A	1.03	N/A	N/A	N/A	N/A	1.45	

Gross of fees performance is not available (N/A) for the following funds: iShares:MSCI EAFE ETF (EFA), International Equity Pool STIF, DFA Intl Sm Co;I (DFISX), iShares:MSCI Em Mkts (EEM), and DFA Emg Mkts Sm Cap;I (DEMSX).

The current annual expense ratios for the iShares:MSCI EAFE ETF (EFA), DFA Intl Sm Co;I (DFISX), iShares:MSCI Em Mkts (EEM), and DFA Emg Mkts Sm Cap;I (DEMSX) are 0.31%, 0.53%, 0.67%, and 0.70%, respectively.

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. See the Addendum for custom index specification.

Montana Board of Investments
Comparative Performance
Fixed Income Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Reams Asset Core Plus (SA) - Net	2.32	8.08	10.74	3.17	3.62	3.00	4.67	1.31	3.21	4.18	0.07	4.47	5.64	10/01/2008
Reams Custom Index	2.27	8.52	10.30	3.15	3.57	3.02	4.11	0.01	3.83	3.91	0.43	5.56	4.71	
Difference	0.05	-0.44	0.44	0.02	0.05	-0.02	0.56	1.30	-0.62	0.27	-0.36	-1.09	0.93	
Reams Asset Core Plus (SA) - Gross	2.37	8.23	10.95	3.35	3.80	3.18	4.86	1.49	3.38	4.35	0.24	4.65	5.83	10/01/2008
IM U.S. Broad Market Core+ FI (SA+CF) Median	2.34	9.50	10.40	3.89	3.95	3.64	5.20	-0.36	4.82	4.67	0.31	6.19	6.01	
Rank	41	88	22	82	66	83	69	4	95	57	53	90	61	
Neuberger Berman High Yield (SA) - Net	1.72	11.09	6.54	5.17	4.70	5.32	N/A	-1.99	5.80	14.98	-4.32	1.93	7.10	01/01/2010
Bloomberg US HY 2% Issuer Cap Index	1.33	11.41	6.35	6.07	5.38	5.89	7.92	-2.08	7.50	17.13	-4.43	2.46	7.47	
Difference	0.39	-0.32	0.19	-0.90	-0.68	-0.57	N/A	0.09	-1.70	-2.15	0.11	-0.53	-0.37	
Neuberger Berman High Yield (SA) - Gross	1.83	11.46	7.01	5.64	5.17	5.79	N/A	-1.56	6.27	15.50	-3.89	2.38	7.59	01/01/2010
IM U.S. High Yield Bonds (SA+CF) Median	1.39	11.47	6.37	6.11	5.25	5.87	7.87	-1.69	7.52	14.09	-2.11	2.61	7.48	
Rank	23	51	38	70	53	59	N/A	48	78	33	75	55	40	
Oaktree U.S. High Yield (SA) (CAPP) - Net	2.00	12.65	6.98	N/A	N/A	N/A	N/A	-3.99	N/A	N/A	N/A	N/A	4.58	01/01/2018
Bloomberg US HY 2% Issuer Cap Index	1.33	11.41	6.35	6.07	5.38	5.89	7.92	-2.08	7.50	17.13	-4.43	2.46	5.09	
Difference	0.67	1.24	0.63	N/A	N/A	N/A	N/A	-1.91	N/A	N/A	N/A	N/A	-0.51	
Oaktree U.S. High Yield (SA) (CAPP) - Gross	2.13	13.06	7.51	N/A	N/A	N/A	N/A	-3.47	N/A	N/A	N/A	N/A	5.12	01/01/2018
IM U.S. High Yield Bonds (SA+CF) Median	1.39	11.47	6.37	6.11	5.25	5.87	7.87	-1.69	7.52	14.09	-2.11	2.61	5.16	
Rank	12	9	26	N/A	N/A	N/A	N/A	92	N/A	N/A	N/A	N/A	54	
Shenkman High Yield Fixed Income (SA) (CAPP) - Net	1.91	11.13	7.10	N/A	N/A	N/A	N/A	-1.96	N/A	N/A	N/A	N/A	4.56	12/01/2017
Bloomberg US HY 2% Issuer Cap Index	1.33	11.41	6.35	6.07	5.38	5.89	7.92	-2.08	7.50	17.13	-4.43	2.46	5.03	
Difference	0.58	-0.28	0.75	N/A	N/A	N/A	N/A	0.12	N/A	N/A	N/A	N/A	-0.47	
Shenkman High Yield Fixed Income (SA) (CAPP) - Gross	2.04	11.50	7.60	N/A	N/A	N/A	N/A	-1.46	N/A	N/A	N/A	N/A	5.07	12/01/2017
IM U.S. High Yield Bonds (SA+CF) Median	1.39	11.47	6.37	6.11	5.25	5.87	7.87	-1.69	7.52	14.09	-2.11	2.61	5.13	
Rank	14	48	25	N/A	N/A	N/A	N/A	45	N/A	N/A	N/A	N/A	56	
High Yield Pool STIF - Net	0.55	1.77	2.35	N/A	N/A	N/A	N/A	1.91	N/A	N/A	N/A	N/A	3.66	05/01/2017
Short Term Custom Index	0.52	1.72	2.30	1.66	1.12	0.85	0.67	1.95	1.15	0.52	0.21	0.16	1.87	
Difference	0.03	0.05	0.05	N/A	N/A	N/A	N/A	-0.04	N/A	N/A	N/A	N/A	1.79	
Broad Fixed Income STIF - Net	0.55	1.78	2.36	3.41	2.15	1.66	1.25	2.03	6.21	0.78	0.20	0.48	0.91	10/01/2008
Short Term Custom Index	0.52	1.72	2.30	1.66	1.12	0.85	0.67	1.95	1.15	0.52	0.21	0.16	0.67	
Difference	0.03	0.06	0.06	1.75	1.03	0.81	0.58	0.08	5.06	0.26	-0.01	0.32	0.24	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. Post Trad'I High Yield (CF) was liquidated while Oaktree US High Yield Fixed Income (SA) and Shenkman High Yield Fixed Income (SA) were funded in the Trust Fund Investment Pool during Q3 2019.



Montana Board of Investments
Comparative Performance
Fixed Income Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Trust Funds Investment Pool Internally Managed	2.13	8.69	10.44	3.22	3.79	3.26	4.56	0.30	3.78	3.41	1.03	6.79	5.95	10/01/1995
Bloomberg US Agg Bond Index	2.27	8.52	10.30	2.92	3.38	2.72	3.75	0.01	3.54	2.65	0.55	5.97	5.23	
Difference	-0.14	0.17	0.14	0.30	0.41	0.54	0.81	0.29	0.24	0.76	0.48	0.82	0.72	
Trust Funds Investment Pool Internally Managed	2.13	8.69	10.44	3.22	3.79	3.26	4.56	0.30	3.78	3.41	1.03	6.79	5.95	10/01/1995
IM U.S. Broad Market Core Fixed Income (SA+CF) Median	2.33	8.99	10.47	3.35	3.72	3.13	4.34	0.07	4.06	3.12	0.83	6.17	5.63	
Rank	88	65	52	63	47	39	32	30	66	44	29	25	14	
Shenkman Capital High Yield (SA) (TFIP) - Net	1.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.57	07/01/2019
Bloomberg US HY 2% Issuer Cap Index	1.33	11.41	6.35	6.07	5.38	5.89	7.92	-2.08	7.50	17.13	-4.43	2.46	1.33	
Difference	0.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.24	
Shenkman Capital High Yield (SA) (TFIP) - Gross	1.65	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.65	07/01/2019
IM U.S. High Yield Bonds (SA+CF) Median	1.39	11.47	6.37	6.11	5.25	5.87	7.87	-1.69	7.52	14.09	-2.11	2.61	1.39	
Rank	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35	
Oaktree Capital Management (SA) (TFIP) - Net	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.69	08/01/2019
Bloomberg US HY 2% Issuer Cap Index	1.33	11.41	6.35	6.07	5.38	5.89	7.92	-2.08	7.50	17.13	-4.43	2.46	0.77	
Difference	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.92	
Oaktree Capital Management (SA) (TFIP) - Gross	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.73	08/01/2019
IM U.S. High Yield Bonds (SA+CF) Median	1.39	11.47	6.37	6.11	5.25	5.87	7.87	-1.69	7.52	14.09	-2.11	2.61	0.87	
Rank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7	

Trust Funds Investment Pool Internally Managed is part of the Trust Funds Investment Pool.

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. Post Trad'l High Yield (CF) was liquidated while Oaktree US High Yield Fixed Income (SA) and Shenkman High Yield Fixed Income (SA) were funded in the Trust Fund Investment Pool during Q3 2019.



Montana Board of Investments
 Comparative Performance
 Diversifying Strategies Managers

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Long U.S. Treasuries Portfolio	7.75	19.21	24.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14.69	03/01/2018
Bloomberg 20+ Yr Trsy Strips Index	11.99	28.43	34.30	5.26	9.40	6.51	9.53	-4.07	13.66	1.41	-3.74	46.38	20.75	
Difference	-4.24	-9.22	-10.27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-6.06	
Long U.S. Treasuries Portfolio	7.75	19.21	24.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14.69	03/01/2018
IM U.S. Long Duration (SA+CF) Median	6.34	21.36	21.63	5.97	7.06	5.83	8.04	-4.73	11.24	7.46	-3.33	18.36	12.95	
Rank	2	85	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	
Diversifying Strategies Pool STIF	0.55	1.77	2.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.37	10/01/2018
Short Term Custom Index	0.52	1.72	2.30	1.66	1.12	0.85	0.67	1.95	1.15	0.52	0.21	0.16	2.30	
Difference	0.03	0.05	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.07	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. GMO:Bchmk-Fr All;III (GBMFX) and PIMCO:All Asset;Inst (PAAIX) were liquidated during Q3 2019.



Montana Board of Investments
Comparative Performance
Trust Accounts

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Abandoned Mine Trust	0.59	1.93	2.59	1.62	1.46	1.31	1.77	1.85	1.04	1.10	0.90	1.49	4.02	12/01/1993
Belt Water Treatment Plant Fund	1.88	8.12	9.48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.42	03/01/2018
Big Sky Economic Development Fund	1.91	8.22	9.58	3.38	4.05	3.66	4.92	0.48	3.97	3.98	1.82	6.77	5.02	07/01/2005
Butte Area One Restoration	1.52	6.31	7.62	2.97	3.05	2.59	3.18	1.24	2.92	2.60	1.20	3.57	3.43	11/01/2008
Clark Fork River Restoration	1.61	6.58	7.72	2.97	3.13	2.72	3.48	0.96	2.85	2.72	1.37	4.26	3.78	11/01/2008
Coal Tax Cultural Trust Fund	1.90	8.19	9.55	3.37	4.03	3.64	4.90	0.47	3.96	3.95	1.79	6.79	6.10	12/01/1993
Coal Tax Park Acquisition	1.89	8.17	9.53	3.36	4.01	3.61	4.89	0.48	3.96	3.90	1.78	6.66	6.07	12/01/1993
East Helena Compensation Fund	1.27	5.06	6.03	2.57	2.53	N/A	N/A	1.20	2.56	2.12	0.91	3.01	2.17	01/01/2013
Endowment for Children	1.87	8.09	9.43	3.34	3.91	3.54	4.80	0.46	3.89	3.66	1.70	6.66	5.09	08/01/2007
FWP License Account	0.76	2.86	3.60	1.77	1.41	1.15	1.28	1.50	1.11	0.84	0.61	0.59	3.00	11/01/1997
FWP Mitigation Trust Fund	1.21	4.97	6.04	2.26	1.84	1.56	1.93	1.14	1.15	0.67	0.87	1.37	3.95	12/01/1993
FWP Real Property Trust	1.90	8.17	9.52	3.35	3.95	3.55	4.74	0.51	3.80	3.82	1.73	6.47	5.45	12/01/1993
Group Benefits	0.89	3.53	4.41	1.97	1.76	1.44	1.74	1.37	1.30	1.16	1.06	1.17	3.94	12/01/1993
Harold Hamm Endowment	1.86	8.00	9.34	3.23	N/A	N/A	N/A	0.57	1.11	N/A	N/A	N/A	3.03	07/01/2016
Montana Pole	1.68	7.02	8.23	3.06	3.48	3.10	4.12	0.74	3.38	3.23	1.56	5.44	5.19	09/01/1996
Montana State University	0.70	2.40	3.08	1.87	1.45	1.16	1.19	1.87	1.39	0.95	0.39	0.85	2.07	08/01/2004
Montana Tech-UM Agency Funds	0.63	2.09	2.71	1.77	1.26	0.97	0.88	1.91	1.22	0.72	0.27	0.35	1.85	03/01/2003
MT BOI - Clark Fork Site	1.79	7.55	8.83	3.21	3.70	3.25	4.12	0.67	3.64	3.63	1.56	5.37	4.43	11/01/2008
MT BOI UOFM Other	1.14	4.07	5.11	2.28	2.33	1.97	2.14	1.42	2.15	2.34	1.13	2.57	3.02	08/01/2002
MUS Group Insurance	0.79	2.92	3.68	1.96	1.82	1.44	N/A	1.96	1.09	1.33	1.26	1.30	1.47	10/01/2011
MUS Workers Compensation	1.06	3.97	4.80	2.30	N/A	N/A	N/A	1.62	1.80	N/A	N/A	N/A	2.18	04/01/2016

Performance shown is gross of fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Trust Accounts

As of September 30, 2019

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2018	2017	2016	2015	2014	Since Incep.	Inception Date
Older Montanans Trust	1.92	8.16	9.51	3.36	3.97	3.58	4.57	0.49	3.87	3.86	1.72	6.57	4.90	08/01/2007
Permanent Coal Trust Excl Crp	1.46	6.28	7.43	3.20	3.74	3.57	4.58	1.28	3.49	3.79	2.23	6.14	5.79	12/01/1993
PERS Defined Cont Disability	0.84	13.96	3.98	7.66	N/A	N/A	N/A	-4.88	14.57	3.42	N/A	N/A	6.35	09/01/2015
Potter Trust Fund	1.86	8.01	9.36	3.31	N/A	N/A	N/A	0.51	3.87	N/A	N/A	N/A	3.71	06/01/2016
Resource Indemnity Trust	1.96	8.43	9.82	3.43	4.11	3.71	4.94	0.44	4.01	4.02	1.82	6.94	6.18	12/01/1993
School Facilities Fund	1.85	7.46	8.61	N/A	N/A	N/A	N/A	-0.13	N/A	N/A	N/A	N/A	4.12	01/01/2018
Smelter Hill Up Restorative	1.29	5.18	6.19	2.64	2.39	2.01	2.22	1.57	1.85	1.79	0.92	2.49	2.33	11/01/2008
State Fund Insurance	1.22	7.90	7.52	3.99	4.08	3.95	4.93	0.38	5.05	3.50	2.21	5.00	5.61	12/01/1993
Streamside Tailings Operable Unit	1.78	7.47	8.72	3.18	3.74	3.37	4.44	0.57	3.69	3.58	1.69	6.22	5.41	02/01/1999
Subsequent Injury Fund	0.56	1.81	2.40	1.69	1.15	0.86	1.04	1.98	1.11	0.61	0.22	0.11	3.09	12/01/1993
Tobacco Trust Fund	1.91	8.21	9.59	3.35	4.05	3.67	4.93	0.46	3.96	3.99	1.82	6.89	5.71	01/01/2001
Treasurers	0.56	1.81	2.40	1.67	1.17	0.90	0.73	1.97	1.07	0.68	0.27	0.19	2.92	12/01/1993
Treasure State Endowment	1.94	8.35	9.73	3.42	4.08	3.69	4.95	0.46	4.00	3.98	1.82	6.84	6.04	12/01/1993
Treasure State Reg. Water System	1.94	8.35	9.73	3.42	4.07	3.68	4.93	0.45	4.00	3.96	1.82	6.80	5.86	06/01/2000
Trust and Legacy Account	1.94	8.39	9.78	3.41	4.09	3.70	4.94	0.43	4.00	4.01	1.82	6.92	6.77	07/01/1991
UCFRB Assess/Litig Cost Rec	1.87	8.05	9.39	3.31	3.89	3.51	4.56	0.49	3.77	3.84	1.65	6.40	5.78	07/01/1999
UCFRB Restoration Fund	1.91	8.06	9.45	3.42	3.87	3.47	4.69	0.67	3.73	3.52	1.70	6.28	5.68	06/01/1999
Upper Blackfoot Response	0.95	3.76	4.59	2.17	2.05	1.66	N/A	1.49	1.90	1.74	0.84	1.59	1.68	09/01/2010
Weed Control Trust	1.96	8.43	9.82	3.43	4.11	3.71	4.81	0.44	4.01	4.02	1.82	6.94	5.31	12/01/1993
Wildlife Habitat Trust	1.87	8.09	9.44	3.32	3.91	3.53	4.73	0.51	3.78	3.79	1.73	6.49	5.45	12/01/1993
Zortman/Landusky LT H2O	0.56	1.81	2.40	1.64	1.56	1.22	3.51	1.98	1.01	1.36	0.84	1.78	6.63	09/01/1999
Z/L Long Term H2O Trust Fund	0.56	1.81	2.40	1.66	1.62	1.19	3.24	1.98	1.08	1.39	1.15	1.76	4.44	09/01/2005

Performance shown is gross of fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Performance Notes

- All gross and net performance data is provided by State Street Analytics (SSA). Reported gross returns for the retirement plans prior to 07/01/2002 are net of all fees.
- Gross performance for the retirement plans is calculated with fee accruals provided by Montana's Accounting department.
- Gross of fees performance is not available (N/A) for the following funds: SPDR S&P 500 ETF (SPY), Domestic Equity Pool STIF, iShares:Core S&P Md-Cp (IJH), iShares:Russ 2000 ETF (IWM), DFA Intl Sm Co;I (DFISX), iShares:MSCI EAFE ETF (EFA), International Equity Pool STIF, iShares:MSCI Em Mkts (EEM), and DFA Emg Mkts Sm Cap;I (DEMSX). The current annual expense ratios are as listed below.

Index Notes

- Retirement plan custom benchmarks are provided by State Street Bank and are calculated daily using actual allocations.
- The CAPP Custom Benchmark consists of the portfolio weighted average of the primary benchmark for each CAPP asset class.
- The Short Term Custom Benchmark consists of 100% ICE 1 Mo LIBOR Index (USD) through 4/30/2018, and 100% Federal Reserve US Treasury 1 Mo Constant Maturity Index thereafter.
- The Domestic Equity Custom Index consists of 100% S&P 1500 Comp Index through 04/30/2017 and 100% MSCI USA IM Index (USD) (Gross) thereafter.
- The International Equity Custom Index consists of 100% MSCI EAFE Index (USD) (Net) through 10/31/2006, 100% MSCI ACW Ex US Index (USD) (Net) through 06/30/2007, 92.5% MSCI ACW Ex US Index (USD) (Net) and 7.5% MSCI ACW Ex US SC IM Index (USD) (Net) through 02/28/2014, and 100% MSCI ACW Ex-US IM Index thereafter.
- The Real Estate Custom Index consists of 100% NCREIF ODCE Index (AWA) (Net) (1 Qtr Lag) through 03/31/2017 and 100% MSCI US REIT Index (USD) (Gross) thereafter.
- The Private Equity Custom Index consists of 100% S&P 1500 Comp Index+4% (1 Qtr Lag) through 04/30/2017 and 100% MSCI US Small Cap Index (USD) (Gross) thereafter.
- The Lazard Custom Index consists of 100% MSCI ACW Ex US Value Index (USD) (Net) through 6/30/2018 and 100% MSCI ACW Ex US Index (USD) (Net) thereafter.
- The Templeton Custom Index consists of 100% MSCI ACW Ex US Small Cap Value Index (USD) (Net) through 5/31/2018, and 100% MSCI ACW Ex US Small Cap Index (USD) (Net) thereafter.
- The Reams Custom Index consists of 100% Bloomberg US Unv Bond Index through 03/31/2017 and 100% Bloomberg US Agg Bond Index thereafter.

Trust Accounts Comments

- The Belt Water Treatment Plant Fund was added in 03/2018.
- The School Facilities Fund was added in 01/2018.
- The Potter Trust Fund and the Harold Hamm Endowment were added in 06/2016.
- MUS Workers Compensation was added in 04/2016.

Manager Transition Comments

- Post High Yield Plus (SA), GMO:Bchmk-Fr All;III (GBMFX), and PIMCO:All Asset;Inst (PAAIX) were liquidated during Q3 2019.
- Oaktree US High Yield Fixed Income (SA) and Shenkman High Yield Fixed Income (SA) were funded in the Trust Fund Investment Pool during Q3 2019.
- Artisan Partners (SA), Iridian Asset Management (SA), Congress Mid Cap Growth (SA), TimeSquare Capital Management (SA), and Alliance Bernstein (SA) were liquidated in Q2 2019.
- BlackRock MSCI US Equity Index (CF) was transitioned into a separately managed account during Q1 2019.
- Northern Trust MSCI US Equity Index (SA), GMO:Bchmk-Fr All;III (GBMFX), and PIMCO:All Asset;Inst (PAAIX) were funded during Q4 2018.
- Voya Investment Management (SA) was liquidated in 07/2018.
- iShares:Russ 2000 ETF (IWM) was funded in 04/2018.
- Jacobs Levy 130/30 Large Cap (SA) was funded in 03/2018.
- Congress Mid Cap Growth (SA) was funded in 02/2018.
- Oaktree U.S. High Yield (SA) and Shenkman High Yield Fixed Income (SA) were funded in 12/2017.
- Analytic Investors 130/30 (SA) was liquidated in 09/2017.
- BlackRock MSCI US Equity Index (CF), BlackRock MSCI US Sm Cap Equity Index (CF), and iShares:Core S&P Md-Cp (IJH) were funded in 06/2017.
- SPDR S&P 500 ETF (SPY) and iShares:MSCI EAFE ETF (EFA) were re-funded in 06/2017.
- INTECH Enhanced Plus was liquidated in 06/2017.
- Residual assets from the liquidation of AllianceBernstein Int'l Value (SA), Martin Currie (SA), Hansberger Global Investors (SA), and Aberdeen Total Return Bond Strategy (SA) were distributed in 06/2017.
- BlackRock Equity Index Fund A (CF) and BlackRock Mid Cap Equity Index A (CF) were liquidated in 05/2017.
- DFA Emg Mkts Sm Cap;I (DEMSX) was funded in 02/2017.
- SPDR S&P 500 ETF (SPY) was liquidated in 01/2017.
- iShares:MSCI Em Mkts (EEM) was funded in 12/2016.

- SPDR S&P 500 ETF (SPY) was initially funded in 09/2015, was then liquidated in 12/2015, and was re-funded in 10/2016.

Manager Transition Comments (cont.)

- Wells Capital Management (SA), Domestic Equity Pool SPIF, and International Equity Pool SPIF were liquidated in 10/2016. Wells Capital Management (SA) residual assets from liquidation were distributed in 03/2017.
- Nicholas Investment Partners was liquidated in 07/2016. Residual assets from liquidation were distributed in 03/2017.
- Effective 07/2016, the Metropolitan West Capital Management legal entity merged into the Wells Capital Management Incorporated legal entity. The Metropolitan West Capital Mgmt (SA) has been updated to Wells Capital Management (SA) to reflect the change.
- iShares S&P SmallCap 600 Index ETF (IJR) was liquidated in 01/2016.
- Effective 05/2014, ING rebranded to Voya. The ING Investment Management (SA) has been updated to Voya Investment Management (SA) to reflect the change.

Miscellaneous Comments

- Fiscal year ends on 06/30.

**Montana Board of Investments
Fee Schedule**

As of September 30, 2019

	Fee Schedule	Market Value As of 09/30/2019 (\$)
SPDR S&P 500 ETF (SPY)	0.09 % of Assets	236,436
iShares:Core S&P Md-Cp (IJH)	0.07 % of Assets	28,100,859
iShares:Russ 2000 ETF (IWM)	0.19 % of Assets	77,486,837
iShares:MSCI EAFE ETF (EFA)	0.31 % of Assets	78,904,100
DFA Intl Sm Co;I (DFISX)	0.53 % of Assets	87,331,095
iShares:MSCI Em Mkts (EEM)	0.67 % of Assets	46,387,450
DFA Emg Mkts Sm Cap;I (DEMSX)	0.70 % of Assets	26,733,926

ETF fees are sourced from Morningstar and/or the investment manager. Mutual Fund fees are provided by staff.

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