

MONTANA

BOARD OF INVESTMENTS

OCTOBER 26 – 27, 2022

BOARD MEETING

MONTANA

BOARD OF INVESTMENTS

REGULAR BOARD MEETING
October 26 - 27, 2022

COMMITTEE MEETINGS

- A. Audit Committee – Maggie Peterson, Chair** **9:30 AM**
1. Public Comment – *Public Comment on issues with Committee Jurisdiction*
 2. Approval of August 3, 2022, Committee Minutes
 3. Executive Director Comments
 4. Audit Checklist
 5. Wipfli SOC Audit Draft Report – **Decision**
- B. Loan Committee – Jack Prothero, Chair** **10:00 AM**
1. Public Comment – *Public Comment on issues with Committee Jurisdiction*
 2. Approval of August 3, 2022, Committee Meeting Minutes
 3. Executive Director Comments
 4. INTERCAP Loan Request – **Decision**
 5. ARPA MOU with OBPP – **Decision**
- C. Human Resource Committee – Terry Cohea, Chair** **10:30 AM**
1. Public Comment – *Public Comment on issues with Committee Jurisdiction*
 2. Executive Director Comments
 3. Exempt Staff Leave Policy – **Decision**
 4. Recommendation to Hire Director of Private Investments – **Decision**
 5. Exempt Staff Performance Review – **Closed**

BREAK FOR LUNCH **12:00 PM**

- TAB 1 CALL TO ORDER – Karl Englund, Chairman** **1:00 PM**
- A. Notice of Video Recording of Meeting
 - B. Roll Call
 - C. Public Comment – *Public Comment on issues with Board Jurisdiction*
 - D. Approval of the August 3-4, 2022, Meeting Minutes, August 16, 2022, Special Meeting Minutes, and September 23 Special Meeting Minutes
 - E. Administrative Business
 1. Audit Committee Report – **Decision**
 2. Loan Committee Report – **Decisions**
 3. Human Resource Committee Report – **Decisions**
 - F. Comments from Pension Board Members
 - G. Comments from Board Legislative Liaisons

- TAB 2 EXECUTIVE DIRECTOR REPORTS – Dan Villa** **1:30 PM**
- A. Member Requests from Prior Meeting
 - B. Monthly Snapshot
 - C. 2023 Board Meeting Calendar – **Decision**

TAB 3 BENCHMARK REVIEW – CEM, Inc.	1:45 PM
BREAK	2:45 PM
TAB 4 ASSET ALLOCATION RANGE RECOMMENDATION – Jon Putnam	3:00 PM
ADJOURN	

October 27, 2022

RECONVENE AND CALL TO ORDER – Karl Englund, Chairman	9:30 AM
A. Roll Call	
B. Notice of Video Recording and Meeting	
C. Public Comment – <i>Public Comment on issues within Board Jurisdiction</i>	
TAB 5 INVESTMENTS – NEW COMMITMENTS	9:45 AM
A. Real Estate/Real Assets	
B. Private Investments	
TAB 6 SEPARATE ACCOUNTS INVESTMENT REVIEW – Fixed Income Team	10:15 AM
TAB 7 INVESTMENT POLICY STATEMENTS	11:15 AM
A. Montana Department of Agriculture Hail Insurance Fund – <i>Decision</i>	
RECAP OF STAFF TO DO LIST AND ADJOURNMENT – Karl Englund, Chairman	11:30 PM
APPENDIX	
A. Annual Board Meeting Schedule	
B. 2022/2023 Work Plan	
C. Terminology List	
D. Acronym Index	

MONTANA

BOARD OF INVESTMENTS

REGULAR BOARD MEETING MINUTES

August 3-4, 2022

Meeting recordings are posted at: <https://leg.mt.gov/lsc/>
(timestamps may differ)

CALL TO ORDER

The Board of Investment's meeting was called to order by Board Chairman Karl Englund at 11:15 a.m. on Wednesday, August 3, 2022.

ATTENDANCE

BOARD MEMBERS PRESENT: Karl Englund, Jack Prothero, Bruce Nelson, Diane Fladmo, Maggie Peterson, Mark Barry, Terry Cohea, Daniel Trost

BOARD MEMBER ABSENT: Jeff Meredith

LEGISLATIVE LIAISONS PRESENT: Rep. Ken Walsh

LEGISLATIVE LIAISONS ABSENT: Sen. Ryan Lynch

BOARD STAFF PRESENT: Brenda Thomas, Dan Villa, Dan Whyte, Dan Zarling, Doug Hill, Emily Kovarik, Eron Krpan, Ethan Hurley, Jason Brent, John Carpenter, John Romasko, Jon Putnam, Julie Feldman, Kelsey Gauthier, Kirsten Haswell, Lindsay Ford, Louise Welsh, Mark Lodman, Peggy MacEwen, Sam Holman, Savannah Morgan, Peggy Saarela, Sheli Jacoby, Steve Strong, Tammy Lindgren, Teri Kolnik, Ian Horwood

INTERESTED PARTIES PRESENT: Jim Voytko – RVK; Joepeth Ebisa – With Intelligence

August 3, 2022

TAB 1 CALL TO ORDER- KARL ENGLUND, BOARD CHAIRMAN (00:10)

A. Notice of Video Recording (00:18)

Chairman Englund advised of audio and video recording of the meeting.

B. Roll Call (00:27)

Roll was taken. Eight Board members were present, forming a quorum.

C. Public Comment (01:05)

Chairman Englund asked for public comment. None was given.

D. Approval of Minutes (02:03)

May 25-26, 2022, Regular Board Meeting

Member Prothero moved to approve. Member Peterson seconded the motion, which passed unanimously.

E. Administrative Business

1. Audit Committee Report (03:00)

Committee Chair Peterson briefed the Board.

2. Loan Committee Report (04:20)

Committee Chair Prothero briefed the Board.

3. HR Committee Report (05:23)

Committee Chair Cohea briefed the Board.

Member Peterson moved to approve the lateral transfer of Thomas Winkler to Investment Officer of Private Investments. Member Fladmo seconded the motion, which passed unanimously.

Committee Chair Cohea moved to approve a temporary exempt compensation adjustment for Thomas Winkler. Member Peterson seconded the motion, which passed unanimously.

F. Comments from Pension Board Members

Member Trost briefed the Board. (08:30)

Member Peterson briefed the Board. (09:20)

G. Comments from Board Legislative Liaisons (12:45)

Rep. Walsh briefed the Board.

TAB 2 EXECUTIVE DIRECTOR REPORTS (13:25)

A. Member Requests or Follow up from Prior Meeting

Executive Director Villa briefed the Board.

B. Monthly Snapshot

Executive Director Villa briefed the Board.

C. Budget Proposal for FY 24-25

Executive Director Villa briefed the Board.

Member Peterson moved to approve the budget proposal as submitted, the authority to add additional fees as they arise, and authorization to request one additional FTE. Member Trost seconded the motion, which passed unanimously.

D. Budget Status Prior FY

Executive Director Villa briefed the Board.

E. Board Policy Manual

The Board Policy manual adoption was deferred until the August 16, 2022, Special Board Meeting.

F. Coal Severance Tax Trust Fund Study Report

Executive Director Villa briefed the Board.

TAB 3 INVESTMENTS – NEW COMMITMENTS

A. Private Investments (33:22)

Ian Horwood briefed the Board.

B. Real Estate/Real Assets (51:06)

Ethan Hurley briefed the Board.

TAB 4 PROXY VOTING (1:12:10)

Jon Putnam briefed the Board.

TAB 5 RVK (1:42:03)

Jim Voytko briefed the Board.

TAB 6 INVESTMENT UPDATE

CIO Update (2:11:46)

Jon Putnam briefed the Board.

Macro Attribution (2:34:05)

Eron Krpan briefed the Board.

Private Equity (2:39:31)

Jon Putnam briefed the Board.

Real Estate and Real Assets (2:49:35)

Ethan Hurley briefed the Board.

Core Fixed Income (3:20:55)

John Romasko briefed the Board.

Non-Core Fixed Income, Domestic Equity, and International Equity (3:27:27)

Jason Brent briefed the Board.

STIP, State Fund and Trust Fund Investment Pool (3:37:02)

John Romasko briefed the Board.

August 4, 2022

CALL TO ORDER (00:06)

A. Notice of Video Recording (01:16)

Chairman Englund advised of audio and video recording of the meeting.

B. Roll Call (00:09)

Roll was taken. Six Board members were present including Chairman Karl Englund, Bruce Nelson, Diane Fladmo, Maggie Peterson, Mark Barry, and Terry Cohea, forming a quorum.

C. Public Comment (01:23)

Chairman Englund asked for public comment. None was given.

TAB 7 CORE FIXED INCOME ASSET CLASS REVIEW (01:35)

John Romasko, John Carpenter, Kelsey Gauthier, and Kirsten Haswell briefed the Board and answered questions.

TAB 8 MONTANA LOAN PROGRAM (2:00:47)

A. Commercial and Residential Portfolios Report

Doug Hill briefed the Board.

TAB 9 BOND PROGRAM (2:11:15)

A. INTERCAP

Louise Welsh briefed the Board.

RECAP OF STAFF TO DO LIST AND ADJOURNMENT (2:18:57)

Chairman Englund and Executive Director Villa listed items for follow-up.
Chairman Englund adjourned the meeting at 12:00 p.m.

MONTANA BOARD OF INVESTMENTS

APPROVE: _____
KARL J. ENGLUND, CHAIRMAN

ATTEST: _____
DAN VILLA, EXECUTIVE DIRECTOR

DATE: _____

MONTANA

BOARD OF INVESTMENTS

SPECIAL BOARD MEETING MINUTES

August 16, 2022

Meeting recordings are posted at: <https://leg.mt.gov/lspd/>
(timestamps may differ)

CALL TO ORDER

The Board of Investment's meeting was called to order by Chairman Karl Englund at 10:00 a.m. on Tuesday, August 16, 2022.

ATTENDANCE

BOARD MEMBERS PRESENT: Chairman Karl Englund, Bruce Nelson, Diane Fladmo, Maggie Peterson, Terry Cohea, Jack Prothero, Jeff Meredith, Mark Barry, Daniel Trost

BOARD MEMBER ABSENT: None

LEGISLATIVE LIAISONS PRESENT: None

BOARD STAFF PRESENT: Dan Villa, Dan Whyte, Lindsay Ford

INTERESTED PARTIES PRESENT: None

CALL TO ORDER – Karl Englund, Board Chairman

A. Notice of Video/Audio Recording (00:05)

Chairman Englund advised of audio and video recording of the meeting.

B. Roll Call (00:10)

Roll was taken: nine Board members were present, forming a quorum.

C. Public Comment – Public Comment on issues with Board Jurisdiction (00:50)

Chairman Englund asked for public comment. None was given.

D. Administrative Rule Hearing RE: MAR Notice No. 8-97-101 (01:06)

Board legal counsel Dan Whyte opened the hearing as the presiding officer and read the Notice of Function of the Administrative Rule Review committee as required.

Mr. Whyte opened the hearing for testimony, none was given.

ADJOURNMENT (15:20)

Chairman Englund adjourned the meeting at 10:15 a.m.

MONTANA BOARD OF INVESTMENTS

APPROVE: _____
KARL J. ENGLUND, CHAIRMAN

ATTEST: _____
DAN VILLA, EXECUTIVE DIRECTOR

DATE: _____

MONTANA

BOARD OF INVESTMENTS

SPECIAL BOARD MEETING MINUTES

September 23, 2022

Meeting recordings are posted at: <https://leg.mt.gov/lspd/>
(timestamps may differ)

CALL TO ORDER

The Board of Investment's meeting was called to order by Board Chairman Karl Englund at 10:02 a.m. on Friday, September 23, 2022.

ATTENDANCE

BOARD MEMBERS PRESENT: Karl Englund, Jack Prothero, Bruce Nelson, Diane Fladmo, Maggie Peterson, Mark Barry, Terry Cohea, Daniel Trost

BOARD MEMBERS ABSENT: Jeff Meredith

LEGISLATIVE LIAISONS PRESENT: None

LEGISLATIVE LIAISONS ABSENT: Sen. Ryan Lynch, Rep. Ken Walsh

BOARD STAFF PRESENT: Brenda Thomas, Dan Villa, Doug Hill, John Romasko, Jon Putnam, Julie Feldman, Kirsten Haswell, Peggy MacEwen, Peggy Saarela, Sam Holman, Savannah Morgan, Sheli Jacoby, Teri Kolnik, Tim House

INTERESTED PARTIES PRESENT: None

TAB 1 CALL TO ORDER – KARL ENGLUND, BOARD CHAIRMAN (00:00)

A. Notice of Video/Audio Recording (00:05)

Chairman Englund advised of audio and video recording of the meeting.

B. Roll Call (00:12)

Roll was taken: Eight Board members were present, forming a quorum.

C. Public Comment – Public Comment on issues with Board Jurisdiction (01:30)

Chairman Englund asked for public comment. None was given.

TAB 2 ADMINISTRATIVE RULE ADOPTION RE: MAR NOTICE NO. 8-97-101 (01:50)

Executive Director Villa briefed the Board. Once approved, the rules will be published October 7 to be effective October 8.

Member Mark Barry motioned to approve the rules as presented. Member Diane Fladmo seconded the motion, which passed unanimously.

TAB 3 BOARD POLICY MANUAL (02:46)

The Board reviewed the policies as presented. Chairman Englund had a few minor edits.

Member Maggie Peterson motioned to approve the Board Policies as presented with the edits suggested. Member Dan Trost seconded the motion, which passed unanimously.

TAB 4 MONTANA PROPERTIES SALES (09:55)

Director Villa briefed the Board on an opportunity to sell the small plot of land along California Street to the Montana Land Reliance. Chairman Englund noted one small correction that needed to be made to the buy-sell agreement.

Member Jack Prothero motioned to approve the buy/sell agreement as presented, including the small date correction. Member Diane Fladmo seconded the motion, which passed unanimously.

ADJOURNMENT (10:27)

Chairman Englund adjourned the meeting at 10:27 a.m.

MONTANA BOARD OF INVESTMENTS

APPROVE: _____
KARL J. ENGLUND, CHAIRMAN

ATTEST: _____
DAN VILLA, EXECUTIVE DIRECTOR

DATE: _____

MBOI Snapshot
Asset Management View
9/30/2022 Unaudited
Assets Under Management \$24,770,650,438



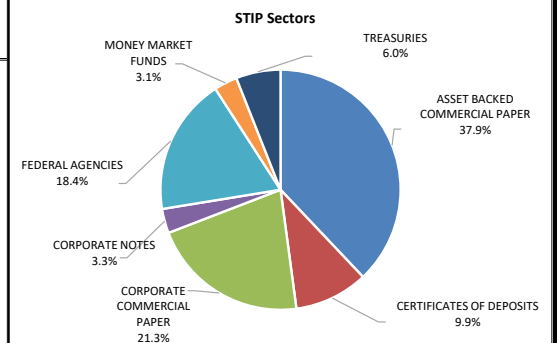
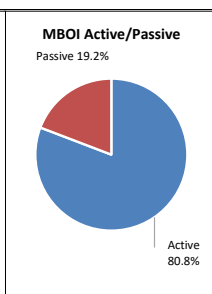
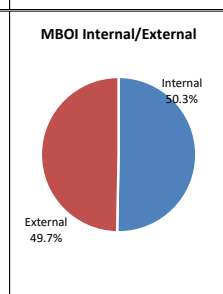
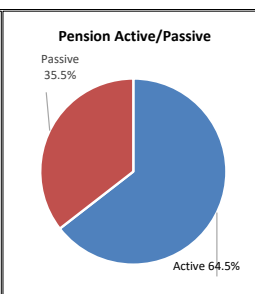
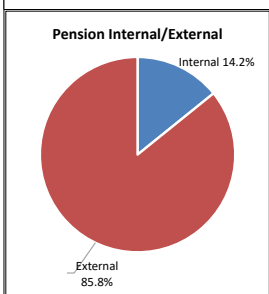
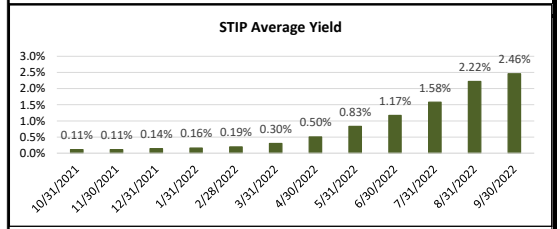
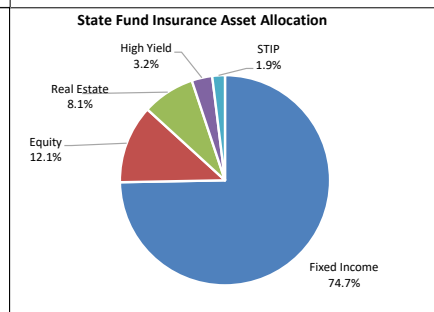
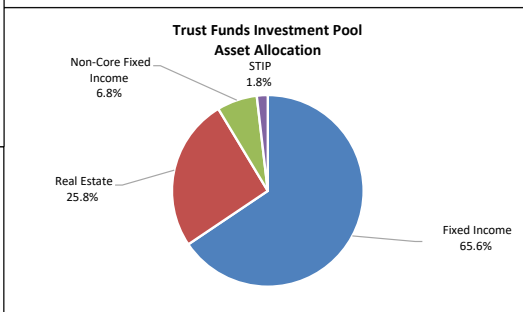
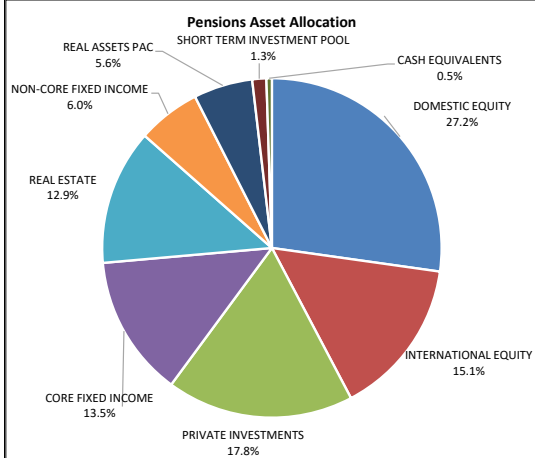
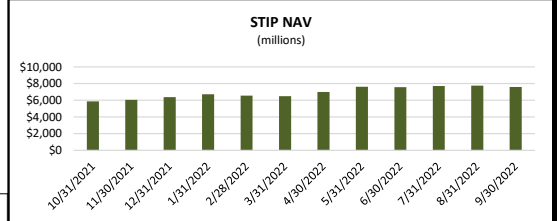
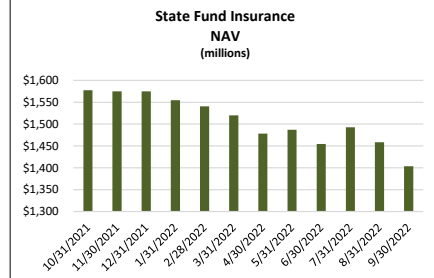
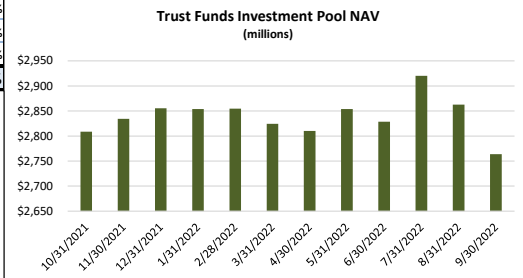
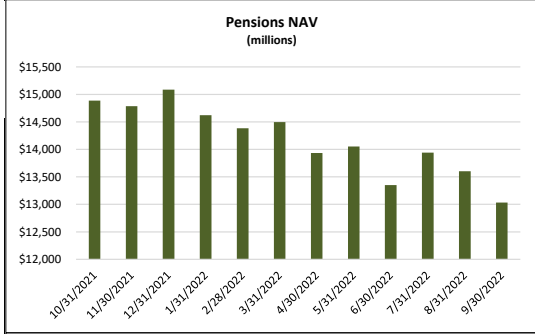
Pensions	NAV	%
DOMESTIC EQUITY	\$3,548,540,440	27.23%
INTERNATIONAL EQUITY	\$1,962,415,598	15.06%
PRIVATE INVESTMENTS	\$2,323,536,814	17.83%
CORE FIXED INCOME	\$1,757,699,195	13.49%
REAL ESTATE	\$1,682,833,417	12.91%
NON-CORE FIXED INCOME	\$783,381,100	6.01%
REAL ASSETS PAC	\$732,807,638	5.62%
SHORT TERM INVESTMENT POOL	\$174,674,676	1.34%
CASH EQUIVALENTS	\$67,748,386	0.52%
Pensions Total	\$13,033,637,263	100.00%

TFIP	NAV	%
Fixed Income	\$ 1,812,363,921	65.57%
Real Estate	\$ 712,689,652	25.79%
Non-Core Fixed Income	\$ 187,839,020	6.80%
STIP	\$ 50,912,278	1.84%
Total	\$ 2,763,804,871	100.00%

State Fund	NAV	%
Fixed Income	\$ 1,039,376,359	74.54%
Equity	\$ 169,454,647	12.15%
Real Estate	\$ 113,904,400	8.17%
High Yield	\$ 44,365,420	3.18%
STIP	\$ 27,362,182	1.96%
State Fund Total	\$ 1,394,463,008	100.00%

Other Fixed Income & Pending	\$	(15,228,274)
------------------------------	----	--------------

STIP*	NAV	%
ASSET BACKED COMMERCIAL PAPER	\$2,890,069,570	38.06%
FEDERAL AGENCIES	\$1,402,400,787	18.47%
CORPORATE COMMERCIAL PAPER	\$1,361,411,043	17.93%
CERTIFICATES OF DEPOSITS	\$901,365,972	11.87%
TREASURIES	\$555,004,157	7.31%
CORPORATE NOTES	\$249,370,103	3.28%
MONEY MARKET FUNDS	\$234,351,938	3.09%
STIP Total	\$7,593,973,571	100.00%



Definition of NAV: Net Asset Value is the total value of the account including assets held, adjusted for payables, receivables and liabilities

(1) Other Holdings column on page two represents the value of securities, receivables, payables and liabilities that comprise the Net Asset Value for the asset owner.

*Difference of \$124,037,089 is attributable the portion of STIP held within CAPP (\$66,740,798) and TFIP (\$50,764,480) as a cash investment and distributions held over month end (\$6,531,811). Such value is represented in the NAV for the CAPP and STIP columns.

MONTANA

BOARD OF INVESTMENTS

To: Members of the Board
From: Dan Villa, Executive Director
Date: October 26, 2022
Re: Executive Director Report

- A. Member Requests from Prior Meeting
- B. Monthly Snapshot – *attached*
- C. 2023 Board Meeting Calendar – *attached*

2023 Board of Investments Meetings - DRAFT

JANUARY						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

FEBRUARY						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

MARCH						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

APRIL						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

MAY						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

JUNE						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

JULY						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

AUGUST						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

SEPTEMBER						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

OCTOBER						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

NOVEMBER						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

DECEMBER						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

[Board Materials Due](#)
[Board Packet Mailing](#)
[Board Meeting Dates](#)

Investment
Benchmarking Analysis
(for the 5-year period ending December 31, 2021)

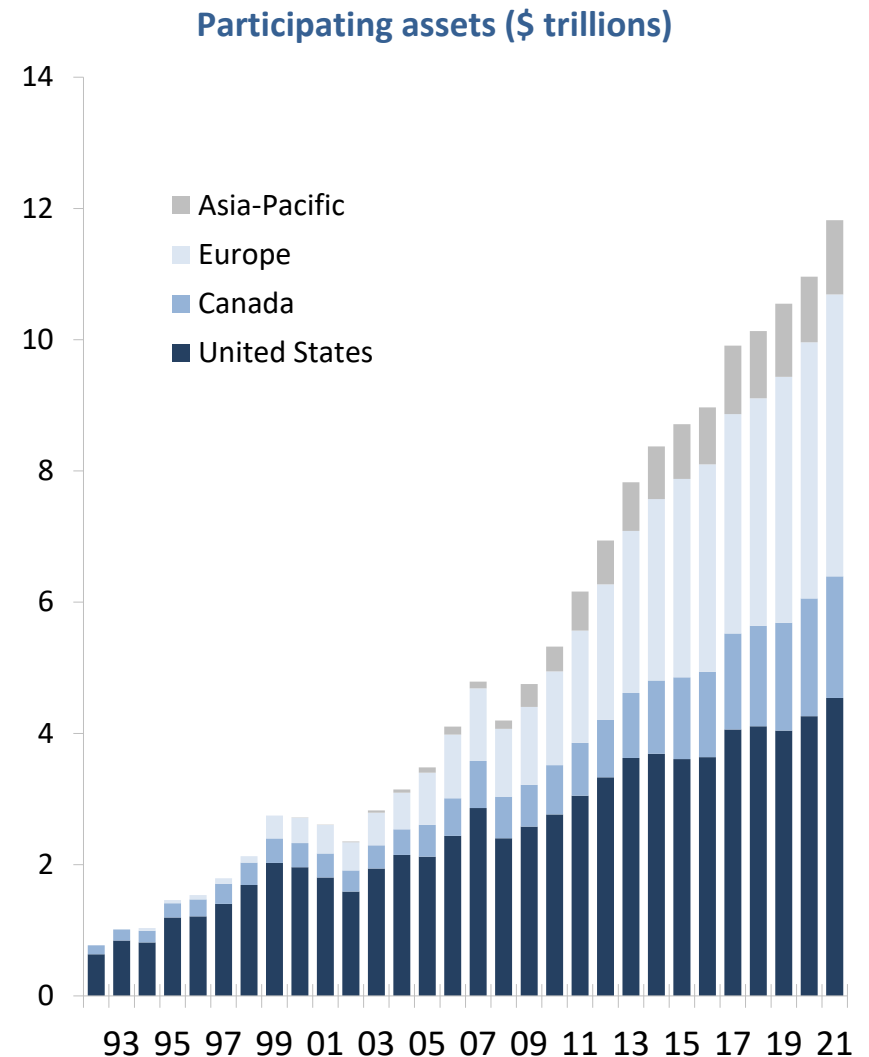
Montana Board of Investments



This benchmarking report compares your cost and return performance to the 271 funds in CEM's extensive pension database.

- 145 U.S. pension funds participate. The median U.S. fund had assets of \$13.2 billion and the average U.S. fund had assets of \$31.3 billion. Total participating U.S. assets were \$4.5 trillion.
- 66 Canadian funds participate with assets totaling \$1.9 trillion.
- 52 European funds participate with aggregate assets of \$4.3 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the U.K.
- 6 Asia-Pacific funds participate with aggregate assets of \$1.1 trillion. Included are funds from Australia, New Zealand, China and South Korea.
- 2 funds from other regions participate.

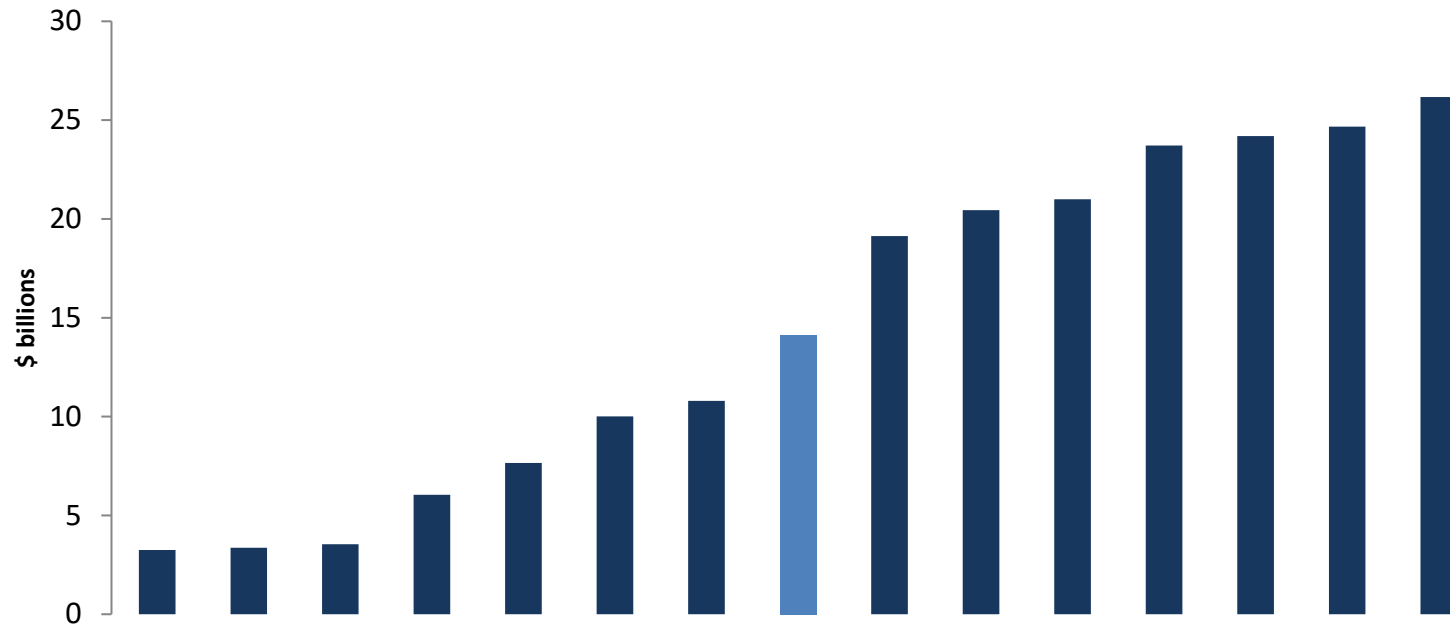
The most meaningful comparisons for your returns and implementation impacts are to the U.S. Public universe, which consists of 46 funds.



The most valuable comparisons for cost performance are to your custom peer group because size impacts costs.

Peer group for Montana Board of Investments

- 15 U.S. Public sponsors from \$3.2 billion to \$26.2 billion
- Median size of \$14.1 billion versus your \$14.1 billion



To preserve client confidentiality, given potential access to documents as permitted by the Freedom of Information Act, we do not disclose your peers' names in this document. For some of the peers, 2020 cost data was used as a proxy for 2021.

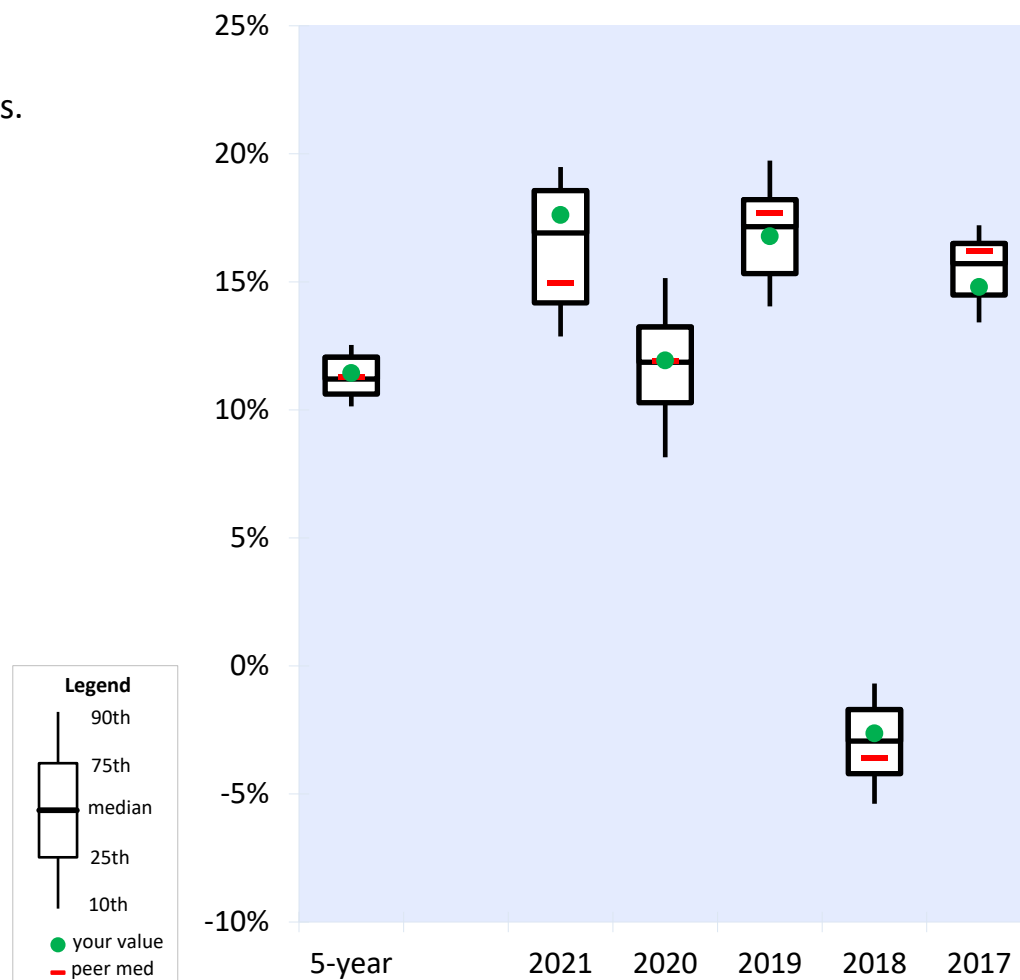
Your 5-year net total return of 11.4% was above both the U.S. Public median of 11.2% and the peer median of 11.3%.

Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and implementation impacts.

	Your 5-year
Net total fund return	11.4%
- Policy return	10.9%
= Implementation impacts	0.5%

This approach enables you to understand the contribution from both policy mix decisions (which tend to be the board's responsibility) and implementation decisions (which tend to be management's responsibility).

U.S. Public net total returns - quartile rankings



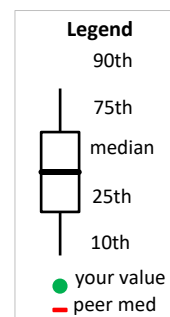
Your 5-year policy return of 10.9% was above both the U.S. Public median of 10.7% and the peer median of 10.8%.

Your policy return is the return you could have earned passively by indexing your investments according to your policy mix.

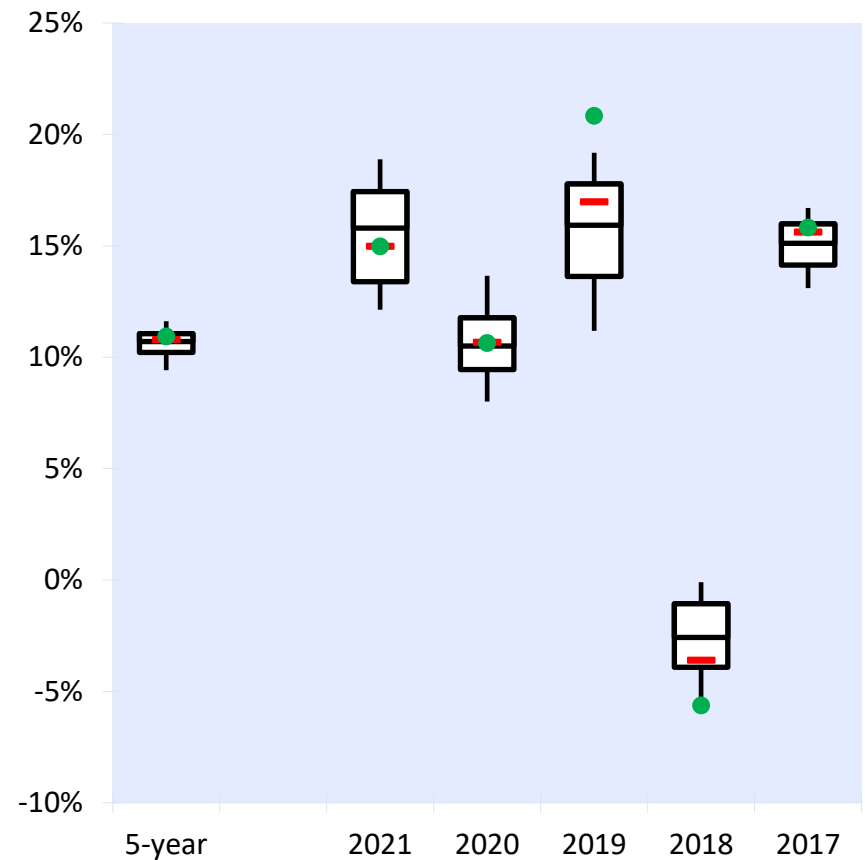
Having a higher or lower relative policy return is not necessarily good or bad. Your policy return reflects your investment policy, which should reflect your:

- Long term capital market expectations
- Liabilities
- Appetite for risk

Each of these three factors is different across funds. Therefore, it is not surprising that policy returns often vary widely between funds.



U.S. Public policy returns - quartile rankings



To enable fairer comparisons, the policy returns of all participants, including your fund, were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. Prior to this adjustment, your 5-year policy return was 11.1%, 0.2% higher than your adjusted 5-year policy return of 10.9%. Mirroring this, your 5-year total fund implementation impact would be 0.2% lower.

Your 5-year policy return of 10.9% was slightly above the U.S. Public median of 10.7% primarily because of:

- The positive impact of your higher weight and better benchmark return in one of the better performing asset classes of the past 5 years: U.S. Stock (your 32% 5-year average weight versus a U.S. Public average of 18%).
- The positive impact of your lower weight in one of the worse performing asset classes of the past 5 years: Hedge Funds (your 0% 5-year average weight versus a U.S. Public average of 3%).

1. 5-year weights are based only on plans with 5 years of continuous data.

2. Other fixed income includes: fixed income - long bonds and cash. Other real assets include: Commodities, Natural resources and Infrastructure.

3. A value of 'n/a' is shown if asset class returns are not available for the full 5 years or if they are broad and incomparable.

	5-year average policy mix ¹			5-year benchmark return	
	Your Fund	U.S. Publ Avg.	More/ Less	Your Fund	U.S. Publ Avg.
U.S. Stock	32%	18%	15%	18.2%	17.6%
EAFE/Global/Emerging	18%	30%	-12%	n/a ³	n/a ³
Total Stock	50%	47%	3%	15.1%	14.4%
U.S. Bonds	20%	17%	3%	3.6%	3.7%
Inflation Indexed Bonds	0%	3%	-3%	n/a ³	5.3%
High Yield Bonds	3%	2%	1%	6.3%	5.6%
Fixed income - Emerging	0%	1%	-1%	n/a ³	4.0%
Fixed income - Global	0%	1%	-1%	n/a ³	3.7%
Other Fixed Income ²	3%	2%	1%	n/a ³	n/a ³
Total Fixed Income	27%	27%	0%	3.7%	4.6%
Hedge funds	0%	3%	-3%	n/a ³	4.7%
Real estate incl. REITs	8%	9%	-1%	4.1%	7.5%
Other Real Assets ²	3%	3%	0%	n/a ³	n/a ³
Private equity	11%	9%	2%	12.3%	14.4%
Private debt	1%	2%	-1%	n/a ³	6.1%
Total	100%	100%			

Implementation impact is the difference between total net return and policy return. Your 5-year implementation impact of 0.5% compares to a peer median of 0.5% and a U.S. Public median of 0.7%.

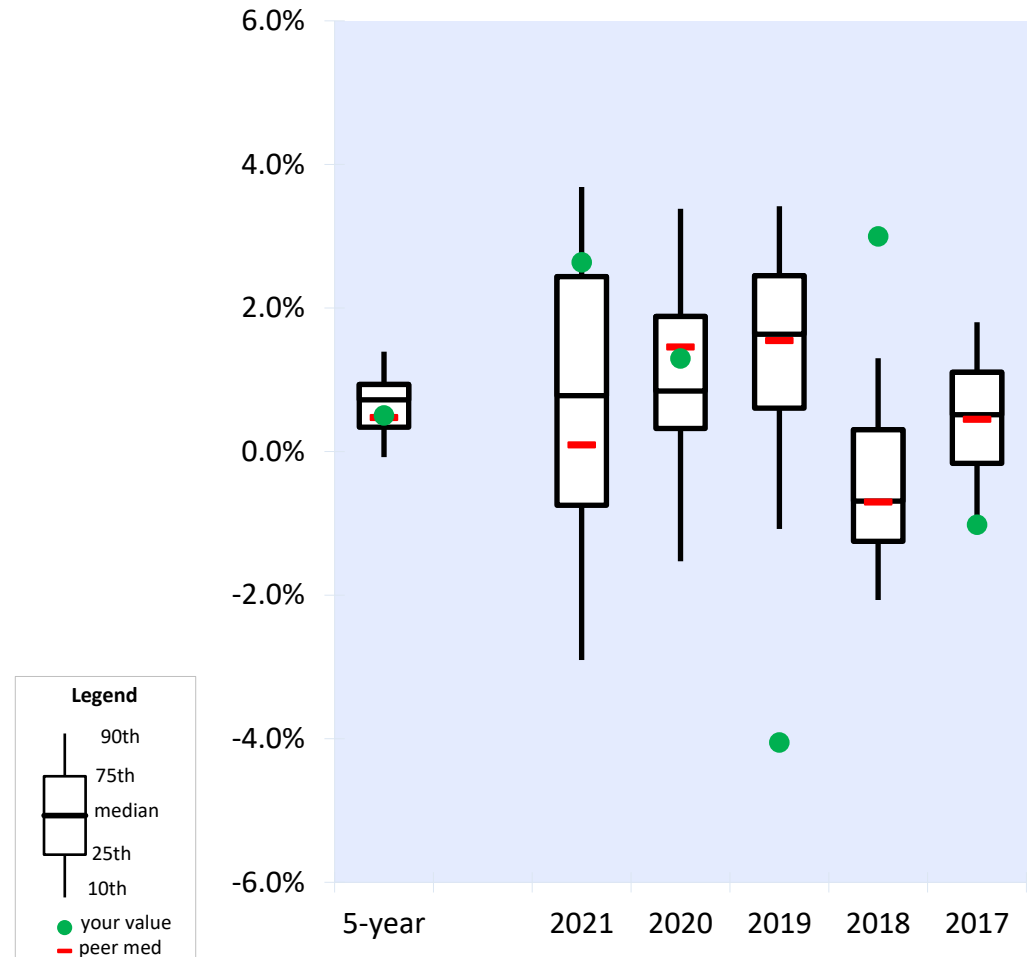
Implementation impact for Montana Board of Investments

Year	Net return	Policy return	Impl. impact
2021	17.6%	15.0%	2.6%
2020	11.9%	10.6%	1.3%
2019	16.8%	20.8%	-4.1%
2018	-2.6%	-5.6%	3.0%
2017	14.8%	15.8%	-1.0%
5-Year	11.4%	10.9%	0.5%

Implementation typically has a modest impact on total fund returns. Implementation impacts are mainly due to:

- Differences in asset class benchmarks across funds.
- Differences between actual holdings and policy weights for asset classes. These differences may be due to tactical asset allocation or rebalancing policies.
- Net return relative to benchmark returns within asset classes.

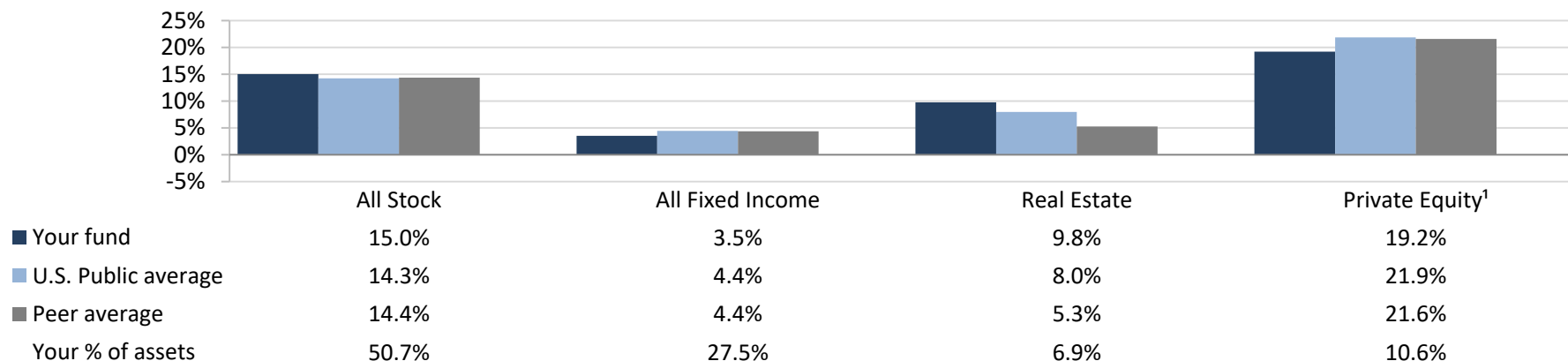
U.S. Public implementation impact - quartile



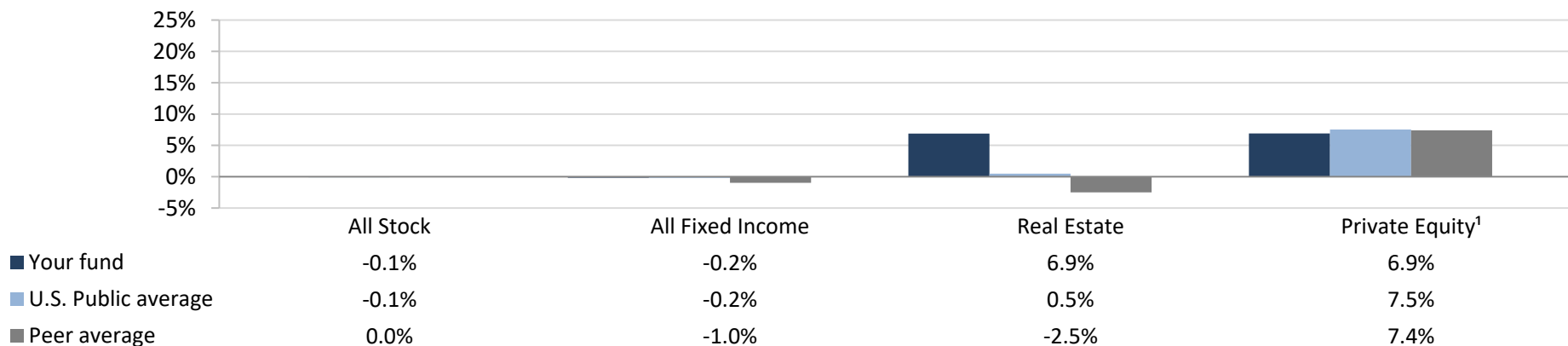
To enable fairer comparisons, the implementation impact for each participant including your fund was adjusted to reflect private equity benchmarks based on lagged, investable public market indices. Prior to this adjustment, your fund's 5-year total fund implementation impact was 0.3%.

Comparisons of your 5-year net return and implementation impacts by major asset class:

5-year average net return by major asset class



5-year average net return relative to benchmark² by major asset class



1. To enable fairer comparisons, the private equity benchmarks of all participants, including your fund were adjusted to reflect lagged, investable, public-market indices. Prior to this adjustment, your fund's 5-year private equity implementation impact added was 5.4%.

2. For the U.S. Public universe and your peers, the difference shown is the difference between their average net return and their average benchmark return.

Your investment costs, excluding private asset performance fees, were \$71.2 million or 50.4 basis points in 2021.

Asset management costs by asset class and style (\$000s)	Internal Mgmt		External Mgmt		Total	
	Active	Overseeing of external	Passive fees	Active base fees		
Stock - U.S. broad/all		755	385	6,756	7,896	
Stock - ACWI x U.S.		512	1,702	6,931	9,145	
Stock - Other		37		463	500	
Fixed income - U.S.	309	16		276	601	
Fixed income - Emerging		37		485	522	
Inflation Indexed Bonds	17				17	
High Yield Bonds		112		3,184	3,296	
Cash	61				61	
REITs		17		699	716	
Infrastructure - LP ²		24		2,900	2,925	
Natural resources - LP ²		206		4,553	4,760	
Other listed real assets ²		12		1,068	1,080	
Real estate ex-REITs ²		52		4,748	4,799	
Real estate ex-REITs - LP ²		275		8,844	9,119	
Private equity - Diversified - LP ²		461		14,550	15,011	
Private equity - Diversified - FoFs ^{1 2}		51		6,640	6,691	
Private credit - LP ²		128		716	844	
Total excluding private asset performance fees					67,983	48.1bp
Oversight, custodial and other costs ³						
Oversight of the fund					1,590	
Trustee & custodial					1,075	
Consulting and performance measurement					475	
Audit					28	
Other					0	
Total oversight, custodial & other costs					3,167	2.2bp
Total investment costs (excl. transaction costs & private asset performance)					71,150	50.4bp

Footnotes

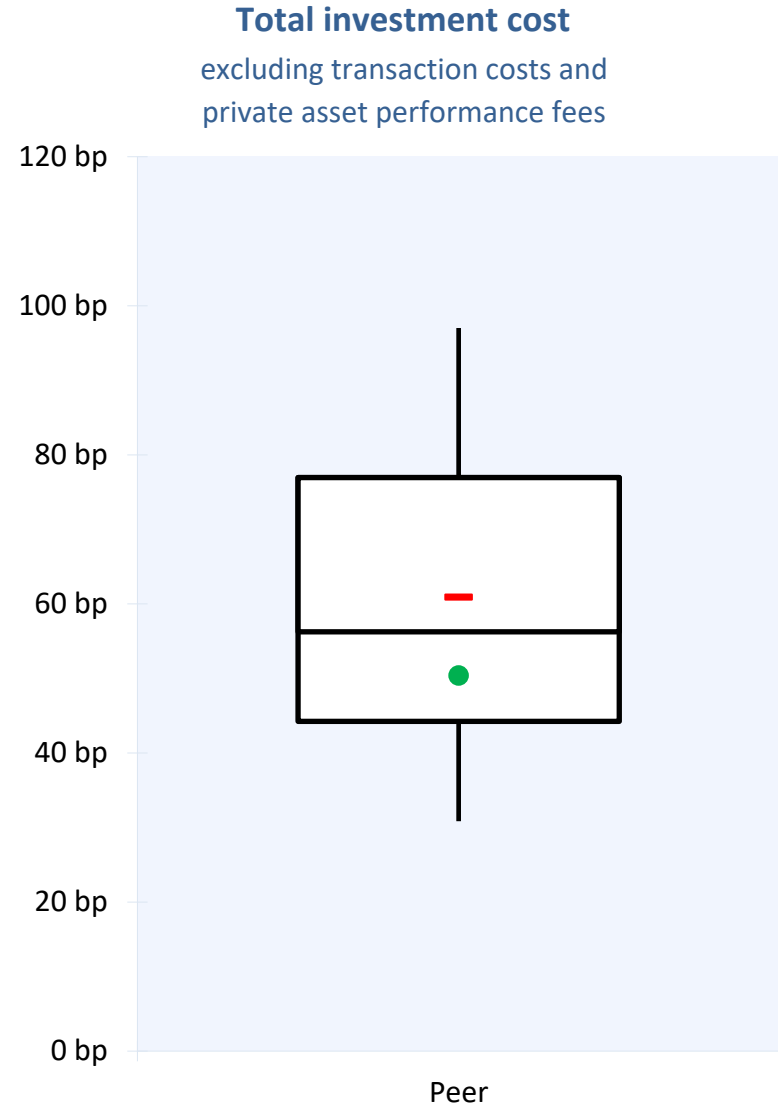
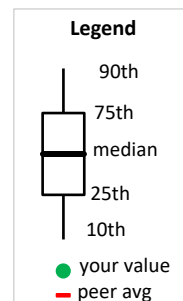
1. Default underlying costs were added: Private equity - Diversified - FoFs 154 bps. Refer to Appendix A for full details regarding defaults.
2. Total cost excludes carry/performance fees for real estate, infrastructure, natural resources and private equity. Performance fees are included for the public market asset classes and hedge funds.
3. Excludes non-investment costs, such as benefit insurance premiums and preparing cheques for retirees.

Your total investment cost of 50.4 bps was below the peer median of 56.3 bps.

Differences in total investment cost are often caused by two factors that are often outside of management's control:

- Asset mix, particularly holdings of the highest cost asset classes: real estate (excl. REITs), infrastructure, hedge funds, private equity and private credit. These high cost assets equaled 23% of your funds assets at the end of 2021 versus a peer average of 20%.
- Fund size. Bigger funds have advantages of scale.

Therefore, to assess whether your costs are high or low given your unique asset mix and size, CEM calculates a benchmark cost for your fund. This analysis is shown on the following page.



Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, your fund was slightly high cost by 3.9 basis points in 2021.

Your benchmark cost is an estimate of what your cost would be given your actual asset mix and the median costs that your peers pay for similar services. It represents the cost your peers would incur if they had your actual asset mix.

Your total cost of 50.4 bp was slightly above your benchmark cost of 46.4 bp. Thus, your excess cost was 3.9 bp.

Your cost versus benchmark

	\$000s	basis points
Your total investment cost	71,150	50.4 bp
Your benchmark cost	65,580	46.4 bp
Your excess cost	5,570	3.9 bp

Your fund was slightly high cost because it had a higher cost implementation style and it paid more than peers for some services.

Explanation of your cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Higher cost implementation style		
• More active management, less lower cost passive	4,230	3.0
• Less external management, more lower cost internal	(1,311)	(0.9)
• More LPs as a percentage of external	2,071	1.5
• Less fund of funds	(1,009)	(0.7)
• Less co-investment as a percentage of LP/Co	116	0.1
• Less overlays	(1,030)	(0.7)
	<u>3,067</u>	<u>2.2</u>
2. Paying more than peers for some services		
• External investment management costs	3,438	2.4
• Internal investment management costs	(225)	(0.2)
• Oversight, custodial & other costs	(710)	(0.5)
	<u>2,503</u>	<u>1.8</u>
Total excess cost	5,570	3.9

Differences in implementation styles cost you 2.2 bp relative to your peers.

Calculation of the cost impact of differences in implementation style

Asset class by implementation choice*	Assets by style (\$mils) ¹	Style %			Benchmark cost		More/ (less) ¹	Cost/ (savings) in \$000s	bps
		Your fund	Peer average	More/ (less)					
	A	B			C		A X B X C		
	Total assets	Passive % of total assets			Passive	Active	More/ (less)		
<u>Passive vs. Active</u>									
Stock - U.S. broad/all	4,415	65.1%	88.1%	(23.0%)	1.0 bp	48.3 bp	(47.2) bp	4,793	
Stock - ACWI x U.S.	2,536	51.1%	28.4%	22.8%	4.9 bp	41.6 bp	(36.7) bp	(2,121)	
Stock - Other	134	0.0%	68.1%	(68.1%)	1.0 bp	33.3 bp	(32.2) bp	295	
Fixed income - U.S.	2,108	0.0%	23.6%	(23.6%)	2.2 bp	10.0 bp	(7.8) bp	388	
Inflation Indexed Bonds	136	0.0%	79.8%	(79.8%)	1.9 bp	7.0 bp	(5.1) bp	56	
High Yield Bonds	729	0.0%	4.6%	(4.6%)	29.2 bp	35.3 bp	(6.1) bp	21	
REITs	185	0.0%	73.0%	(73.0%)	6.2 bp	38.7 bp	(32.4) bp	438	
Other listed real assets	135	0.0%	71.7%	(71.7%)	21.5 bp	58.8 bp	(37.3) bp	360	
Less passive								4,230	3.0 bp
	Active assets	Internal active % of active assets			Internal active	External active	More/ (less)		
<u>Internal active vs. external active</u>									
Fixed income - U.S.	2,108	92.8%	17.4%	75.5%	2.7 bp	11.6 bp	(8.9) bp	(1,412)	
Inflation Indexed Bonds	136	100.0%	11.4%	88.6%	1.8 bp	7.7 bp	(5.9) bp	(71)	
High Yield Bonds	729	0.0%	0.9%	(0.9%)	8.0 bp	35.5 bp	(27.5) bp	17	
Real estate ex-REITs	1,200	0.0%	1.8%	(1.8%)	32.7 bp	106.0 bp	(73.4) bp	155	
More int. active as % of total active								(1,311)	(0.9) bp
Total impact of differences in active vs. passive implementation styles								2,920	2.1 bp

* Implementation styles where you are exactly the same as your peers (i.e. style impact is zero) are not shown.

1. The 'style premium' is calculated as the difference between the style-weighted peer-median cost of the two styles being compared.

Differences in implementation style and their impacts are shown below.

Calculation of the cost impact of differences in implementation style

Asset class by implementation choice*	Assets by style (\$mils) ¹	Style %			Benchmark cost			Cost/ (savings) in \$000s	bps
		Your fund	Peer average	More/ (less)	More/ (less) ²				
	A	B			C		A X B X C		
<u>Evergreen vs. LP/Co/FoF</u>	External assets	Evergreen fund % of external			Ever-green	LP/Co/ FoF	More/ (less)		
Real estate ex-REITs	1,200	46.3%	50.5%	(4.2%)	78.0 bp	134.6 bp	(56.6) bp	285	
Infrastructure	125	0.0%	49.8%	(49.8%)	74.6 bp	129.5 bp	(54.9) bp	342	
Natural resources	468	0.0%	43.8%	(43.8%)	86.3 bp	133.6 bp	(47.4) bp	970	
Private credit	556	0.0%	19.3%	(19.3%)	87.6 bp	131.9 bp	(44.3) bp	474	
Less evergreen % of external								2,071	1.5 bp
<u>LP/Co vs. Fund of funds</u>	LP/Co/ FoF assets	LP and Co % of LP/Co/Fund of funds			LP/Co	FoF	More/ (less)		
Real estate ex-REITs	645	100.0%	98.4%	1.6%	134.0 bp	168.7 bp	(34.7) bp	(36)	
Private equity - Diversified	1,631	77.6%	68.7%	8.9%	160.7 bp	226.0 bp	(65.3) bp	(951)	
Private credit	556	100.0%	99.0%	1.0%	131.5 bp	169.0 bp	(37.5) bp	(22)	
More fund of funds % of LP/Co/FoF								(1,009)	(0.7) bp
<u>Co-investment vs. LP</u>	LP/Co assets	Co-investment % of limited partnerships			Co-invest.	Limited Partner.	More/ (less)		
Private equity - Diversified	1,266	0.0%	0.6%	(0.6%)	15.6 bp	161.6 bp	(146.0) bp	116	
Less co-investment % of LP/Co								116	0.1 bp
<u>Overlays</u>									
Impact of higher use of portfolio level overlays								(1,030)	(0.7) bp
Total impact of differences in implementation style on this page								148	0.1 bp

* Implementation styles where you are exactly the same as your peers (i.e. style impact is zero) are not shown.

1. 'Amount fees are based on' is the basis for calculating costs for private assets.

2. The 'style premium' is calculated as the difference between the style-weighted peer-median cost of the two styles being compared.

The net impact of paying more/less for external asset management costs added 2.4 bps.

Cost impact of paying more/(less) for external asset management

	Style	Your avg holdings ¹ in \$mils	Cost in bps			Cost/ (savings) \$000s (A X B)
			Your Fund	Peer median	More/ (less)	
External asset management		(A)			(B)	
Stock - U.S. broad/all	passive	2,874	1.6	1.0	0.6	170
Stock - U.S. broad/all	active	1,541	48.3	48.3	0.0	0
Stock - ACWI x U.S.	passive	1,297	13.5	4.9	8.6	1,116
Stock - ACWI x U.S.	active	1,239	59.7	41.6	18.1	2,236
Stock - Other	active	134	37.2	33.3	4.0	54
Fixed income - U.S.	active	151	19.4	11.6	7.8	118
Fixed income - Emerging	active	136	38.3	49.8	(11.5)	(157)
High Yield Bonds	active	729	45.2	35.5	9.7	706
REITs	active	185	38.7	38.7	0.0	0
Other listed real assets**	active	135	80.1	58.8	21.3	287
Real estate ex-REITs	active	555	86.4	78.0	8.4	469
Real estate ex-REITs*	LP	645	141.4	Excluded	--	--
Infrastructure*	LP	125	234.0	Excluded	--	--
Natural resources*	LP	468	101.8	Excluded	--	--
Private equity - Diversified*	LP	1,266	118.6	Excluded	--	--
Private equity - Diversified	FoF	365	29.3	72.0	(42.7)	(1,560)
Underlying base fees*	FoF	365	154.0	Excluded	--	--
Private credit*	LP	556	15.2	Excluded	--	--
Total impact of paying more/less for external management						3,438
Total in bps						2.4 bp

1. 'Amount fees are based on' is the basis for calculating costs for private assets.

*Your costs for these asset classes were provided net of management offsets/rebates. Other participants provide costs that are gross of these management offsets/rebates. Due to the different reporting basis, we do not compare the line item differences in the cost benchmarking analysis here and throughout the report.

**Database median used as peer and universe data was insufficient.

The net impact of paying more/less for internal asset management costs saved 0.2 bps.

Cost impact of paying more/(less) for internal asset management

	Style	Your avg holdings in \$mils	Cost in bps			Cost/ (savings) \$000s
			Your Fund	Peer median	More/ (less)	
Internal asset management		(A)			(B)	(A X B)
Fixed income - U.S.*	active	1,957	1.6	2.7	(1.1)	(218)
Inflation Indexed Bonds**	active	136	1.3	1.8	(0.5)	(7)
Cash	active	377	1.6	Excluded	--	--
Total for internal management						(225)
Total in bps						(0.2) bp

'Excluded' indicates that the asset class was excluded from this analysis due to comparability concerns with peers.

*Universe median used as peer data was insufficient.

**Database median used as peer and universe data was insufficient.

The net impact of differences in oversight, custodial & other costs saved 0.5 bps.

Cost impact of differences in oversight, custodial & other costs

	Your avg holdings in \$mils (A)	Cost in bps			Cost/ (savings) \$000s (A X B)
		Your Fund	Peer median	More/ (less) (B)	
Oversight	14,119	1.1	1.4	(0.2)	
Consulting	14,119	0.3	0.6	(0.3)	
Custodial	14,119	0.8	0.5	0.3	
Audit	14,119	0.0	0.1	(0.1)	
Other	14,119	0.0	0.2	(0.2)	
Total for oversight, custodial, other ¹		2.2	2.7	(0.5)	-710
Total in bps					(0.5) bp

1. Oversight, custodial, and other costs are benchmarked using the peer median cost for the total of the pieces. the individual line items are shown for comparison but not used in the benchmark.

The table below summarizes why your fund is high/low cost relative to the peer-median by asset class.

Why are you high/(low) cost by asset class?

Asset class/category	Impl. style \$000s	Paying more/(less) \$000s	Total \$000s	Total bps	2021	
					Holding %	Impl. impact
Stock - U.S. broad/all	4,793	170	4,963	11.2 bp	31%	117.9 bp
Stock - ACWI x U.S.	(2,121)	3,352	1,231	4.9 bp	18%	(68.6) bp
Stock - Other	295	54	348	25.9 bp	1%	98.0 bp
Fixed income - U.S.	(1,024)	(100)	(1,124)	(5.3) bp	15%	3.9 bp
Fixed income - Emerging	0	(157)	(157)	(11.5) bp	1%	43.0 bp
Inflation Indexed Bonds	(15)	(7)	(22)	(1.6) bp	1%	58.4 bp
High Yield Bonds	38	706	744	10.2 bp	5%	60.0 bp
REITs	438	0	438	23.7 bp	1%	(545.4) bp
Other listed real assets	360	287	648	48.0 bp	1%	370.0 bp
Real estate ex-REITs	404	469	873	7.3 bp	7%	1043.9 bp
Infrastructure	342	0	342	27.3 bp	0%	--
Natural resources	970	0	970	20.7 bp	2%	(426.0) bp
Private equity - Diversified	(836)	(1,560)	(2,396)	(14.7) bp	11%	1143.4 bp
Private credit	452	0	452	8.1 bp	3%	1302.7 bp
Derivatives and overlays	(1,030)	0	(1,030)	(0.7) bp	0%	--
Oversight, custodial & other	n/a	(710)	(710)	(0.5) bp	--	--
Total	3,067	2,503	5,570	3.9 bp	100%	263.6 bp

Key Takeaways

Returns

- Your 5-year net total return was 11.4%. This was above both the U.S. Public median of 11.2% and the peer median of 11.3%.
- Your 5-year policy return was 10.9%. This was above both the U.S. Public median of 10.7% and the peer median of 10.8%.

Implementation impact

- Your 5-year implementation impact was 0.5%. This was slightly below the U.S. Public median of 0.7% and equal to the peer median of 0.5%.

Cost and cost effectiveness

- Your investment cost of 50.4 bps was above your benchmark cost of 46.4 bps. This suggests that your fund was slightly high cost compared to your peers.
- Your fund was slightly high cost because it had a higher cost implementation style and it paid more than peers for some services.
- Despite being 3.9 bps above benchmark cost, you delivered 263.6 bps of implementation impact in 2021.

Asset Allocation

Jon Putnam – Chief Investment Officer

Date: October 26, 2022

Key Considerations

- Asset Allocation is critical to the long-term success of the portfolios managed by BOI. Annual approval of the asset allocation is an essential task of the Board.
- Diversification of the portfolio protects against extreme outcomes.
- There is no asset allocation that is “right” for every plan. The expected return and potential risk changes over time.
- The recommended asset allocation should consider the funding objectives, the characteristics of the plan/account, and the opportunity set of investments.
- Actual results measured over shorter time frames will deviate from the long-term assumptions. This does not mean the long-term assumptions are wrong.

Asset Allocation Process

- Determine if there have been any changes in client objectives and constraints.
- Evaluate any long-term shifts in the global economic environment.
 - Review Capital Market Assumptions produced by RVK and other market participants.
- All senior investment staff submit proposed asset allocations.
- RVK calculates multiple scenarios using the Mean Variance Optimization (MVO) model.
 - Process of weighing risk versus return to determine the most efficient portfolio.
 - Limitations of MVO include:
 - Sensitive to changes in expected return, variance, and correlation of assets
 - Constraints must be applied to avoid concentrated portfolios
 - Assumes an efficient market with rational participants
- Qualitative judgment must be applied to the process.
- Asset allocation meeting in Portland with RVK to discuss views.

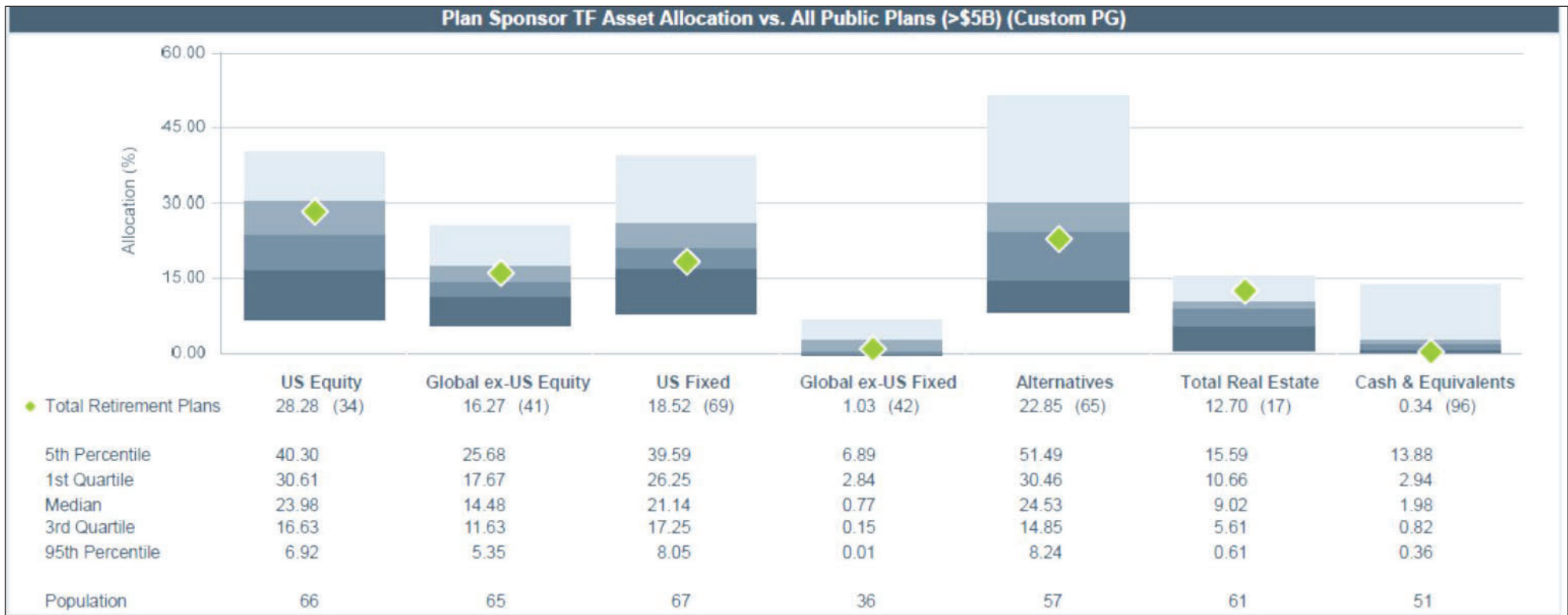
Net Cash Need

- Consideration of liquidity needs is a critical component of asset allocation. Avoid being a forced seller.

Public Employees' Retirement System (PERS)					
<i>Year End</i>	<i>Market Value of Assets (MVA)</i>	<i>Contributions</i>	<i>Benefit Payments</i>	<i>Net Cash Flow</i>	<i>Net Cash Flow as a Percent of MVA</i>
6/30/2015	\$5,061,058	\$230,067	\$336,885	-\$106,818	-2.11%
6/30/2016	\$5,032,807	\$230,471	\$359,842	-\$129,371	-2.57%
6/30/2017	\$5,472,519	\$233,063	\$384,700	-\$151,637	-2.77%
6/30/2018	\$5,779,994	\$243,385	\$415,158	-\$171,773	-2.97%
6/30/2019	\$5,903,306	\$243,613	\$441,225	-\$197,612	-3.35%
6/30/2020	\$5,845,474	\$252,009	\$468,018	-\$216,009	-3.70%
6/30/2021	\$7,210,027	\$267,771	\$496,392	-\$228,621	-3.17%
6/30/2022	\$6,648,899	\$266,891	\$532,117	-\$265,226	-3.99%
* PERS 2022 Actuarial Valuation Study					
Teachers' Retirement System (TRS)					
<i>Year End</i>	<i>Market Value of Assets (MVA)</i>	<i>Contributions</i>	<i>Benefit Payments</i>	<i>Net Cash Flow</i>	<i>Net Cash Flow as a Percent of MVA</i>
6/30/2015	\$3,708,386	\$202,896	\$311,079	-\$108,183	-2.92%
6/30/2016	\$3,656,831	\$205,287	\$328,216	-\$122,929	-3.36%
6/30/2017	\$3,950,705	\$210,521	\$343,449	-\$132,928	-3.36%
6/30/2018	\$4,148,324	\$214,833	\$361,026	-\$146,193	-3.52%
6/30/2019	\$4,220,286	\$220,949	\$376,738	-\$155,789	-3.69%
6/30/2020	\$4,167,840	\$228,563	\$393,336	-\$164,773	-3.95%
6/30/2021	\$5,116,849	\$231,360	\$412,724	-\$181,364	-3.54%
6/30/2022	\$4,724,449	\$243,409	\$428,240	-\$184,831	-3.91%
* TRS 2022 Actuarial Valuation Study					

Comparison to Peers

- BOI's biggest difference to peers:
 - Overweight Public Equities
 - Underweight U.S. Fixed Income
 - No Hedge Fund Exposure
 - Overweight Real Estate



Source: RVK Quarterly Investment Performance Analysis 06/30/22

Summary

- Review and approval of the asset allocation is a critical task for the Board.
- Selection of an asset allocation is an imperfect process but is a valuable exercise.
- Consideration of liquidity is important to meet participant needs and avoid forced selling.
- Staff constantly evaluates and adjusts portfolios within the approved asset allocation ranges.

MONTANA

BOARD OF INVESTMENTS

TO: Members of the Board
FROM: Jon Putnam, Chief Investment Officer
DATE: October 26, 2022
RE: Proposed Asset Allocation – November Vote

After discussion with staff and RVK, I am proposing changes to the asset allocation for CAPP as shown in the table below. The redline of the proposed Montana Public Retirement Plans, Policy Number 40.201 follows this memo.

Asset Class	Current Range	Proposed Range	Current Midpoint	Proposed Midpoint	Midpoint Difference
Domestic Equity	24 - 36%	23 - 35%	30%	29%	-1
International Equity	12 - 22%	10 - 20%	17%	15%	-2
Private Investments	11 - 19%	12 - 20%	15%	16%	+1
Real Assets	2 - 8%	3 - 9%	5%	6%	+1
Real Estate	6 - 14%	7 - 15%	10%	11%	+1
Core Fixed Income	9 - 19%	9 - 19%	14%	14%	0
Non-Core Fixed Income	5 - 9%	5 - 9%	7%	7%	0
Cash Equivalents *	0 - 5%	0 - 5%	2% *	2% *	0

* Target of 2% for Cash Equivalents is lower than the midpoint of the proposed range

Asset Allocation Changes

The rationale for each of the asset allocation changes are discussed below:

A. Increase the midpoint of Private Investments from 15% to 16%.

The expected return for Private Investments is higher than all other asset classes based on the 2022 Long-Term Capital Market Assumptions for RVK and other industry sources.

BOI has demonstrated an ability to successfully invest in private markets with excellent long-term returns.

B. Reduce the midpoint of Domestic Equity from 30% to 29%.

Staff recommends reducing our public equity exposure in favor of private equity exposure. The number of public companies have been shrinking as firms decide to remain private for longer. 87% of companies with greater than \$100M in revenue are private.

C. Increase the midpoint of Real Assets from 5% to 6% and increase the midpoint of Real Estate from 10% to 11%.

Both Real Assets and Real Estate offer attractive total returns with steady cash flows to pay benefits. They are also strong diversifiers to the equity exposure in the portfolio.

D. Reduce the midpoint of International Equity from 17% to 15%.

Staff believes significant uncertainty exists in International Equities including geopolitical conflict and the intensification of trade disputes.

Despite low valuations, risks are elevated across geographies and staff remains cautious.

Questions

A. When would these changes take effect?

The board will vote on the proposal at the November board meeting.

If the board approves the proposal at the November meeting, the asset allocation changes would take effect at that time.

B. Are there any proposed changes to other BOI portfolios?

There are no changes proposed to the asset allocation for Trust Funds Investment Pool (TFIP) or State Fund Investment Pool (SFIP) at this time.

MONTANA

BOARD OF INVESTMENTS

BOARD ADOPTED POLICY

POLICY NUMBER: 40.201
~~2021~~December 6, 2022

EFFECTIVE DATE: ~~November 30,~~

TITLE: Montana Public Retirement Plans
~~2020~~November 30, 2021
 Asset Allocation Ranges

SUPERSEDES: ~~November 19,~~

BOARD ADOPTION: ~~November 30, 2021~~December 6, 2022

REVIEWED:

I. Appendix I: Montana Public Retirement Plans Asset Allocation Ranges

A. Permitted Ranges:

1. Approved ~~November 30, 2021~~December 6, 2022.

Asset Class Allocations		
Asset Class	Range Low	Range High
Domestic Equities	24 <u>23</u>	36 <u>35</u>
International Equities	12 <u>10</u>	22 <u>20</u>
Private Investments	11 <u>12</u>	19 <u>20</u>
Real Assets	23	89
Real Estate	67	1415
Core Fixed Income	9	19
Non-Core Fixed Income	5	9
Cash ¹	0	5
Total		
<p>¹ The combined cash at the plan level and the CAPP level is subject to the range.</p> <p>² Montana Public Retirement Plans shall have no greater than 5% of the Net Asset Value managed by any one external manager using an active investment strategy.</p>		

SEPARATE ACCOUNTS REVIEW

Presented by:

John Romasko, CFA, Kirsten Haswell,
John Carpenter, CPA, and Kelsey Gauthier, CPA

Date: October 27, 2022

Table of Contents

Separate Account Clients

- Client Types
- Policy & Portfolio Construction
- Types of Investments
- Trust Fund Investment Pool (TFIP)
- Short Term Investment Pool (STIP)
- State Fund Investment Pool (SFIP)
- Client Interaction and Portfolio Construction Examples

Separate Account Clients

Assets Under Management 09/30/2022

Name	AUM Millions	Name	AUM Millions
Trust Funds - Permanent			
Coal Severance Tax Trust Fund	\$ 1,152.1	Smelter Hill Uplands Restoration Fund	\$ 8.8
Coal Tax Park Trust Fund	\$ 29.5	Streamside Tailings Operable Settlement	\$ 16.7
Cultural Trust Fund	\$ 15.8	Upper Clark Fork River Basin Reserve Fund	\$ 21.1
Endowment For Children	\$ 1.4	Upper Clark Fork River Basin Rest Fund	\$ 69.4
FWP Mitigation Trust Fund	\$ 10.6	Upper Blackfoot Resp Action and Rest Fund	\$ 1.2
Harold Hamm Endowment	\$ 0.05	Zortman/Landusky Long Term Water Trust	\$ 20.5
Historical Society Trust Funds	\$ 4.0	Zortman/Landusky Long Term Water	\$ 15.7
Noxious Weed Management Trust Fund	\$ 10.4	Barker Hughesville St Response Fund	\$ 8.8
Older Montanans Trust Fund	\$ 0.3	Flying J CECRA Facilities Fund	\$ 2.6
Potter Trust Fund	\$ 0.2	Libby Asbestos Site State Cost Fund	\$ 4.8
Public School Trust	\$ 821.2	Luttrell Pit Oper & Maint Fund	\$ 2.2
Real Property Trust Fund	\$ 7.1	E Helena Greenway Trail Maint Fund	\$ 1.0
Resource Indemnity Trust Fund	\$ 107.0	Yellowstone Pipeline Creanup Fund	\$ 6.4
Tobacco Trust Fund	\$ 285.8	Insurance Funds	
Wildlife Habitat Trust Fund	\$ 15.4	State Employee Group Benefits	\$ 126.1
Invasive Species Trust Fund	3.2	MUS Group Insurance	\$ 90.3
Trust Funds - Expendable		MUS Workers Compensation	\$ 15.5
Abandoned Mine Land Reclamation Trust	\$ 6.7	Subsequent Injury Fund	\$ 1.1
Belt Water Treatment Plant Fund	\$ 26.1	Montana State Fund	\$ 1,403.7
Butte Area One Restoration Fund	\$ 6.4	Operating Funds	
Butte Area Redevelopment Trust	\$ 13.5	FWP General License Account	\$ 79.9
Clark Fork Restoration Fund	\$ 27.4	Montana State University - Bozeman	\$ 310.3
Clark Fork Site Response Action Fund	\$ 57.5	Montana Tech	\$ 8.4
East Helena Compensation Fund	\$ 3.9	State Treasurer's Fund	\$ 3,657.6
Montana Pole Superfund Site Settlement	\$ 20.6	University Of Montana - Missoula	\$ 115.0

Separate Account Clients

Policy and Portfolio Construction

- Develop portfolio objectives and constraints in consultation with clients and investment staff
- Choose an appropriate benchmark and define the investment guidelines
- Construct portfolio based on guidelines
 - Duration based on interest rate and economic outlook versus market
 - Relative value between sectors / securities
- Monitor portfolio
 - Regular review of portfolio characteristics relative to the benchmark
 - Continual evaluation of current securities and potential opportunities
 - Regular meetings to discuss news, market events, portfolio structure, relative value, and market conditions

Separate Account Clients

Types of Investments and Why We Use Them

- Short Term Investment Pool (STIP)
 - Similar to a short-term money market fund
 - Provides liquidity
 - Modest increase in yield
 - Default fund to all investments not otherwise allocated
- Trust Funds Investment Pool (TFIP)
 - Diversify investments
 - Increase yield
 - Enhance Total Return
- Individual Securities
 - Special circumstances

Separate Account Clients

Trust Funds Investment Pool Objectives

- Strategic Objective
 - Provide a diversified investment vehicle for participants that offers a return that assists in supporting client missions
- Investment Objectives
 - Provide investment income by assuming a prudent amount of risk
 - Preserve principal by diversifying the portfolio across risk factors

Separate Account Clients

TFIP Participant Distributions

- Cash distributed is an important factor to Separate Accounts
- Distributions have been pressured downward with the secular decline in interest rates over the last 30+ years
- Based on current market rates, distribution yields have started to increase



Separate Account Clients

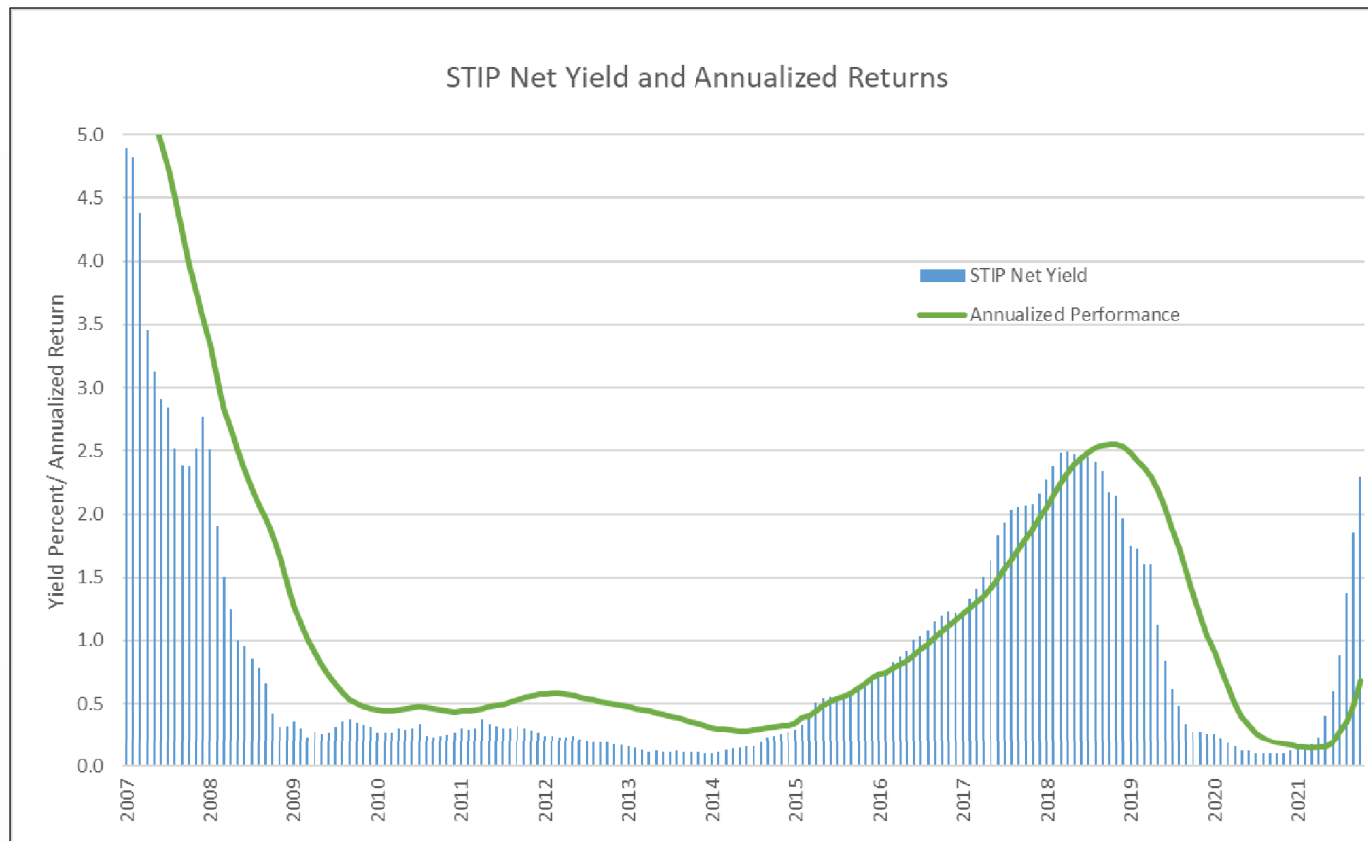
Short Term Investment Pool Objectives

- STIP has three clearly defined objectives in order of importance:
 - Preservation of principal
 - Liquidity
 - Return

Separate Account Clients

Short Term Investment Pool Net Yield

- STIP yield has seen a sharp increase as the Federal Reserve increases interest rates to offset Inflation
- Based on current market expectations, STIP yield will continue to increase



Separate Account Clients

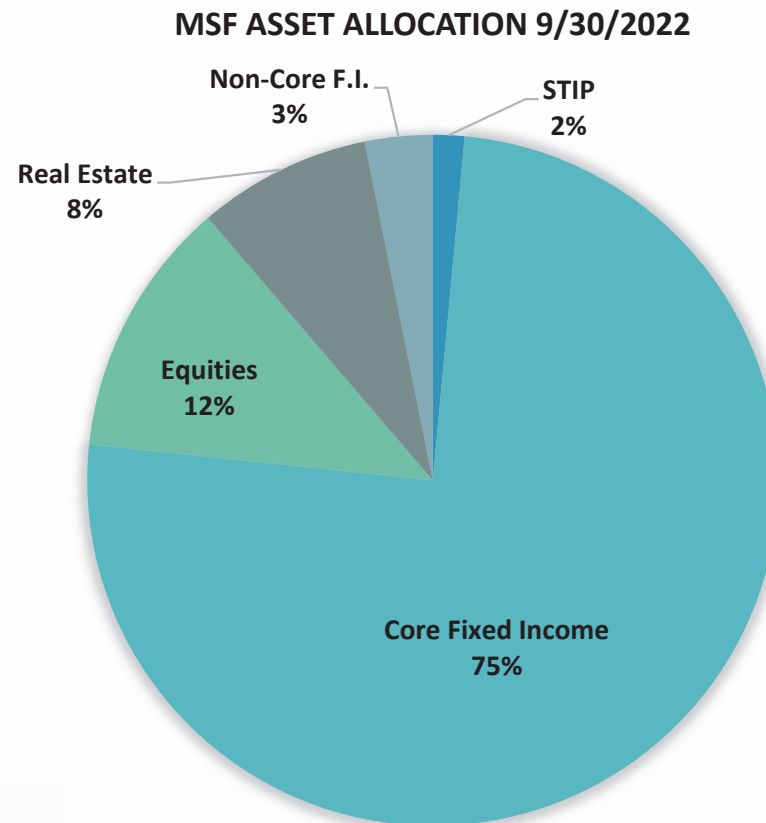
State Fund Investment Portfolio Objectives

- Strategic Objective
 - Attain returns that assist MSF in meeting liabilities as well as maintaining stable, cost-effective rates for workers' compensation insurance
- Primary Investment Objectives
 - Provide investment income by assuming a prudent amount of risk
 - Preserve principal by diversifying the portfolio across risk factors
- Secondary Investment Objectives
 - Long-term capital appreciation in excess of inflation

Separate Account Clients

State Fund Investment Portfolio Characteristics 09/30/2022

- Total market value: \$1.40B



Separate Account Clients

Client Interaction and Portfolio Development

- All team members participate in portfolio management
- All team members have primary and back up responsibilities
- Group Benefits Funds – John Carpenter
- Pipeline Spills Funds – Kelsey Gauthier
- Hail Insurance Fund – Kirsten Haswell
- Butte Superfund Advisory Trust Account – John Romasko

MONTANA

BOARD OF INVESTMENTS

TO: Members of the Board

FROM: John Romasko, Director of Fixed Income
Kirsten Haswell, Investment Officer

DATE: October 27, 2022

RE: Department of Agriculture - Hail Insurance Fund

Proposed Investment Policy Statement:

The Hail Insurance Fund account consists of funds from producers' premiums paid into the account, along with moneys received from Federal stimulus funds. The Montana State Hail Insurance Program was created at the request of producers in 1917 to provide basic hail insurance coverage on any crop grown in Montana.

The goal of the new Fund is to reduce the cost of insurance premium through a reduction in reinsurance costs. A portion of the portfolio is unlikely to be needed for liquidity purposes and may seek higher returns as deemed appropriate, but in anticipation of a year with high claims, liquidity is also necessary.

The Investment Policy Statement will guide staff to manage the balance between investment income and preservation of principal.

MONTANA

BOARD OF INVESTMENTS

BOARD ADOPTED POLICY

POLICY NUMBER: 40.947

EFFECTIVE DATE: Upon Board Approval

TITLE: Investment Objectives and Guidelines
Hail Insurance Fund

SUPERSEDES: New

BOARD ADOPTION: TBD

REVIEWED:

I. Appendix III: Operating Funds: Investment Objectives and Guidelines

- A. Schedule III-C: Investment Objectives and Guidelines Hail Insurance Fund.
- B. Approved Date of Schedule:
- C. This Schedule is effective upon adoption by the Board and supersedes all previous Investment Objectives and Guidelines for this specific portfolio.

II. Introduction

- A. The purpose of this policy statement is to provide a framework for the Hail Insurance Fund investments under the guidance of the Board.
- B. The Hail Insurance Fund account consists of funds from producers' premiums paid into the account, along with moneys received from Federal stimulus funds. The Montana State Hail Insurance Program was created at the request of producers in 1917 to provide basic hail insurance coverage on any crop grown in Montana. The goal of the new fund is to reduce the cost of insurance premium through a reduction in reinsurance costs. A portion of the portfolio is unlikely to be needed for liquidity purposes and may seek higher returns as deemed appropriate, but in anticipation of a year with high claims, liquidity is also necessary.

III. Statement of Purpose

- A. The purpose of these objectives and guidelines is to:
 - 1. Establish the investment objectives and performance standards of the Hail Insurance Fund account.
 - 2. Provide diversified investment exposure within the guidelines in a prudent and cost-effective manner.

IV. Investment Objective

- A. Strategic
 - 1. The objective of the Hail Insurance Fund portfolio is to attain above benchmark total return within the parameters of the Investment Guidelines set forth below with an emphasis on investment income and preservation of principal.
- B. Performance
 - 1. Success in achieving this objective will be measured by comparing the risk and return of the account to the Trust Funds Investment Pool (TFIP) benchmark, the Short-Term Investment Pool (STIP) benchmark, each weighted proportionately to the portfolio's holdings, over a five (5) year moving average.
- C. Time Horizon

1. The Hail Insurance Fund is a reserve account. The Board expects to meet or exceed all objectives over a long-term investment horizon. Over shorter periods, the anticipated market volatility, and specific actions, including risk mitigation efforts of the Board, may lead to unfavorable, but expected deviation from these objectives.

D. Investment Guidelines

1. The Board will have full discretion to manage the Hail Insurance Fund portfolio consistent with the investment guidelines stated below. Compliance with the following guidelines for permitted investments and other restrictions is the sole responsibility of the Staff. Any exceptions or compliance violations are to be reported to the Board at the next scheduled quarterly Board meeting.

E. Permitted Investments

1. The Hail Insurance Fund may only invest in the following:
 - a) TFIP.
 - b) STIP or any cash vehicle at the Custodial Bank.

F. Other Restrictions

1. A maximum of ninety percent (90%) of the market value of the portfolio will be invested in the TFIP based on annual average market value.
2. A minimum of ten percent (10%) in the STIP based on annual average market value.

- G. If at any time, due to market fluctuations or any other circumstances, any of the guidelines are not maintained, Staff will use its best efforts to conform to these limits in a timely manner, while considering current market conditions and the associated costs of rebalancing. At the Board's next regularly scheduled quarterly meeting, the CIO shall inform the Board of any cases that the allocations were outside the limits and either inform the Board of the actions that were taken to return the portfolio back within guidelines or a plan to do so.

BOI TERMINOLOGY

ACTIVE MANAGEMENT (typically with respect to stocks)

Investment method which involves hiring a manager to research securities and actively make investment decisions to buy and sell securities in an effort to outperform an assigned index, rather than purchasing a portfolio of securities that would simply replicate the index holdings (*'passive'* investing).

ACTUARIAL ASSUMED RATE (pension concept)

The investment return rate used by actuaries that enables them to project the investment growth of retirement system assets into the future (typically perpetual).

ACTUARIAL FUNDING STATUS (pension concept)

A measurement made by actuaries to measure a pension system's financial soundness (ratio of actuarial liabilities to the actuarial value of the assets available to pay the liabilities).

ALPHA (investment term)

Return on an investment portfolio in excess of the market return or benchmark return; generally used in the context of *'active'* management (as passive management, by definition, does not seek excess returns, or *'alpha'*).

ALTERNATIVE INVESTMENTS

A wide range of investments, other than traditional assets such as publicly traded stocks and bonds. The most common nontraditional or alternative investments are private equity, real estate, commodities, and hedge funds.

ARBITRAGE (bond program)

A structural or systematic difference between investment types which may allow profiting from the *'difference,'* i.e., arbitrage. The most common context for the use of *'arbitrage'* at the BOI is the federal law that prevents *'arbitrage,'* i.e., the profiting of investing tax-exempt securities (e.g., INTERCAP) into taxable yields investments (such as U.S. Treasuries).

ASSET ALLOCATION AND ASSET ALLOCATION RANGE (general investment principle)

The Board's invested assets are divided or allocated into various asset classes such as stocks and bonds, each with its own characteristics, with the objective of attaining an optimal mix of risk and return. The total expected return of a portfolio is primarily determined by the mix or allocation to its underlying assets classes. Given the importance of *'asset allocation,'* the BOI Board sets the asset allocation *'range'* for each broad investment type or asset class.

ASSET-BACKED SECURITY

Bonds or notes backed by loan paper or accounts receivable originated by banks, credit card companies, or other providers of credit. Not mortgages.

AVERAGE LIFE (fixed income, particularly bonds)

The average time period the debt is expected to be outstanding. This is typically the maturity date for a traditional bond structure; however, it will be shorter for bonds having a sinking fund or amortizing payment structure.

BANKER'S ACCEPTANCE

A short-term credit investment which is created by a non-financial firm and whose payment is guaranteed by a bank. Often used in importing and exporting, and as a discount money market fund investment.

BARCLAY'S AGGREGATE INDEX (fixed income)

A composite of outstanding bond issues, including corporate, structured, and government bonds whose overall investment features such as return and investment type are tracked over many years. This is the most common benchmark used for comparing the performance of a portfolio that invests in U.S. investment grade fixed income securities. Formerly known as the Lehman Aggregate bond index.

BASIS POINTS (investment jargon)

A basis point is 1/100th of a percentage. Ten basis points is one tenth of a percent, typically written as 10 bps.

BENCHMARK (standard investment concept)

The concept of employing a particular independent or market investment return as a measurement to judge an investment portfolio's return; typically chosen investment benchmarks have the following attributes: they are investible, quantifiable, chosen in advance, easily understandable, and have a long history; common examples are the S & P 500 Index and the Barclay's Aggregate Index.

BETA (investment jargon)

A measure of the risk (or volatility) of a security or a portfolio in comparison to the market as a whole. If the stock or portfolio moves identically to that market, its beta value is 1; if its price volatility (or movement) is greater than that market's price volatility, it is said to have beta greater than 1.

CAP, AS IN LARGE 'CAP' (generally for stocks, e.g., public equities)

'Cap' is short for capitalization, as a reference to the market value of a publicly-traded company. The current stock price times the total shares outstanding of the company equals its market capitalization or market 'cap'; often used contextually such as 'large-cap,' 'mid-cap,' and 'small-cap' for different sized public companies.

CERTIFICATE OF DEPOSIT (CD):

A short-or medium-term, interest-bearing deposit obligation offered by banks and savings and loans. These may include "Yankee CDs" which are CDs issued by foreign banks or their U.S. affiliates in the U.S. which are denominated in U.S. dollars

CLAWBACK (private equity)

A clause in the agreement between the general partner and the limited partners of a private equity fund. The clawback gives limited partners the right to reclaim a portion of distributions to a general partner for profitable investments based on significant losses from later investments in a portfolio which ultimately resulted in the general partner receiving more distributions than it was legally entitled to.

COMMERCIAL PAPER

An unsecured obligation issued by a corporation or bank to finance its short-term credit needs, such as accounts receivable and inventory. Maturities typically range from two (2) to two hundred seventy (270) days. Commercial paper is available in a wide range of denominations, can be either discounted or interest-bearing, and usually a limited or nonexistent secondary market. Commercial paper is usually issued by companies with high credit ratings, meaning that the investment is almost always relatively low risk.

CORE (context varies for equity, fixed income, real estate)

In equity and fixed income, 'core' refers to investments that are generally always found in the portfolio and normally expect to hold for a very long time e.g. 'core' holdings of the largest U.S. companies, or U.S. treasuries; in real estate, 'core' generally refers to the best quality of real estate holdings such as prime commercial property in major metropolitan cities that have low leverage and low levels of vacancy.

CORPORATE NOTE

A type of unsecured debt issued by a corporation that may be longer-term than Commercial Paper, but shorter-term than a typical Corporate Bond.

CORRELATION (common statistical concept)

A measure of how two or more investment values or two asset classes move relative to each other during the same time period. A central concept in portfolio construction is to seek investments whose values do not move *together* at the same time, i.e., are uncorrelated. A correlation of 1 means that two or more investments 'move' precisely together.

CREDIT ENHANCEMENT (bond program)

At BOI, the term generally refers to credit support or a bond or loan guarantee. For example, the Board's INTERCAP bonds are 'enhanced' by the BOI's performance guarantee bringing down the yearly interest rate.

CUSTOM BENCHMARK (or sometimes custom index)

A way to measure investment performance using a tailor-made measurement versus a generic industry-standard benchmark. At the BOI, total pension performance is measured against the Board's 'custom index' or 'custom benchmark' which is a weighted blend of all the underlying asset class benchmarks used to measure the asset class returns.

DERIVATIVES (investment jargon)

Investment securities whose performance itself depends (or is 'derived') from another underlying investment return. Examples include stock options, puts/calls, and forward currency contracts whose returns are based on the underlying stock or currency.

DEVELOPED MARKETS (equity)

Countries having a long period of stable industrialization; or are the most economically developed.

DISCOUNT (fixed income, generally)

Used most often with respect to bonds, the price paid that is less than face (or 'par') value. A \$1 million face-value of a bond purchased for less than a million is bought at a 'discount.' Described as the difference between a bond's current market price and its face or redemption value.

DIVERSIFICATION (standard investment concept)

The concept of spreading risk by putting assets in several investment categories, each having different attributes with respect to type, expected return, risk, and correlation, to best protect against the risk of loss.

DURATION (bonds)

Almost exclusively used when discussing fixed income bonds, a measurement of how sensitive a bonds' change in price is to a change in general market interest rates, expressed in years (specifically calculated as a weighted average term to maturity of the bond's cash flows). The greater the duration of a bond, the greater the volatility of price for changes in market interest rates.

EFFICIENCY (usually when discussing various stock markets)

Used to describe markets where it is very difficult to achieve return in excess of that of the overall market from individual stock selection. When information is widely available on a company and its securities are traded regularly the market is considered 'efficient.'

EMERGING MARKETS (most often for public equities)

Certain international securities markets that are typically small, new, have low turnover, and are located in countries where below-average income prevails and is developing in response to the spread of capitalism.

ENHANCED (pertaining to stocks)

Generally linked with 'index' as in enhanced index, an indexed investment management style that has been modified to include the portfolio manager's idea of how to outperform the index by omitting some stocks in the index and overweighting others in a limited manner designed to enhance returns but at minimal risk.

EXCESS RETURNS (standard investment concept)

Returns are 'excess' if they are more than the market or more than the benchmark they are measured against.

EXEMPT STAFF VS. CLASSIFIED STAFF (specific to Montana state government)

"Exempt" refers to the Board's eleven employees who, under state law, do not fall under the state's standard employment rules (the 'classified' staff).

FIDUCIARY (from the Latin verb, fidere, to trust)

The concept of trust and watchfulness; a fiduciary is charged with the responsibility of investing the money wisely for the beneficiary's benefit. Board members are the ultimate 'fiduciaries' for the Board's assets and are obligated to be a good agent.

FTE (state government jargon)

An acronym in state government: "full time equivalent" as in full time employee. The concept is a slot or position, not the actual individuals. The BOI is currently authorized for 32 FTE's.

FUND OF FUNDS (private equity)

A concept used in alternative investments referring to using an investment manager to invest in **other** managers or funds, as opposed to making direct investments in funds.

GAAP/GASB (accounting terminology)

GAAP...Generally Accepted Accounting Principles; Montana state law uses GAAP accounting principles unless specifically allowed otherwise. GASB...Government Accounting Standards Board, the board that sets GAAP standards for U.S. governments (FASB...Financial Accounting Standards Board, the entity for commercial and business accounting standards).

GENERAL OBLIGATION (municipal finance term)

Used to describe the promise that a government makes to bond holders, backed by taxing and further borrowing power, it is generally considered the highest level of commitment to bondholders. At the local government level, general obligation bonds typically require a vote of the residents.

GENERAL PARTNER VS. LIMITED PARTNER (private equity)

In private equity, the general partner is responsible for the operations of the partnership and makes the actual underlying investment decisions; the limited partner is the investor, and therefore has limited liability for investment decisions; the BOI is the 'limited' partner in its private equity fund investments (and real estate funds as well).

GROWTH (as to style public equities)

An investment style that more heavily invests in companies whose earnings are expected to grow at an above average rate to the market. A growth stock usually does not pay a dividend, as the company would prefer to reinvest retained earnings in capital projects to grow the company (vs. 'value,' which considers buying established companies they feel are trading at bargain prices to the fundamental analysis of the company's financial statements and internal competitive factors).

INDENTURE (bond and loan programs)

The central document describing the contract between investors and the borrower or user of the proceeds. The Board's INTERCAP program is structured around a bond indenture.

HEDGE FUND (as defined by Investopedia)

An aggressively managed portfolio of investments that uses advanced investment strategies such as *leverage*, long, short and *derivative* positions in both domestic and international markets with the goal of generating high returns (either in an absolute sense or over a specified market *benchmark*).

HURDLE RATE (private equity)

a minimum return per annum that must be generated for limited partners of a private equity fund before the general partner can begin receiving a percentage of profits from investments.

INDEX (investment concept)

Typically, a single measure of a broadly-based group of investments that can be used to judge or be compared to the return performance of an individual investment or manager.

INDEXING (investment concept)

Typically refers to investing in a portfolio to match a broad range of investments that are set within a pre-determined grouping, such as the S&P 500, so as to match its performance; such investing is generally labeled 'passive' or indexed investing; or buying shares in an Index Fund.

IN-STATE LOAN PROGRAM (Montana-specific)

Programs that are funded by the state's coal severance tax monies.

INTERNAL SERVICE VS. ENTERPRISE FUND (state accounting concept)

Within Montana state government: a program whose funding is dependent on **mandatory participation** by another state government program is labeled an 'internal' service fund; a program whose funding is dependent on voluntary participation is labeled an enterprise fund. At BOI, the investment program is an internal service fund because participation is not voluntary; the Board's bond and loan programs, because their use is voluntary, are accounted for as an enterprise.

INVESTMENT GRADE (bonds)

Bond ratings from Moody's, Standard and Poor's, and Fitch high enough to be considered secure enough for most investors (bonds rated AAA – BBB). Below investment-grade bonds (below BBB) are generally considered to have a more speculative outlook and carry more risk of default.

IRR (private equity)

A measure of investment performance, short for 'internal rate of return,' expressed as a percentage (the 'internal rate of return' number, or discount rate) that mathematically will equalize the total future cash flows of an investment to the initial cash outflow of the investment, the concept accounts for the time value of money.

LEVERAGE (investment concept)

As an investment concept, a way to increase a return on an investment through a combination of one's own money and by borrowing additional money to enhance such an investment; high 'leverage' is also associated with high risk.

LINK DEPOSIT

The Link Deposit program can provide a financial institution a long-term fixed rate funding source "linked" to a specific loan. The State of Montana provides the financial institution funding in the form of a deposit through the Montana Board of Investments using coal tax funds.

MASTER LIMITED PARTNERSHIP

An investment structure that combines the tax benefits of a limited partnership with the liquidity of a common stock. While an MLP has a partnership structure, it issues shares that trade on an exchange like common stock. MLPs are often broadly associated with energy companies operating in midstream services.

MEAN VARIANCE OPTIMIZATION MODEL ('Modern Portfolio Theory')

A theory that it is possible to construct a portfolio to maximize the return for the least amount of risk or volatility. This theory is based on various asset types and their level of expected return, risk (volatility) and their correlation with each other or how the asset values move with each other. The central idea of the model is to blend investments so that in total, they provide both the best expected return and optimal amount of diversification to minimize deep performance swings (volatility); a central tenant is that long term historical returns are indicative of future returns.

MEZZANINE FINANCE (private equity)

Subordinated debt with an equity 'kicker' or ability to share in the equity value of the company. It is typically lower quality because it is generally subordinated to debt provided by senior lenders such as banks, thus is considered higher risk.

MULTIPLE (as in "multiple" of invested capital, private equity)

The ratio of total cash returned over the life of the investment plus the investment's residual value over the total cash expended in making the investment. A multiple of 2 means, regardless of the total investment time period, that total cash returned was twice the cash invested.

130/30 STRATEGY (public equities)

Also called 'partial long short,' this strategy involves the establishment of a short position in select stocks while taking the proceeds of those shorts and buying additional long positions in stocks. The net effect is an overall market position that is 100% long, but the active decisions on individual stock selections are amplified by this ability to short. If the stock selections are successful, the strategy enables the portfolio to profit more than if a stock had simply not been owned, as with traditional long-only portfolios.

OPPORTUNISTIC (real estate)

In real estate, a euphemism for the most risky real estate investments, typically distressed, raw land, newly developed buildings or other high risk investments in the real estate sector, (versus, 'core,' which are the best quality fully leased commercial properties).

OVERWEIGHT OR UNDERWEIGHT (investment concept)

Generally, the level of holdings of a certain type of investment that is above or below either a benchmark's weight (portion of total investment), or the percentage held of a particular asset class compared to the Board's asset allocation policy weight. Also used to describe an external investment manager's decision to have more (or less) of a particular investment than the percentage or weighting found in the benchmark.

P/E RATIO (equity)

The price of a publicly traded stock divided by its estimated or actual earnings is the price/earnings or P/E ratio. This can also be calculated for a stock index or portfolio of stocks. Over the last 100 years, the S&P 500 has had an overall P/E ratio of about 15, or a total index price of about 15 times the annual earnings of its underlying companies.

PACING STUDY (private equity)

An analysis of the likely timing and amount of the drawdown of committed but yet uninvested monies and the estimated distributions or returns from the funds held in an alternative investment portfolio, generally used to judge the future size of the portfolio and its potential liquidity needs, i.e., cash funding demands.

PAR (fixed income)

The initial principal amount designated by the issuer of the bond, or face value of a bond.

PASSIVE

For investments, generally not materially participating in an investment decision, meaning an investment portfolio whose returns follows that of a broad market index, such as an investable stock index, i.e. the S & P 500.

PASSIVE MANAGEMENT OR PASSIVE INVESTMENT (most often in public equities, but not exclusively)

An investment style where a fund's portfolio mirrors a market index, such as the S&P 500, with limited selection decisions by the manager, resulting in market returns. Passive management is the opposite of active management in which a fund's manager attempts to beat the market with various investment strategies and buy/sell decisions of a portfolio of securities to enhance returns.

PASSIVE WEIGHT (generally equities)

The percentage of a stock held in a particular index portfolio, or percentage of an overall asset class that is held in passive portfolios.

POLICY PORTFOLIO

A fixed-target asset allocation, as opposed to asset allocation ranges, which theoretically allows gauging whether deviations from the target portfolio had a positive or negative impact on overall performance.

PORTABLE ALPHA (public equities)

An investment strategy which involves the active selection of securities while neutralizing overall beta or market risk. This often involves the use of derivative investments such as futures to replicate the market return, either taking a short or long position, while then selecting securities which are expected to add return in an absolute sense or in addition to the market return. As an example, this strategy can be found with certain hedge funds where a market exposure is shorted while individual securities such as specific stocks are purchased that are expected to outperform the general market. The concept of portable applies when the ability to generate positive alpha can be overlaid or ported onto a portfolio. This is not a strategy employed by any of MBOI's existing managers.

PREMIUM (fixed income)

Most often the amount paid over the stated face amount (often called 'par') of a bond, but also used in other contexts, typically paying more (the premium) than a market price (as in a take-over bid for a company).

PRIVATE ANNUAL WAGE

The private annual wage is determined annually by the Montana Department of Labor & Industry using the average annual employment divided by the total wages.

PROXY (publicly traded companies)

An agent legally authorized to act on behalf of another party. Shareholders not attending a company's annual meeting may choose to vote their shares by proxy by allowing someone else to cast votes on their behalf, but the word 'proxy' is used more frequently colloquially as a 'close approximation.'

PRUDENT EXPERT, PRUDENT PERSON (a central fiduciary concept)

These legal terms have long histories of court-determined standards of care, deriving originally under English common law. The BOI is empowered to operate under the 'prudent expert rule,' which states that the Board shall manage a portfolio:

- a) *with the care, skill, prudence, and diligence, under the circumstances then prevailing, that a prudent man acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims;*
- b) *diversify the holdings of each fund within the unified investment program to minimize the risk of loss and to maximize the rate of return unless, under the circumstances, it is clearly prudent not to do so; and*
- c) *discharge the duties solely in the interest of and for the benefit of the funds forming the unified investment program.*

At an 'expert' level; there is more room for accepting risk under the prudent expert rule than the prudent person rule.

REBALANCING (general investment term)

The process of realigning the weightings of the portfolio of assets. Rebalancing involves periodically buying or selling assets in the portfolio to maintain the original desired level of asset allocation and/or to stay within predetermined asset category range; it is part of a disciplined investment approach within modern portfolio theory.

REPURCHASE AGREEMENT

A contract in which the seller of securities, such as Treasury Bills, agrees to buy them back at a specified time and price. May also be called "Repo" or "Buyback." Typically used as a short-term form of collateralized borrowing by a bank or securities dealer.

RESOLUTION (government term)

Generally, a formal and written action by a governmental (or corporate) body that has long term significance and requiring a vote of the governing body. BOI uses 'resolutions' generally only for its most significant and long term actions and/or policies.

REVERSE REPURCHASE AGREEMENT

A purchase of securities with an agreement to resell them at a higher price at a specific future date. The investor essentially borrows money and allows its securities to be held as collateral. Reverse Repurchase Agreements occur most often in government securities or other securities that are highly valued and thus considered a good form of collateral.

SECURITIES LENDING (general investment)

Investments that are temporally borrowed by other investors for a fee; the BOI allows most of its publicly traded investments to be loaned for additional marginal income.

STANDARD DEVIATION (common statistical concept)

A specific statistic that measures the dispersion of returns from the mean over a specific time period to determine the "historical volatility" of returns for a stock, or portfolio, or asset class; more specifically a single unit (i.e., one standard deviation) of dispersion that accounts for approximately 66% of all data around a mean using a 'normal' (or 'uniform' or 'bell-shaped' curve; as opposed to a skewed or asymmetrical) distribution. The standard deviation is used as a gauge for the amount of expected future volatility.

SABHRS (accounting jargon)

Montana state government's State Accounting, Budgeting and Human Resource System; the State's central information management system. BOI investment and other financial data must tie and be reported on this system, which is the official book of record and includes the state's financial statements.

STYLE DRIFT (often in reference to public equity managers, but applicable to other managers, too)

As the name implies, a divergence from an investor's professed investment bias or style or objective.

TRANCHE

A division or portion of a pool or whole; specifically: an issue of bonds derived from a pooling of like obligations (such as securitized mortgage debt) that is differentiated from other issues especially by maturity or rate of return.

TRACKING ERROR (statistical concept in investments)

A measurement of the standard deviation of a portfolio's return versus the return of the benchmark it was attempting to outperform. The concept is often used when discussing investment managers. For example, some styles are expected to have high 'tracking errors,' (e.g., deep 'value' investors who buy companies that may be dogs for years), versus passive managers, whose stock volatility is expected to be very close to their benchmark. Tracking error can either be intentional or unintentional; it can also be regarded as an accepted deviation or contrary to the management agreement. High *unexpected* tracking error is generally a serious concern to be examined and understood.

UNDERWRITER (bond program)

In investments, the agent who buys investments to be resold to the public; at BOI, the investment firms that buy the Board's bonds to be resold to the public.

UNIFIED INVESTMENT PROGRAM (Montana Constitution)

The Program in the State's constitution requiring a central investment program which the legislature has assigned to the BOI.

VALUE (as to style when discussing public equities)

An investment style that focuses on buying established companies that investors believe are undervalued and trading at bargain prices to the fundamental analysis of the company's financial statements and internal competitive factors.

VENTURE CAPITAL (private equity)

A higher-risk/high-return type of investing in startup firms and small businesses with perceived long-term growth potential. Sometimes these are already existing business ventures with limited operating history that need additional management expertise and access to capital. (For start-ups, 'seed capital,' or 'angel investor' are terms differentiating this even higher risk type of investment.)

VOLATILITY (investment jargon)

A statistical measure of the dispersion of returns for a given security or market index. Volatility is typically measured by using the standard deviation of returns from the security or market index. Commonly, the higher the volatility, the riskier the security.

YIELD (general investment, but most often within fixed income)

The amount returned to the investor above the original investment generally expressed as a percentage. Yield can be thought of as the expected return from the combination of interest and price accrual or amortization to maturity (in the case of a bond trading at a discount or premium to par).

YIELD CURVE (fixed income)

A line that plots the prevailing interest rates at a given time for bonds ranging in maturity from as short as three months out to 30 years. When plotted across these various maturities (typically 2, 5, 7, 10 and 30 years), the resultant line is shaped like a curve with generally low interest rates (the yield) for shorter maturities and gradually higher interest rates for longer maturities, because generally investors demand higher interest rates for longer term investments. The yield curve for U.S. Treasury debt is the most common when referring to the prevailing level of interest rates.

MONTANA BOARD OF INVESTMENTS ACRONYM INDEX

ACH	Automated Clearing House
ADV.....	Uniform Application for Investment Adviser Registration and Report by Exempt Reporting Advisor
AUM	Assets Under Management
ADR	American Depository Receipts
AOF	All Other Funds
ARC	Actuarially Required Contribution
BOI.....	Board of Investments
CAPP	Consolidated Asset Pension Pool
CFA.....	Chartered Financial Analyst
EM.....	Emerging Market
FOIA.....	Freedom of Information Act
FWP	Fish Wildlife and Parks
FX	Foreign Exchange
IPS	Investment Policy Statement
IRP	Intermediary Relending Program
LDI	Liability-Driven Investing
MBOH	Montana Board of Housing
MBOI.....	Montana Board of Investments
MDEP.....	Montana Domestic Equity Pool
MLP	Master Limited Partnership
MFFA	Montana Facility Finance Authority
MPEP	Montana Private Equity Pool
MPT	Modern Portfolio Theory
MSTA.....	Montana Science and Technology Alliance
MTIP	Montana International Pool

MTRP Montana Real Estate Pool

MTSBA..... Montana School Boards Association

MVO.....Mean-Variance Optimization

NAV..... Net Asset Value

PERS Public Employees' Retirement System

PFL Partnership Focus List

QZAB Qualified Zone Academy Bonds

QSCB..... Qualified School Construction Bonds

RFBP Retirement Funds Bond Pool

RFP..... Request for Proposal

SABHRS Statewide Accounting Budgeting and Human Resource System

SLQT..... Securities Lending Quality Trust

SOC1Service Organization Controls 1 (Audit)

SSBCI State Small Business Credit Initiative

STIP Short Term Investment Pool

TFBP..... Trust Funds Bond Pool

TFIP Trust Funds Investment Pool

TIF.....Tax Increment Financing

TIFD Tax Increment Financing District

TRS..... Teachers' Retirement System

TUCS Trust Universe Comparison Service

UIP.....Unified Investment Program

VIX Volatility Index

ASSET CLASS ACRONYMS

DEPAC.....	Domestic Equity Pension Asset Class
IEPAC	International Equity Pension Asset Class
PEPAC.....	Private Equity Pension Asset Class
NRPAC	National Resources Pension Asset Class
REPAC.....	Real Estate Pension Asset Class
TIPAC	TIPS Pension Asset Class
BFPAC	Broad Fixed Income Pension Asset Class
USPAC.....	UST/AGY Pension Asset Class
IGPAC.....	Investment Grade Corp Pension Asset Class
MBPAC	MBS Pension Asset Class
HYPAC.....	High Yield Pension Asset Class
DSPAC.....	Diversified Strategies Pension Asset Class
CPAC	Cash Pension Asset Class

2022 Board of Investments Meetings

JANUARY						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

FEBRUARY						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

MARCH						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

MAY						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JUNE						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

JULY						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

AUGUST						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

SEPTEMBER						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

OCTOBER						
S	M	T	W	T	F	S
					1	
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

NOVEMBER						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

DECEMBER						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

[Board Materials Due](#)
[Board Packet Mailing](#)
[Board Meeting Dates](#)

BOI WORK AND EDUCATION PLAN

2022

2023

February 16-17

Education:

Outreach Efforts for the Board - In-State Loan and INTERCAP Programs
Short Term Investment Pool

Reports:

Ethics Policy
Disaster Recovery and Emergency Preparedness
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Financial Audit Report

April 20

Education:

Domestic Equity Asset Class Review
RVK Annual Capital Market Assumptions

Reports:

Benchmarks Used by the Board

May 25-26

Education:

MT Buildings (Board as Landlord/Tenant Holdings)
Investment Policy Statement Review
Real Estate Asset Class Review

Reports:

Budget Status FYTD
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Accounting Staff Review
HR: Staffing Level Review
HR: Exempt Staff Compensation Review

August 3-4

Education:

Core Fixed Income Asset Class Review
Budget Proposal for FY24-25

Reports:

Proxy Voting
Budget Status Prior FY
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: SOC I, Type 2 Report

October 26-27

Education:

Separate Accounts Investment Review
First Reading - Asset Allocation Range Recommendation

Reports:

CEM, Inc Cost Reporting Analysis

Committee Meetings:

HR: Exempt Staff Performance Review

December 6-7

Education:

2023 Legislative Session
Policy 217 - Reauthorization of Investment Vendors
Adoption - Asset Allocation Range Approval

Reports:

Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Annual Report and Financial Statements

February TBD (2Day)

Education:

Cash Management of State Monies
Custodial Banking Relationship and Continuity

Reports:

Ethics Policy
Disaster Recovery and Emergency Preparedness
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Financial Compliance Audit Report

April TBD (1Day)

Education:

International Equities Asset Class Review
RVK Annual Capital Market Assumptions

Reports:

Benchmarks Used by the Board

May TBD (2Day)

Education:

State Government Customer Relationships
Investment Policy Statement Review
Real Assets Asset Class Review

Reports:

Budget Status FYTD
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Accounting Staff Review
HR: Staffing Level Review
HR: Exempt Staff Performance and Compensation Review

August TBD (2Day)

Education:

Trust Funds Investment Review
Non-Core Fixed Income Asset Class Review

Reports:

Budget Status Prior FY
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: SOC I, Type 2 Report

October TBD (1Day)

Education:

Private Investments Asset Class Review
First Reading - Asset Allocation Range Recommendation

Reports:

Securities Lending

Committee Meetings:

HR: Exempt Staff Performance Review

November TBD (2Day)

Education:

MPERA and TRS Relationship
Policy 217 - Reauthorization of Investment Vendors
Adoption - Asset Allocation Range Approval

Reports:

Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Annual Report and Financial Statements