

## Summary of FY 2019 Public Retirement System Actuarial Valuations<sup>6</sup>

Compiled by Sheri Scurr, Legislative Services Division

Source: TRS Board and PER Board Actuarial Valuations and Board of Investments Data, as of June 30, 2019

System	Funded Ratio <sup>1</sup> (compared to FY 2018)	Covered Payroll <sup>2</sup> on June 30, 2019	ARC <sup>3</sup> Shortfall (% payroll) <sup>4</sup> (compared to FY 2018)	ARC Shortfall (as dollar amt increases annually) <sup>5</sup>	Amortization period (compared to FY 2018)
PERS-DB	74% (74%)	\$1,247,343,733	0.71% (0.87%)	\$8,856,140	36 (38) years
TRS	69% (68%)	\$857,468,000	0% (0.4%)	\$0	29 (31) years
SRS	82% (81%)	\$80,461,048	0%	\$0	21 (21) years
MPORS	69% (68%)	\$54,282,431	0%	\$0	18 (20) years
GWPORS	84% (83%)	\$51,676,963	0.89% (1.15%)	\$459,925	53 (72) years
FURS	80% (78%)	\$50,756,445	0%	\$0	9 (10) years
HPORS	65% (64%)	\$15,177,612	4.34% (3.72%)	\$658,708	42 (40) years
JRS	161% (161%)	\$7,382,476	0%	\$0	0 (0) years
<b>TOTAL</b>				<b>\$9,974,774</b>	

**Notes:**

1. "Funded Ratio" means current assets compared to current liabilities. When a plan is 100% funded, it means current assets are sufficient to pay 100% of current liabilities (which include future benefit obligations). The percentages in this column are rounded.
2. "Covered Payroll" means the annual salaries of all active members on June 30.
3. "ARC" means the Annual Required Contribution rate required to amortize the unfunded liabilities over 30 years as determined by the system's actuary. Unfunded liabilities are the liabilities that cannot be paid with current assets, but that are being paid off over time. This time period is called the "amortization period".
4. The "ARC shortfall" as a percent of payroll is the contribution rate increase (i.e., contributions above current contributions) needed to amortize the system's unfunded liabilities in 30 years. If a plan's liabilities are being paid off within 30 years or less, actuaries consider the system actuarially sound.
5. The ARC shortfall as a dollar amount is the estimated amount of money required in the first year of the biennial budget, in addition to current contributions to amortize the system's unfunded liabilities in 30 years. The actual amount will change as payroll changes.
6. Actuarial valuations are based on economic and demographic assumptions. The governing boards have the constitutional duty to adopt these assumptions, and they do so based on experience studies. Experience studies are conducted approximately every 5 years. The legislature may not alter these assumptions, but may request information based on different assumptions. The main actuarial assumptions for the FY 2019 actuarial valuations were as follows:

Main Economic Assumptions on June 30, 2019	TRS	MPERA Systems
Investment rate of return	7.50% assumption  5.69% FY 2019 actual market return, 7.00% smoothed return	7.65% assumption  5.58% FY 2019 actual market return, 7.13% smoothed return
Wage growth	3.25%	3.50%
Inflation	2.50%	2.75%

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Source: TRS Board and PER Board Actuarial Valuations and Board of Investments Data, as of June 30, 2018

*With latest corrections as of Dec. 1, 2019*

System	Funded Ratio <sup>1</sup> (percentage)	Covered Payroll <sup>2</sup> on June 30, 2018	ARC <sup>3</sup> Shortfall (% payroll) <sup>4</sup>	ARC Shortfall (as dollar amt increases annually) <sup>5</sup>	Amortization period
PERS-DB	74%	\$1,230,105,350	0.87%	\$10,701,917	38 years
TRS	68%	\$829,709,000	0.04%	\$332,000	31 years
SRS	81%	\$77,587,294	0%	\$0	21 years
MPORS	68%	\$52,035,958	0%	\$0	20 years
GWPORS	83%	\$50,823,150	1.15%	\$584,466	72 years
FURS	78%	\$47,934,517	0%	\$0	10 years
HPORS	64%	\$15,251,339	3.72%	\$567,349	40 years
JRS	161%	\$7,290,904	0%	\$0	0 years
<b>TOTAL</b>				<b>\$12,185,732</b>	

Notes:

1. "Funded Ratio" means current assets compared to current liabilities. When a plan is 100% funded, it means current assets are sufficient to pay 100% of current liabilities (which include future benefit obligations). The percentages in this column are rounded.
2. "Covered Payroll" means the annual salaries of all active members.
3. "ARC" means the Annual Required Contribution rate required to amortize the unfunded liabilities over 30 years as determined by the system's actuary. Unfunded liabilities are the liabilities that cannot be paid with current assets, but that are being paid off over time. This time period is called the "amortization period".
4. The "ARC shortfall" as a percent of payroll is the contribution rate increase (i.e., contributions above current contributions) that is needed to amortize the system's unfunded liabilities in 30 years. If a plan's liabilities are being paid off over a period of 30 years or less, actuaries consider the system actuarially sound.
5. The ARC shortfall as a dollar amount is the estimated amount of money required in the first year of the biennial budget, in addition to current contributions to amortize the system's unfunded liabilities in 30 years. This amount was calculated by legislative staff, so is not in the valuations, and is based on the June 30, 2018, snapshot of payroll. The actual amount will change as payroll changes.
6. Actuarial valuations are based on economic and demographic assumptions. The governing boards have the constitutional duty to adopt these assumptions, and they do so based on experience studies. Experience studies are conducted approximately every 5 years. The legislature may not alter these assumptions, but may request information based on different assumptions. The main actuarial assumptions for the FY 2018 actuarial valuations were as follows:

Main Economic Assumptions on June 30, 2018	TRS	MPERA Systems
Investment rate of return	7.50%	7.65%
Wage growth	3.25%	3.50%
Inflation	2.50%	2.75%

**Sensitivity to Future Experiences:**

Each actuarial valuation includes a section on how sensitive estimated costs of benefits are to changes in the assumed rate of return on investments. The table below shows what the funded ratio and amortization period would be if the actuary were to assume a lower investment rate of return effective July 1, 2018.

**0.5% Lower**

7.15% Investment Return Assumption - MPERA  
7.0% Investment Return Assumption - TRS

<b>System</b>	<b>Funded Ratio<sup>1</sup></b>	<b>Amortization period</b>
PERS-DB	70%	55 yrs
TRS	65%	46 yrs
SRS	75%	113 yrs
MPORS	63%	30 yrs
GWPORS	77%	Does Not Amortize
FURS	73%	15 yrs
HPORS	60%	77 yrs
JRS	154%	0 yrs

**1.0% Lower**

6.65% Investment Return Assumption - MPERA  
6.5% Investment Return Assumption - TRS

<b>System</b>	<b>Funded Ratio<sup>1</sup></b>	<b>Amortization period</b>
PERS-DB	66%	Does Not Amortize
TRS	61%	90 yrs
SRS	71%	Does Not Amortize
MPORS	60%	53 yrs
GWPORS	71%	Does Not Amortize
FURS	68%	24 yrs
HPORS	56%	Does Not Amortize
JRS	146%	0 yrs

**Table 1 – CONTRIBUTIONS AND NORMAL COSTS**

	TEACHERS' RETIREMENT SYSTEM (TRS) 1937	PERS DEFINED BENEFIT PLAN (PERS-DBRP) 1945	JUDGES (JRS) 1967	HIGHWAY PATROL OFFICERS' (HPORS) 1945	SHERIFFS' (SRS) 1974	GAME WARDENS' AND PEACE OFFICERS' (GWPORS) 1963	MUNICIPAL POLICE OFFICERS (MPORS) 1974	FIREFIGHTERS' UNIFIED (FURS) 1981
Employer contributions FY19	<p><b>Schools/cc/local gov't:</b> 7.47% - base <u>1.5% - supplemental*</u> 8.97%</p> <p><b>State &amp; MUS:</b> 9.85% - base <u>1.5% - supplemental*</u> 11.35%</p> <p>*increases 0.1% each FY to cap of 2%</p>	<p><b>Local gov't:</b> 6.8% - base <u>1.77% - additional*</u> 8.57%</p> <p><b>State &amp; MUS:</b> 6.9% - base <u>1.77% - additional*</u> 8.67%</p> <p><b>Schools:</b> 6.8% - base <u>1.5% - additional*</u> 8.30%</p> <p>*increases 0.1% each FY to cap of 2%</p>	25.81%	<p><b>7/1/13</b> 28.15%</p>	10.115%	9.00%	14.41%	14.36%
Employee contributions FY19	<p><b>Tier One (pre-7/01/13):</b> 7.15% plus 1% supplemental contribution until system is 90% funded</p> <p><b>Tier Two (7/1/13):</b> 8.15%</p>	7.90%	7.00%	<p><b>Pre-7/1/97</b> 13%</p> <p><b>7/1/97 or elected GABA):</b> 13.05%</p>	9.245%	10.56%	<p><b>6/30/75</b> 7.0%</p> <p><b>7/1/97</b> 8.5%</p> <p><b>7/1/97 or elected GABA</b> 9%</p>	<p><b>Pre-7/1/97</b> 9.5%</p> <p><b>7/1/97 or elected GABA</b> 10.7%</p>
Additional funding from other sources FY 18  (dollar amts. from LFD)	<p><b>State GF:</b> \$25 million plus 2.38% for schools/cc <u>0.11% for all</u> \$45 million</p> <p><b>U- System:</b> 4.72% of MUS-RP payroll = \$1.8 million</p>	<p><b>State GF:</b> \$31.4 million 0.10% for local gov't <u>0.37% for schools</u> \$32.4 million</p>	None	<p><b>State GF:</b> 10.18% (\$1.7 million)</p>	None	None	<p><b>State GF:</b> 29.37% (\$16 million)</p>	<p><b>State GF:</b> 32.61% (\$16.2 million)</p>
Normal cost of benefits as they accrue FY18	9.96%	10.27%	17.25%	11.09%	15.94%	16.09%	16.78%	14.25%

Montana's Public Employees' Retirement Plans: Summary Tables  
(Source: FY 2018, Actuarial Valuations)

**Table 2 – ACTUARIAL DATA**

	TEACHERS' RETIREMENT SYSTEM (TRS) 1937	PERS DEFINED BENEFIT PLAN (PERS-DBRP) 1945	JUDGES (JRS) 1967	HIGHWAY PATROL OFFICERS' (HPORS) 1945	SHERIFFS' (SRS) 1974	GAME WARDENS' AND PEACE OFFICERS' (GWPORS) 1963	MUNICIPAL POLICE OFFICERS (MPORS) 1974	FIREFIGHTERS' UNIFIED (FURS) 1981
Actuarial value of assets	\$4,094,393,000	\$5,705,235,727	\$101,192,093	\$147,143,742	\$353,904,349	\$190,849,036	\$413,608,005	\$429,094,690
Actuarial Accrued Liability (AAL)	\$6,004,434,000	\$7,730,084,077	\$62,740,689	\$229,821,775	\$436,715,156	\$230,077,307	\$611,055,584	\$548,240,945
Unfunded portion of accrued actuarial liability (UAAL)	\$1,910,042,000	\$2,024,848,350	(\$3,845,1404)	\$82,678,033	\$82,810,807	\$39,228,271	\$197,447,579	\$119,146,255
Funded ratio (rounded)	68%	74%	161%	64%	81%	83%	68%	78%
Amt of contributions as % of payroll available to fund UAAL FY18	9.29%	6.00%	(29.27%)	26.97%	7.44%	3.24%	26.77%	32.47%
Years to amortize unfunded liability	31 years	38 years	0 years	40 years	21 years	72 years	20 years	10 years
ARC shortfall (additional amount required to meet 30-year amortization)	0.04%	0.87%	(37.66%)	3.72%	0%	1.15%	0%	0%
Projected ARC shortfall as rough annual dollar amount	\$332,000	\$10,701,917	(\$2,745,754)	\$567,349	\$0	\$584,466	\$0	\$0

Montana's Public Employees' Retirement Plans: Summary Tables (Source: June 30, 2018, Actuarial Valuation)

**Table 3 - BENEFIT ELIGIBILITY AND BASIC FORMULA**  
(multiplier x highest average compensation x years of service)

	TEACHERS' RETIREMENT SYSTEM (TRS)	PERS DEFINED BENEFIT PLAN (PERS-DB)	JUDGES (JRS)	HIGHWAY PATROL OFFICERS' (HPORS)	SHERIFFS' (SRS)	GAME WARDENS' AND PEACE OFFICERS' (GWPORS)	MUNICIPAL POLICE OFFICERS' (MPORS)	FIREFIGHTERS' UNIFIED (FURS)
Service and age eligibility criteria for full retirement	<p><b>Tier One (pre-7/01/13):</b> 25 yrs, any age or 5 yrs, age 60</p> <p><b>Tier Two (7/01/13)</b> 30 yrs, age 55 or 5 yrs, age 60</p>	<p><b>Pre-7/01/11</b> 30 yrs service, any age or 5 yrs, age 60 or any yrs, age 65</p> <p><b>7/01/11</b> 5 yrs, age 65, or any yrs, age 70</p>	5 years, age 60	20 years, any age	20 years, any age	20 years, age 50 or 5 years, age 55	20 years, any age or 5 years, age 50	20 years, any age or 5 years, age 50
Minimum service for vesting	5 years	5 years	5 years	<p><b>Pre-7/01/13</b> 5 yrs</p> <p><b>7/01/13</b> 10 yrs</p>	5 years	5 years	5 years	5 years
Highest average compensation (HAC) period used in benefit calculation	<p><b>Tier One (pre-7/01/13):</b> 3 years</p> <p><b>Tier Two (7/01/13)</b> 5 years</p>	<p><b>Pre-7/01/11</b> 3 years</p> <p><b>7/01/11</b> 5 years</p>	3 years	3 years	<p><b>Pre-7/01/11</b> 3 years</p> <p><b>7/01/11</b> 5 years</p>	<p><b>Pre-7/01/11</b> 3 years</p> <p><b>7/01/11</b> 5 years</p>	3 years (final avg, not highest avg.)	3 years
Service retirement benefit multiplier	<p><b>Tier One</b> 1.67% per year</p> <p><b>Tier Two (7/01/13)</b> 1.67% per year, then 1.85% per year if attained 30 yrs service and age 60</p>	<p><b>Pre-7/01/11</b> &gt;25 yrs: 1.78571% 25 yrs or more: 2%</p> <p><b>7/01/11</b> &gt;10 yrs: 1.5% 10- 29 yrs: 1.78571% 30 yrs or more: 2%</p> <p><b>Money Purchase Option</b> The greater of the above or actuarial equivalent of 2x member's accumulated contributions plus interest set by board (2.75%)</p>	<p>up to 15 years: 3.33%</p> <p>15 yrs or more: 1.785% for each year more than 15 years</p>	2.6% per year	2.5% per year	2.5% per year	2.5% per year	2.5% per year
Social Security coverage	Yes (most members)	Yes (most members)	Yes	No	Yes	Yes	No	No

Montana's Public Employees' Retirement Plans: Summary Tables  
(Source: June 30, 2018, Actuarial Valuations)

**Table 4 – ACTIVE MEMBERSHIP (Table E-1 in Valuations)**

	TEACHERS' RETIREMENT SYSTEM (TRS) 1937	PERS DEFINED BENEFIT PLAN (PERS-DBRP) 1945	JUDGES (JRS) 1967	HIGHWAY PATROL OFFICERS' (HPORS) 1945	SHERIFFS' (SRS) 1974	GAME WARDENS' AND PEACE OFFICERS' (GWPORS) 1963	MUNICIPAL POLICE OFFICERS (MPORS) 1974	FIREFIGHTERS' UNIFIED (FURS) 1981
Total active contributing members (full- and part-time*)	18,646	28,615	55	220	1,429	1,010	727	691
Average age	45 years	48 years	58 years	40 years	40 years	42 years	39 years	40 years
Average hire age	34 years	38 years	50 years	30 years	32 years	34 years	30 years	30 years
Average years of service	11 years	10 years	9 years	10 years	7 years	8 years	9 years	11 years
Average annual salary (full-time members)	\$54,222	\$51,473	\$137,961	\$65,456	\$54,295	\$50,320	\$66,119	\$69,370
Number of participating employers	365	539	1	1	57	7	33	27
Employers' covered payroll (annual valuation compensation)	\$829,709,000	\$1,230,105,350	\$7,290,904	\$15,251,339	\$77,587,294	\$50,823,150	\$52,035,958	\$47,934,517

\*excludes part-time active members with annual compensation of less than \$1,000

Montana's Public Employees' Retirement Plans: Summary Tables  
 (Source: June 30, 2018, Actuarial Valuations)

**Table 5 – RETIREE AND BENEFIT RECIPIENT DATA (Table E-2 and Appendix D in Valuations)**

	TEACHERS' RETIREMENT SYSTEM (TRS) 1937	PERS DEFINED BENEFIT PLAN (PERS-DBRP) 1945	JUDGES (JRS) 1967	HIGHWAY PATROL OFFICERS' (HPORS) 1945	SHERIFFS' (SRS) 1974	GAME WARDENS' AND PEACE OFFICERS' (GWPORS) 1963	MUNICIPAL POLICE OFFICERS (MPORS) 1974	FIREFIIGHTERS' UNIFIED (FURS) 1981
Number of benefit recipients	15,933	25,555	70	351	681	312	873	652
Average age of current annuitants	72 years	71 years	76 years	68 years	65 years	66 years	66 years	67 years
Average age at retirement	59 years	61 years	65 years	51 years	53 years	56 years	49 years	52 years
Average years of service at retirement	25 years	21 years	17 years	22 years	18 years	17 years	18 years	24 years
Average annual benefit (service retirement)	\$23,096	\$18,570	\$56,202	\$36,657	\$28,339	\$22,265	\$32,179	\$41,441
Percent of income replacement provided under the benefit formula if member attains <u>full</u> service retirement	<b>Tier One (25 yrs)</b> 41.67%	<b>Pre 7/1/11 (30 yrs)</b> 60%	<b>Assuming 15 years</b>	<b>20 years</b>	<b>20 years</b>	<b>20 years</b>	<b>20 years</b>	<b>20 years</b>
	<b>Tier Two (30 yrs &amp; 60+)</b> 55.5%	<b>Post 7/1/11 (30 yrs)</b> 60%	49.95%	52%	50%	50%	50%	50%
Total benefits paid in FY 2018	\$368 million	\$403 million	\$3.7 million	\$12.1 million	\$18.5 million	\$6.8 million	\$27.5 million	\$24.5 million
Benefits paid as percentage of amount invested (fair market value on 6/30/18)	9.2%	7.1%	3.7%	8.1%	5.3%	3.5%	6.6%	5.6%

Montana's Public Employees' Retirement Plans: Summary Tables  
(Source: Montana Code Annotated - 2017)

**Table 6 – POSTRETIREMENT BENEFIT INCREASES**

	TEACHERS' RETIREMENT SYSTEM (TRS) 1937	PERS DEFINED BENEFIT PLAN (PERS-DBRP) 1945	JUDGES (JRS) 1967	HIGHWAY PATROL OFFICERS' (HPORS) 1945	SHERIFFS' (SRS) 1974	GAME WARDENS' AND PEACE OFFICERS' (GWPORS) 1963	MUNICIPAL POLICE OFFICERS (MPORS) 1974	FIREFIIGHTERS' UNIFIED (FURS) 1981
Minimum benefit or Guaranteed Annual Benefit Adjustment (GABA)	GABA <b>Tier One (Pre-7/01/13)</b> 1.5% *  GABA <b>Tier Two (7/01/13)</b> Equal to or greater than 0.5% but no more than 1.50% depending on the funding status of the plan*  GABA <b>Tier Two</b> for calendar 2019 = 0.5%**	GABA <b>Pre-7/01/07</b> 3.0%  <b>7/01/07</b> 1.5%  <b>7/01/13</b> 1.5% reduced 0.1% for every 2 years system is below 90% funded  <b>Post 7/01/13 hires</b> for calendar 2019 = 0.7%	Minimum <b>Pre-7/01/97</b> Benefits increased same as salary of sitting judge  GABA <b>7/01/97 or elected GABA</b> 3.0%	Minimum <b>Pre-7/01/97</b> 2% of base salary of probationary officer  GABA <b>7/01/97 or elected GABA</b> 3.0%  <b>07/01/13</b> 1.5%	GABA <b>Pre-07/01/07</b> 3.0%  <b>07/01/07</b> 1.5%	GABA <b>Pre-07/01/07</b> 3.0%  <b>07/01/07</b> 1.5%	Minimum <b>Pre-7/01/97</b> ½ of monthly salary of new officer  GABA <b>7/01/97 or elected GABA</b> 3.0%	Minimum <b>Pre-7/01/97</b> ½ of monthly salary of new firefighter  GABA <b>7/01/97 or elected GABA</b> 3.0%
Waiting period for GABA	3 years	<b>Pre-7/01/07</b> 1 year	1 year	<b>Pre-7/01/13</b> 1 year  <b>7/01/2013</b> 3 years	1 year	1 year	1 year	1 year

**Note:**

\*The TRS GABA for those hired on or after 7/01/2013 is: If system liabilities are at least 90% funded and the provision of the increase is not projected to cause the system's liabilities to be less than 85% funded, the GABA will be set by the board to an amount that is at least 0.5% but no more than 1.5%. The benefit increase will be effective on January 1.

\*\* This is the actual percentage paid for the calendar year. However, because the Tier Two GABA may be increased to a maximum of 1.5% at some point, the actuaries conduct the valuation of liabilities assuming a 1.5% GABA is paid for all Tier Two members.

Montana's Public Employees' Retirement Plans: Summary Tables  
(Source: Montana Board of Investments)

**Table 7 – INVESTMENT DATA (Sec II, Tables 3 & 4)  
(As of June 30, 2018)**

	TEACHERS' RETIREMENT SYSTEM (TRS) 1937	PERS DEFINED BENEFIT PLAN (PERS-DBRP) 1945	JUDGES (JRS) 1967	HIGHWAY PATROL OFFICERS' (HPORS) 1945	SHERIFFS' (SRS) 1974	GAME WARDENS' AND PEACE OFFICERS' (GWPORS) 1963	MUNICIPAL POLICE OFFICERS (MPORS) 1974	FIREFIGHTERS' UNIFIED (FURS) 1981																												
Amount invested (fair value on 6/30/18)	\$4 billion	\$5.65 billion	\$100 million	\$149 million	\$351 million	\$194 million	\$418 million	\$434 million																												
Market rate of return: FY 2018	8.8%	8.9%	8.9%	8.86%	8.83%	8.81%	8.65%	8.63%																												
Actuarial rate of return: FY 2018 (4-year smoothing)	6.9%	6.7%	6.9%	6.84%	6.92%	7.01%	6.81%	6.84%																												
Avg. market rate of return last 10 years	7.2% (15 yrs)	6.7%	6.7%	6.69%	6.71%	6.66%	6.46%	6.49%																												
Avg. actuarial rate of return last 10 years	6.0% (15 yrs)	5.95%	5.97%	5.93%	6.03%	6.12%	5.81%	5.87%																												
Asset allocation all pension funds	*STIP = 2% **CAPP = 98%  * Short Term Investment Pool **Consolidated Asset Pension Pool ***Treasury Inflation Protected Securities		CAPP Asset Allocation  <table> <tr> <td>Domestic Equity</td> <td>34.6%</td> <td>Investment Grade Credit</td> <td>3.2%</td> </tr> <tr> <td>International Equity</td> <td>17.2%</td> <td>High Yield Bond</td> <td>2.7%</td> </tr> <tr> <td>Private Equity</td> <td>10.5%</td> <td>Natural Resources</td> <td>2.6%</td> </tr> <tr> <td>US Treasury &amp; Agency</td> <td>8.0%</td> <td>Broad Fixed Income</td> <td>1.3%</td> </tr> <tr> <td>Real Estate</td> <td>6.9%</td> <td>Diversifying Strategies</td> <td>0.4%</td> </tr> <tr> <td>Mortgage-Backed</td> <td>3.7%</td> <td>Cash / Cash Equivalents</td> <td>3.6%</td> </tr> <tr> <td>***TIPS</td> <td>3.2%</td> <td></td> <td></td> </tr> </table>						Domestic Equity	34.6%	Investment Grade Credit	3.2%	International Equity	17.2%	High Yield Bond	2.7%	Private Equity	10.5%	Natural Resources	2.6%	US Treasury & Agency	8.0%	Broad Fixed Income	1.3%	Real Estate	6.9%	Diversifying Strategies	0.4%	Mortgage-Backed	3.7%	Cash / Cash Equivalents	3.6%	***TIPS	3.2%		
Domestic Equity	34.6%	Investment Grade Credit	3.2%																																	
International Equity	17.2%	High Yield Bond	2.7%																																	
Private Equity	10.5%	Natural Resources	2.6%																																	
US Treasury & Agency	8.0%	Broad Fixed Income	1.3%																																	
Real Estate	6.9%	Diversifying Strategies	0.4%																																	
Mortgage-Backed	3.7%	Cash / Cash Equivalents	3.6%																																	
***TIPS	3.2%																																			

Montana's Public Employees' Retirement Plans: Summary Tables  
(Source: FY 2018, Actuarial Valuations)

**Table 8 – CASH FLOW**  
(Valuation Summary Table and Tables 2 and 9 and Montana Board of Investments)

Notes on cash flow and cash need: Investment strategy must consider how much of the pension fund's assets need to be kept in more liquid investments to pay benefits as they come due. The more mature a plan becomes (i.e., the more retirees there are compared to current employees), the more cash is needed to cover benefit payments. If a plan has a "negative cash flow", it means that cash flowing out to pay benefits and expenses is greater than income from current contributions and investment returns. **Net cash flow** is reported in the actuarial valuations when looking at the overall financial position of the plan. However, another measurement is **net cash need**, which is a factor used by the Board of Investments to determine investment liquidity needs. **Net cash need** is the amount of contributions coming in minus the amount in benefits and expenses paid out and does not consider net investment income. Net cash need can be divided by the amount invested to determine what percentage of a plan's assets may need to be invested in more liquid investment vehicles to ensure a plan has enough cash on hand to pay benefits as they come due. Net cash flow and net cash need numbers are indicators that help determine the extent to which principle assets may need to be sold to pay for benefits and expenses and whether the earning potential of a portfolio is being reduced because of an increasing need to use more liquid investment vehicles that do not have the same earning potential as longer-term less liquid investments.

	TEACHERS' RETIREMENT SYSTEM (TRS) 1937	PERS DEFINED BENEFIT PLAN (PERS-DBRP) 1945	JUDGES (JRS) 1967	HIGHWAY PATROL OFFICERS' (HPORS) 1945	SHERIFFS' (SRS) 1974	GAME WARDENS' AND PEACE OFFICERS' (GWPORS) 1963	MUNICIPAL POLICE OFFICERS (MPORS) 1974	FIREFIGHTERS' UNIFIED (FURS) 1981
Benefits & Expenses (includes withdrawals)	\$361.2 million	\$415.2 million	\$4.1 million	\$12.1 million	\$20 million	\$8.0 million	\$27.6 million	\$24.4 million
Total contributions	\$214.8 million	\$243.4 million	\$1.7 million	\$8.5 million	\$8.8 million	\$10.1 million	\$28.6 million	\$28.5 million
Net investment income	\$343.7 million	\$478.7 million	\$8.5 million	\$12.3 million	\$29.2 million	\$15.9 million	\$33.2 million	\$34.3 million
Net cash flow	\$197.3 million	\$306.9 million	\$6.1 million	\$8.7 million	\$28 million	\$17.7 million	\$34.2 million	\$38.4 million
Net cash need (contributions minus benefits and expenses)	\$146.4 million	\$171.8 million	\$2.4 million	\$3.6 million	\$11.2 million	Surplus of \$2.1 million	\$1.0 million	\$4.0 million
Net cash need as percentage of assets invested	3.7%	3.0%	2.4%	2.4%	3.2%	1.0%	0.23%	0.92%
Net increase in plan assets	\$197.4 million	\$306.9 million	\$6 million	\$8.7 million	\$28 million	\$17.7 million	\$34.2 million	\$38.4 million
Increase in actuarial accrued liability (AAL) (FY17-18)	\$367.6 million	\$151.7 million	\$4.6 million	\$10.4 million	\$2.5 million	\$12.4 million	\$48.5 million	\$25.9 million

Montana's Public Employees' Retirement Plans: Summary Tables

**Table 8A – EXPENSE DATA**  
(Board of Investments Expenses)

For the fiscal year ended June 30, 2018	TEACHERS' RETIREMENT SYSTEM (TRS) 1937	PERS DEFINED BENEFIT PLAN (PERS-DBRP) 1945	JUDGES (JRS) 1967	HIGHWAY PATROL OFFICERS' (HPORS) 1945	SHERIFFS' (SRS) 1974	GAME WARDENS' AND PEACE OFFICERS' (GWPORS) 1963	MUNICIPAL POLICE OFFICERS (MPORS) 1974	FIREFIGHTERS' UNIFIED (FURS) 1981
Total Assets Under Management 6/30/18	\$4,115,678,789	\$5,764,559,754	\$102,145,680	\$148,037,453	\$357,716,650	\$192,640,094	\$401,573,041	\$416,887,491
BOI Fixed/Internal Costs	\$1,348,136	\$1,880,397	\$33,312	\$48,193	\$115,231	\$61,733	\$130,742	\$135,096
BOI Fixed/Internal Costs as Percentage of Assets	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
BOI Variable/ External Costs TOTAL	\$23,787,555	\$33,193,212	\$588,326	\$850,634	\$2,033,352	\$1,089,684	\$ 2,307,848	\$ 2,384,405
Variable/ External Costs as Percentage of Assets	0.58%	0.58%	0.58%	0.57%	0.57%	0.57%	0.57%	0.56%

Notes:

Each plan has assets allocated to STIP and to CAPP. See Table 7 for general information about asset allocation.

Fixed costs are those associated with internal management by BOI staff.

Variable costs are those associated with management of funds by external entities.

According to CEM Benchmarking, which is an outside consultant to the BOI providing comparisons with other U.S. public funds and peer pension funds, the peer group median cost was 0.676% and the BOI's benchmark cost was 0.593%.

Montana's Public Employees' Retirement Plans: Summary Tables  
(Source: June 30, 2018, Actuarial Valuation)

**Table 9 – VOLUNTEER FIREFIGHTER'S COMPENSATION ACT**  
(Established in 1935)

Eligible fire companies (as defined in 19-17-109, MCA)	235
Members	2,029 active members 1,473 benefit recipients
Minimum age and service requirements	For full benefit: Age 55 and 20 years of service For reduced benefit: Age 60 and 10 years of service
Vesting	10 Years
Basic benefit formula	<ul style="list-style-type: none"> <li>• Age 55 with 20 years of credit for service, or</li> <li>• Age 60 with 10 years of credit for service</li> <li>• \$8.75 per month x year of credit for service up to 20 years</li> <li>• \$7.50 per month x year of credit for service after 20 years</li> <li>• VFCA members retiring prior to July 1, 2011, maximum credited service is 30 years</li> <li>• VFCA members retiring on or after July 1, 2011, \$7.50 per month for each additional year of credited service after 30 years in each year that the trust is actuarially sound and the amortization period is 20 years or less; otherwise benefits for the year will only be paid on credited service up to 30 years</li> </ul>
Disability benefit	The greater of: a. \$87.50 per month, or b. (\$8.75 per month x year of credit for service up to 20 years) + (\$7.50 per month x year of credit for service after 20 years up to 30 years of credit for service)
Survivorship benefit	\$7.50 per year of service (maximum of 40 months including any amounts retiree received).
Average age of active members	46 years of age
Average years of service of active members	9 years of service
Average annual benefit for full service retiree	\$ 2,004
Contributions	State General Fund: amount equal to 5% of insurance premium taxes collected (See Sections 19-17-301 and 50-3-109, MCA)
Actuarial value of assets Market value of assets	\$38,321,273
Actuarial liabilities	\$46,305,640
Unfunded liability	\$7,984,367
Years to amortize unfunded liability	5 years
Funded ratio	83%

Montana's Public Employees' Retirement Plans: Summary Tables  
 (Source: MPERA and Board of Investments)  
**Table 10 – PERS DEFINED CONTRIBUTION (DC) RETIREMENT PLAN**  
**June 30, 2018**

Membership	New hires have 12 months to make a one-time, irrevocable choice between the DB and DC plans – default is DB plan
Contributing members	2,977
Employee Contributions For FY 19	7.9% of salary – all allocated to individual member accounts Reduced to 6.9% when PERS-DB plan amortization period is less than 25 years.
Employer and State GF Contributions for FY 19	8.67% of salary (reduced to 6.9% when PERS-DB amortization period is less than 25 years)  Contributions allocated as follows: -- 8.33 % to member accounts -- 0.04% to an educational fund -- 0.3% to disability trust fund
Total contributions to member accounts	16.23%
Total Amount Invested	\$ 225.6 million
Average Account Balance	\$ 57,447
Investment Choices	20 funds (5 categories) evaluated quarterly. Options range from aggressive to conservative and include mutual funds, bond funds, and target date funds.  <u>Allocations (totals)</u> 7% Stable value fund 2% Bond funds 55% Target date/balanced funds 28% U.S. equity 8% International equity
Vesting	5 years for employer contributions and investment earnings
Benefits	Contributions plus investment earnings, minus administrative expenses; payable at any time after termination, with a possible federal tax penalty for withdrawal before age 59½.
Disability Benefit	A defined disability benefit based on a 1/56 x HAC x years of service formula, same as provided in the PERS-DBRP.
Death/survivorship benefit	Member's account balance
Plan Administration	PERB is the plan's board of trustees Empower Retirement Services is the plan's record keeper

Montana's Public Employees' Retirement Plans: Summary Tables  
 (Source: MPERA and Board of Investments)

**Table 11 – DEFERRED COMPENSATION PLAN (457)  
 FY 2018**

Membership	Voluntary supplemental retirement savings plan available to all employees of the State, Montana University System, and contracting political subdivisions.
Contributing Members	5,534
Employee Contributions	Voluntary, pre-tax deferral or designated ROTH deferral
Employer Contributions	None, unless specified in an employer contract
Total Amount Invested	\$501.6 million
Number of Investment Choices	22 funds (5 categories) evaluated quarterly. Options range from aggressive to conservative and include mutual funds, bond funds, and target date funds.  <u>Allocations (totals)</u> 47% Stable value fund 2% Bond funds 13% Target date/balanced funds 31% U.S. equity 8% International equity
Vesting	Participants are fully vested in their accounts immediately
Benefit Eligibility	Not available to distribute until separation from service, retirement, death, or upon an unforeseeable emergency, while still employed, provided IRS-specified criteria are met.
Benefit Amount	Lump sum or periodic benefit payment, at the option of the participant. Based on individual account balance and plan provisions. IRS permitted rollovers are also possible.
Death/survivorship Benefit	Member's account balance
Plan Administration	PERB is the plan's board of trustees Great-West Retirement Services is the plan's record keeper

**Table 12 – MONTANA UNIVERSITY SYSTEM RETIREMENT PROGRAM (MUS-RP)  
June 30, 2018**

Montana's Public Employees' Retirement Plans: Summary Tables  
(Source: Office of Commissioner of Higher Education and Board of Investments)

Membership	<p>All administrative, scientific, and instructional staff of the University System and classified staff that elected MUS-RP rather than the PERS-DC plan.</p> <p>Contributing (active): 4,483          Non-contributing (inactive, retired, etc): 5,592          Avg. age: 49 yrs          Avg. yrs of membership: 10 yrs</p>								
Retirement eligibility	<p>A plan member may "retire" (i.e., access the MUS-RP account) once the member has terminated from service and completed the break-in-service requirement. There may be federal tax penalties for withdrawal prior to age 59½.</p>								
Benefit	<p>An MUS-RP member's benefit depends on total contributions to the member's individual account, plus investment earnings, minus administrative expenses. The MUS-RP is administered by TIAA (Teachers' Insurance and Annuity Association)</p> <p>Avg. account balance: \$ 71,146</p>								
Death and survivor benefits	<p>The full account value in member's annuity account is payable to the beneficiary. The benefit can be paid in a single sum, as an annuity to the beneficiary for life, or as an annuity for a fixed period of years. The annuity may also be deferred as federal law permits.</p>								
Total Amount Invested	<p>\$716.8 million</p>								
Investment Choices	<p>34 choices (12 target date bands) 6 categories, evaluated quarterly. Options range from aggressive to conservative and include mutual funds, bond funds, annuity investments, and target date funds.</p> <p><u>Allocations (totals)</u>          9% Guaranteed/Money Market          20% Bond funds          38% Target date/balanced funds          24% U.S. equity          6% International equity          3% Other (Real Estate)</p>								
Total MUS-RP payroll covered	<p>\$251.7million (FY 2016 – will have updated number by Nov. 13)</p>								
Contributions to member accounts as a percentage of payroll	<table border="0"> <tr> <td><b>Contract and Professional Staff:</b></td> <td><b>Classified Staff:</b></td> </tr> <tr> <td>Employer: 5.956%</td> <td>Employer: 8.43%</td> </tr> <tr> <td>Employee: 7.044%</td> <td>Employee: 7.90%</td> </tr> <tr> <td>TOTAL: 13.0%</td> <td>TOTAL: 16.33%</td> </tr> </table>	<b>Contract and Professional Staff:</b>	<b>Classified Staff:</b>	Employer: 5.956%	Employer: 8.43%	Employee: 7.044%	Employee: 7.90%	TOTAL: 13.0%	TOTAL: 16.33%
<b>Contract and Professional Staff:</b>	<b>Classified Staff:</b>								
Employer: 5.956%	Employer: 8.43%								
Employee: 7.044%	Employee: 7.90%								
TOTAL: 13.0%	TOTAL: 16.33%								
Supplemental employer contributions to TRS for unfunded liability.	<table border="0"> <tr> <td><b>Contract and Professional Staff:</b></td> <td><b>Classified Staff:</b></td> </tr> <tr> <td>to TRS for unfunded liability: 4.72%</td> <td>to PERS for education: .04%</td> </tr> </table>	<b>Contract and Professional Staff:</b>	<b>Classified Staff:</b>	to TRS for unfunded liability: 4.72%	to PERS for education: .04%				
<b>Contract and Professional Staff:</b>	<b>Classified Staff:</b>								
to TRS for unfunded liability: 4.72%	to PERS for education: .04%								
Increase required in supplemental contribution rate to amortize unfunded liability by 2033 as required under 19-20-621, MCA	<p>7.17% increase needed to the current 4.72% to reach a total supplemental of 11.89%</p> <p><u>Note:</u> As of June 30, 2018, valuation. This increase is needed if the legislature wishes to continue to have the unfunded liability created in TRS when the MUS-RP was established paid by the U-System and not subsidized by the TRS pension fund.</p>								