
Seattle Skyline with Mt. Rainier in the background

II. Actuarial Exhibits

Office of the State Actuary

"Supporting financial security for generations."

Actuarial Certification Letter
Report of the Combined Actuarial Valuation
As of June 30, 2015

August 2016

This report documents the results of an actuarial valuation of the retirement plans defined under Chapters 41.26, 41.32, 41.35, 41.37, 41.40, and 43.43 of the Revised Code of Washington. The primary purpose of this valuation is to determine contribution requirements for the retirement plans for the 2017-2019 biennium based on a June 30, 2015, measurement date, consistent with the prescribed funding policies. This valuation also provides information on the funding progress and developments in the plans over the past year. This valuation report should not be used for other purposes. Please replace this report with a more recent report when available.

Future actuarial measurements may differ significantly from the current measurements presented in this report if plan experience differs from that anticipated by the assumptions or changes occur in the methods, assumptions, plan provisions or applicable law. We have not performed analysis of the potential range of such future measurements for the purposes of this valuation. Please see the risk assessment on our website for stochastic analysis of possible future outcomes.

The valuation results summarized in this report involve calculations that require assumptions about future economic and demographic events. We believe that the assumptions and methods used in the underlying valuation are reasonable and appropriate for the primary purpose stated above. The use of another set of assumptions and methods, however, could also be reasonable and could produce materially different results. Actual results may vary from our expectations.

The assumptions used in this valuation for investment return, inflation, salary growth, and membership growth were prescribed by the Legislature. Please see our latest *Economic Experience Study* report for further information on the economic assumptions. We developed the demographic assumptions used in this valuation during the *2007-2012 Demographic Experience Study*. The Legislature prescribed the actuarial cost and asset valuation methods. In our opinion, all

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methods, assumptions, and calculations are reasonable and are in conformity with generally accepted actuarial principles and standards of practice as of the date of this publication.

The Department of Retirement Systems (DRS) provided us with member and beneficiary data. We checked the data for reasonableness as appropriate based on the purpose of the valuation. The Washington State Investment Board (WSIB) and DRS provided financial and asset information. An audit of the financial and participant data was not performed. We relied on all the information provided as complete and accurate. In our opinion, this information is adequate and substantially complete for purposes of this valuation.

The asset smoothing method adopted during the 2003 Legislative Session (Chapter 11, Laws of 2003, E1) was intended to address the volatility of contribution rates under the aggregate funding method when used in combination with the existing asset allocation policy of WSIB. The combination of the current asset smoothing method with any other funding method or asset allocation policy may not be appropriate. The Legislature may need to revisit the application of the current asset smoothing method with the Plan 1 funding method as the duration of liabilities in those plans becomes shorter.

Under legislation enacted in 2009 (Chapter 561, Laws of 2009), the Unfunded Actuarial Accrued Liability (UAAL) in the Public Employees' Retirement System (PERS) and the Teachers' Retirement System (TRS) Plans 1 must be amortized over a rolling ten-year period, as a level percentage of projected system payroll. The projected payroll includes pay from current members of PERS and TRS Plans 2/3, as well as projected payroll from future new members. For PERS, the projected payroll includes payroll from retirement systems previously covered under PERS. This is a non-standard amortization method since it includes payroll outside the plan. Additionally, the funding method includes minimum contribution rates effective at the beginning of the 2015-17 Biennium. All contributions required under this method are necessary to fully amortize the UAAL in these plans. Failure to make all future required contributions may result in premature plan insolvency.

The Plan 1 funding method for PERS 1 and TRS 1 is also non-standard in its use of the employer normal cost rate from the Plans 2/3 instead of the underlying Plan 1 employer normal cost rate. However, we find this method reasonable and appropriate given the limited remaining future salary in Plan 1 and the relatively

short period for amortizing the UAAL. Furthermore, Plan 1 employee normal cost rates are fixed in statute at 6 percent and the use of the Plan 2/3 employer normal cost for Plan 1 allows the Legislature to charge all employers the same contribution rate regardless of the plan in which employees hold membership (except for LEOFF).

The undersigned, with actuarial credentials, meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. While this report is intended to be complete, we are available to offer extra advice and explanations as needed.

Sincerely,

Matthew M. Smith, FCA, EA, MAAA
State Actuary

Lisa A. Won, ASA, FCA, MAAA
Deputy State Actuary

Contribution Rates

Member and Employer Rate Summary				
	Plan 1		Plan 2/3	
	2015	2014	2015	2014
PERS				
Member*	6.00%	6.00%	7.92%	7.26%
Employer (Normal Cost)	8.03%	7.37%	8.03%	7.37%
Employer (Plan 1 UAAL)	5.22%	5.11%	5.22%	5.11%
Total Employer	13.25%	12.48%	13.25%	12.48%
TRS				
Member*	6.00%	6.00%	7.48%	6.92%
Employer (Normal Cost)	8.25%	7.69%	8.25%	7.69%
Employer (Plan 1 UAAL)	7.60%	7.09%	7.60%	7.09%
Total Employer	15.85%	14.78%	15.85%	14.78%
SERS				
Member*	N/A	N/A	7.80%	6.96%
Employer (Normal Cost)	N/A	N/A	8.80%	7.96%
Employer (PERS Plan 1 UAAL)	N/A	N/A	5.22%	5.11%
Total Employer	N/A	N/A	14.02%	13.07%
PSERS				
Member	N/A	N/A	6.98%	6.81%
Employer (Normal Cost)	N/A	N/A	6.98%	6.81%
Employer (PERS Plan 1 UAAL)	N/A	N/A	5.22%	5.11%
Total Employer	N/A	N/A	12.20%	11.92%
LEOFF				
Member	0.00%	0.00%	7.88%	7.91%
Employer	0.00%	0.00%	4.73%	4.74%
State (Normal Cost)	0.00%	0.00%	3.15%	3.17%
State (Plan 1 UAAL)	0.00%	0.00%	0.00%	0.00%
Total State	0.00%	0.00%	3.15%	3.17%
WSPRS				
Member	7.34%	7.34%	7.34%	7.34%
Employer (State)	14.90%	10.82%	14.90%	10.82%

Note: Employer rates exclude administrative expense rate.
**Plan 3 members do not contribute to the defined benefit plan.*

Development of 2015 Employer/State Rates									
	PERS		TRS		SERS	PSERS	LEOFF		WSPRS
	Plan 1	Plan 2/3	Plan 1	Plan 2/3	Plan 2/3	Plan 2	Plan 1	Plan 2	
a. Total Normal Cost	14.03%	15.95%	14.25%	15.73%	16.60%	13.96%	0.00%	15.76%	22.24%
b. Member Normal Cost*	6.00%	7.92%	6.00%	7.48%	7.80%	6.98%	0.00%	7.88%	7.34%
c. Employer Contribution (a-b)	8.03%	8.03%	8.25%	8.25%	8.80%	6.98%	0.00%	7.88%	14.90%
d. Cost to Amortize UAAL	5.22%	5.22%	7.60%	7.60%	5.22%	5.22%	0.00%	0.00%	N/A
e. Total Employer Rate (c+d)**	**13.25%**	**13.25%**	**15.85%**	**15.85%**	**14.02%**	**12.20%**	**0.00%**	**4.73%**	**14.90%**

Note: Employer rates exclude administrative expense rate.

**Plan 3 members do not contribute to the defined benefit plan.*

***The state pays 20% of the total normal cost for LEOFF 2. This reduces the total employer contribution rate from 7.88% to 4.73%.*

TRS Plan 2 Maximum Member Contribution Rates

Valuation Year	Prior Max	Supplemental	Source	Description	New Max
2010 - 2015	8.63%	0.01%	C 5 L 11	AFC protection against reduced salaries	8.64%
2007 - 2009	8.55%	0.08%	C 101 L 08	Out-of-state service credit purchases	8.63%
2006	7.76%	0.79%	C 491 L 07	Improved Subsidized ERFs for certain Plan 2/3 members	8.55%
2005	7.75%	0.01%	C 33 L 06	Lowered vesting requirements for certain Plan 3 members	7.76%
1999 - 2004	6.59%	1.16%	C 247 L 00	Subsidized ERFs for Plan 2/3 members	7.75%
1997 - 1998	N/A	N/A	N/A		6.59%

Note: Maximum member contribution rates change each year by 50% of benefit improvements, except as stated in RCW 41.45.070.

WSPRS Plan 1/2 Maximum Member Contribution Rates

Valuation Year	Prior Max	Supplemental	Source	Description	New Max
2014 - 2015	7.19%	0.15%	C 78 L 15	L&I duty-related death benefits paid from pension trust fund on remarriage	7.34%
2009 - 2013	7.18%	0.01%	C 261 L 10	Increased duty-related death benefits	7.19%
2008	6.95%	0.23%	C 522 L 09	Survivor benefits for registered domestic partners	7.18%
2006* - 2007	N/A	N/A	N/A		6.95%

Note: Maximum member contribution rates change each year by 50% of benefit improvements, except as stated in RCW 41.45.070.

**The original maximum contribution rate of 7% was decreased by 0.05% for C 87 L 07 (Raised maximum retirement age, 0.14% decrease) and C 488 L 07 (Provided medical premium reimbursements for certain survivors, 0.09% increase).*

The following tables show the development of the normal cost rates. Consistent with current funding policy, the normal cost rates include minimum contribution rates to provide stable and adequate contribution rates over time. The minimum rates are a percent of the normal cost calculated under the Entry Age Normal (EAN) funding method. The percent is 70 percent for WSPRS Plans 1 and 2, 90 percent for LEOFF Plan 2, and 80 percent for all other plans. Please see the Glossary for a more detailed explanation of EAN.

Development of Normal Cost Rates

(Dollars in Millions)		PERS 2/3	TRS 2/3	SERS 2/3	PSERS 2	LEOFF 2	WSPRS
1. Calculation of Member Normal Cost Rate							
a.	Future Value of Fully Projected Benefits	$271,927	$135,350	$33,999	$11,230	$95,769	$7,427
b.	Present Value of Fully Projected Benefits	$39,236	$14,509	$5,411	$780	$12,152	$1,240
c.	Valuation Assets	28,292	9,953	3,901	338	9,320	1,067
d.	Unfunded Fully Projected Benefits (b - c)	10,944	4,556	1,510	442	2,832	173
e.	Past Liability Balance	41	167	41	0	0	9
f.	Adjusted Unfunded (d - e)	$10,903	$4,389	$1,469	$442	$2,832	$164
Present Value of Projected Salaries to Current Members (PVS)							
g.	Plan 1 PVS	N/A	N/A	N/A	N/A	N/A	$303
h.	Plan 2 PVS	60,446	10,812	5,716	3,165	18,977	481
i.	Plan 3 PVS	16,784	37,019	7,391	N/A	N/A	N/A
j.	Weighted PVS (2g + 2h + i)	$137,675	$58,644	$18,823	$6,330	$37,954	$1,569
k.	Employee Normal Cost (f / j)	7.92%	7.48%	7.80%	6.98%	7.46%	10.46%
l.	Employee Minimum Contribution Rate	4.33%	5.13%	4.53%	5.65%	7.88%	6.79%
m.	Prior Year Employee Maximum Contribution Rate*	N/A	8.64%	N/A	N/A	N/A	7.34%
n.	Employee Contribution Rate with Max/Min	7.92%	7.48%	7.80%	6.98%	7.88%	7.34%
o.	Change In Plan Provisions (Laws of 2016)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
p.	Employee Contribution Rate (n + o)**	7.92%	7.48%	7.80%	6.98%	7.88%	7.34%
2. Calculation of Employer Normal Cost Rate							
a.	Present Value of Fully Projected Benefits	$39,236	$14,509	$5,411	$780	$12,152	$1,240
b.	Valuation Assets	28,292	9,953	3,901	338	9,320	1,067
c.	Unfunded Benefits (a - b)	10,944	4,556	1,510	442	2,832	173
d.	Present Value of Employee Contributions	4,787	809	446	221	1,416	82
e.	Past Liability Balance	41	167	41	0	0	9
f.	Employer Responsibility (c - d - e)	$6,116	$3,580	$1,023	$221	$1,416	$82
Present Value of Projected Salaries to Current Members (PVS)							
g.	Plan 1 PVS	N/A	N/A	N/A	N/A	N/A	303
h.	Plan 2 PVS	60,446	10,812	5,716	3,165	18,977	481
i.	Plan 3 PVS	16,784	37,019	7,391	N/A	N/A	N/A
j.	Total PVS (g + h + i)	$77,229	$47,832	$13,107	$3,165	$18,977	$784
k.	Employer Normal Cost (f / j)	7.92%	7.48%	7.80%	6.98%	7.46%	10.46%
l.	Employer Minimum Contribution Rate	4.33%	5.13%	4.53%	5.65%	7.88%	6.79%
m.	Employer Contribution Rate with Minimum	7.92%	7.48%	7.80%	6.98%	7.88%	10.46%
n.	Excess Employer Rate1	N/A	0.00%	N/A	N/A	N/A	3.12%
o.	Rate to Amortize Past Liability Balance***	0.11%	0.77%	1.00%	N/A	N/A	1.32%
p.	Change In Plan Provisions (Laws of 2016)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
q.	Employer Contribution Rate (m + n + o + p)	8.03%	8.25%	8.80%	6.98%	7.88%	14.90%
3. Normal Cost Rates Adopted for 2017-19[4]							
a.	Employee Contribution Rate[5]	7.38%	7.06%	7.27%	6.73%	8.75%	7.34%
b.	Employer Contribution Rate[5]	7.49%	7.83%	8.27%	6.73%	5.25%	12.81%
c.	State Contribution Rate[5]	N/A	N/A	N/A	N/A	3.50%	N/A
d.	Total Contribution Rate (a + b + c)	**14.87%**	**14.89%**	**15.54%**	**13.46%**	**17.50%**	**20.15%**

Note: Totals may not agree due to rounding.

[1] *WSPRS and TRS 2 employees pay 50% of the total normal cost, not to exceed an adjusted cap. The employer pays the excess.*

[2] *Plan 3 members do not contribute to the defined benefit plan.*

[3] *WSPRS liability is attributable to past costs for improved survivor benefits. PERS, TRS, and SERS liability is attributable to past Plan 3 gain-sharing.*

[4] *For all plans except LEOFF Plan 2, the adopted rates include the second step of a three-biennial phase-in of the cost associated with the mortality improvement assumption change from the 2013 AVR. LEOFF 2 rates adopted by LEOFF 2 Board; all others adopted by PFC.*

[5] *LEOFF 2 rate: 50% Employee, 30% Employer, 20% State.*

Amortization of the Plan 1 Unfunded Actuarial Accrued Liability (UAAL)				
(Dollars in Millions)		**PERS 1**	**TRS 1**	**LEOFF 1**
a.	Future Value of Fully Projected Benefits	$29,215	$20,865	$10,633
b.	Present Value of Fully Projected Benefits (PVFB)	$12,655	$9,144	$4,313
c	Valuation Assets	$7,315	$5,870	$5,404
d.	Actuarial Present Value of Future Normal Costs	$103	$40	$0
e.	Balance of Plan 1 Benefit Improvements After 2009	$114	$51	N/A
f.	UAAL (b - c - d - e)	$5,122	$3,183	($1,090)
g.	Expected UAAL Contributions to 2017	N/A	N/A	$0
h.	Remaining UAAL (f - g)	$5,122	$3,183	($1,090)
i.	Amortization Date	N/A	N/A	6/30/2024
j.	Present Value of Projected Salaries*	$100,848	$42,703	$11,025
k.	Contribution Rate Before Adjustments (h / j)	5.08%	7.45%	(9.89%)
l.	Minimum Contribution Rate	3.50%	5.75%	N/A
m.	Preliminary Contribution Rate**	5.08%	7.45%	(9.89%)
n.	Plan 1 Benefit Improvements After 2009	0.14%	0.15%	N/A
o.	Change In Plan Provisions (Laws of 2016)	0.00%	0.00%	0.00%
p.	Contribution Rate to Amortize the UAAL (m + n + o)**	5.22%	7.60%	(9.89%)
Plan 1 UAAL Contribution Rates Adopted by PFC				
	Contribution Rate Adopted for 2017-19***	5.03%	7.19%	0.00%

Note: Totals may not agree due to rounding.

**Measured under the plan's amortization method.*

***No LEOFF 1 UAAL contributions are required when the plan is fully funded under current methods and assumptions.*

****Adopted rates include the second step of a three-biennial phase-in of the cost associated with the mortality improvement assumption change from the 2013 AVR. Adopted TRS 1 UAAL contribution rate includes a change to the Growth in Membership assumption from 0.80% to 1.25%.*

Actuarial Liabilities

Present Value of Fully Projected Benefits

(Dollars in Millions)	PERS			TRS			SERS	PSERS	LEOFF			WSPRS
	Plan 1	Plans 2/3	Total	Plan 1	Plans 2/3	Total	Plans 2/3	Plan 2	Plan 1	Plan 2	Total	
Active Members												
Retirement	$1,178	$25,895	$27,073	$570	$10,547	$11,117	$3,362	$666	$100	$8,500	$8,599	$474
Termination	1	869	870	0	362	362	195	44	0	151	151	3
Death	14	263	277	4	89	93	36	5	1	125	126	5
Disability	1	149	150	0	11	11	15	4	0	391	391	2
ROC* on Termination	0	288	288	0	31	31	31	22	0	95	95	2
ROC* on Death	21	231	252	8	24	32	20	9	0	143	143	2
Total Active	**$1,215**	**$27,694**	**$28,909**	**$582**	**$11,065**	**$11,647**	**$3,659**	**$750**	**$101**	**$9,405**	**$9,506**	**$488**
Inactive Members												
Terminated	$138	$2,726	$2,865	$39	$965	$1,004	$535	$23	$0	$189	$189	$14
Service Retired	10,517	8,370	18,887	8,070	2,411	10,482	1,171	6	1,888	2,289	4,177	676
Disability Retired	115	138	253	83	11	94	16	0	1,729	160	1,889	6
Survivors	670	307	977	371	56	427	30	0	595	108	703	56
Total Inactive	**$11,440**	**$11,542**	**$22,982**	**$8,563**	**$3,444**	**$12,006**	**$1,751**	**$29**	**$4,212**	**$2,747**	**$6,959**	**$752**
Laws of 2016	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
2015 Total	**$12,655**	**$39,236**	**$51,891**	**$9,144**	**$14,511**	**$23,655**	**$5,411**	**$780**	**$4,313**	**$12,152**	**$16,465**	**$1,240**
2014 Total	**$12,833**	**$36,119**	**$48,952**	**$9,297**	**$13,131**	**$22,427**	**$4,881**	**$672**	**$4,332**	**$11,205**	**$15,537**	**$1,184**

Note: Totals may not agree due to rounding.

**Return of Contributions*

Entry Age Normal Accrued Liability*

(Dollars in Millions)	PERS			TRS			SERS	PSERS	LEOFF			WSPRS
	Plan 1	Plans 2/3	Total	Plan 1	Plans 2/3	Total	Plans 2/3	Plan 2	Plan 1	Plan 2	Total	
Active Members												
Retirement	$1,103	$19,919	$21,022	$540	$7,218	$7,759	$2,538	$310	$98	$5,737	$5,835	$336
Termination	(11)	286	275	(4)	104	99	57	15	(0)	32	32	1
Death	12	198	210	3	60	63	26	2	1	46	47	2
Disability	(2)	78	75	(1)	4	4	6	2	(3)	217	214	1
ROC** on Termination	(8)	(172)	(180)	(1)	(11)	(12)	(10)	(5)	0	(28)	(28)	(1)
ROC** on Death	20	157	177	7	11	18	13	3	0	87	88	1
Total Active	**$1,114**	**$20,466**	**$21,579**	**$545**	**$7,386**	**$7,931**	**$2,630**	**$327**	**$95**	**$6,092**	**$6,187**	**$341**
Inactive Members												
Terminated	$138	$2,726	$2,865	$39	$965	$1,004	$535	$23	$0	$189	$189	$14
Service Retired	10,517	8,370	18,887	8,070	2,411	10,482	1,171	6	1,888	2,289	4,177	676
Disability Retired	115	138	253	83	11	94	16	0	1,729	160	1,889	6
Survivors	670	307	977	371	56	427	30	0	595	108	703	56
Total Inactive	**$11,440**	**$11,542**	**$22,982**	**$8,563**	**$3,444**	**$12,006**	**$1,751**	**$29**	**$4,212**	**$2,747**	**$6,959**	**$752**
Laws of 2016	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
2015 Total	**$12,553**	**$32,008**	**$44,561**	**$9,107**	**$10,831**	**$19,939**	**$4,381**	**$357**	**$4,307**	**$8,838**	**$13,146**	**$1,093**
2014 Total	**$12,720**	**$29,321**	**$42,042**	**$9,250**	**$9,819**	**$19,069**	**$3,965**	**$291**	**$4,323**	**$8,069**	**$12,392**	**$1,042**

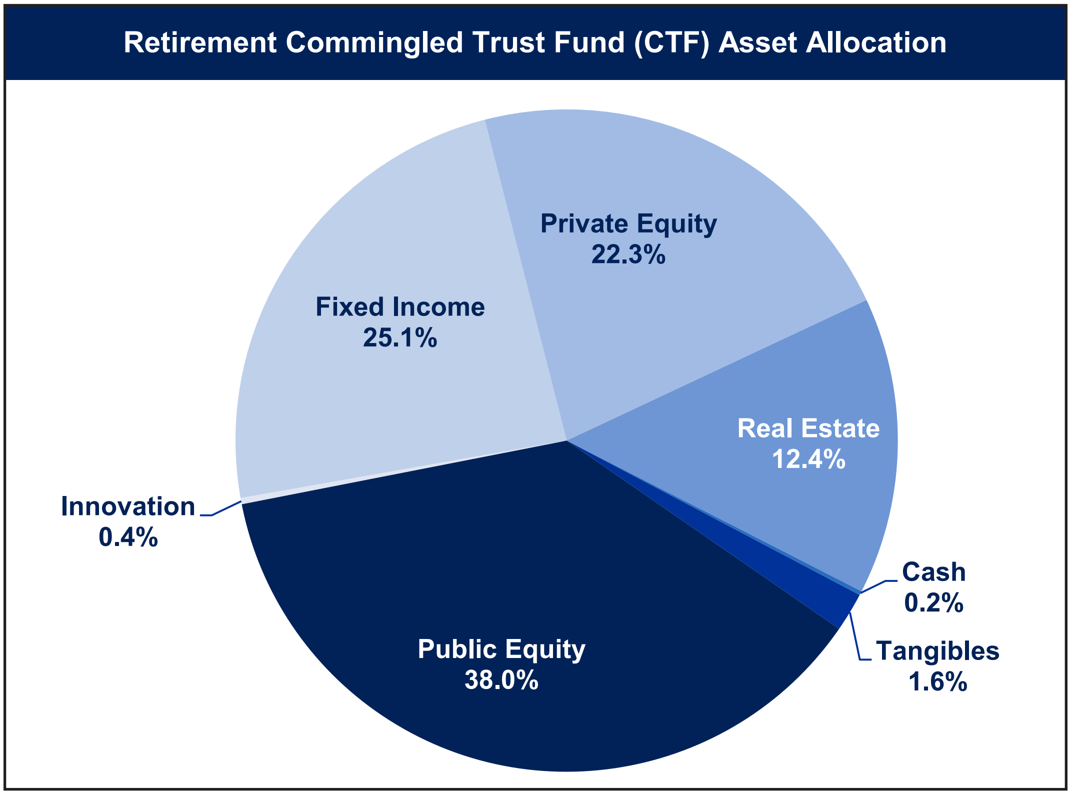
Note: Totals may not agree due to rounding.

**Calculated using the Entry Age Normal (EAN) cost method. This method was not used to determine contribution requirements.*

***Return of Contributions*

In prior reports, we included the projected benefit payments by year and by plan under the statutorily assumed interest rate. We now report these projections on our website along with projections that vary by interest rate assumptions. For more information or to view the projected benefits, please visit our website: **Projected Benefit Payments**.

Plan Assets



Cash: Highly liquid, very safe investments that can be easily converted into cash, such as Treasury Bills and money-market funds.

Fixed Income: Securities representing debt obligations and usually having fixed payments and maturities. Different types of fixed income securities include government and corporate bonds, mortgage-backed securities, asset-backed securities, convertible issues, and may also include money-market instruments.

Innovation: Fund that provides the ability to invest in a broad range of assets that fall outside the traditional asset classes or management style of existing asset classes.

Public Equity: Shares of U.S. and non-U.S. corporations that trade on public exchanges or "over-the-counter." The ownership of a corporation is represented by shares that are claimed on the corporation's earnings and assets.

Private Equity: The infusion of equity capital into a private company (one that is not available on the public markets). Private equity investments include securities that are not listed on a public exchange and are not easily accessible to most individuals. These investments range from initial capital in start-up enterprises to leveraged buyouts of mature corporations.

Real Estate: An externally-managed selection of partnership investments with the majority of the partnerships invested in high-quality real estate leased to third parties.

Tangibles: The tangible asset portfolio invests in sectors such as infrastructure, timber, agriculture, natural resources, commodities, or other sectors consistent with the goals of the asset class.

Change in Market Value of Assets						
(Dollars in Millions)	PERS			TRS		
	Plan 1	Plan 2/3*		Plan 1	Plan 2/3*	
	Fund 631	Fund 641	Total	Fund 632	Fund 642	Total
2014 Market Value	**$7,942**	**$28,099**	**$36,040**	**$6,494**	**$9,790**	**$16,285**
Revenue						
Contributions						
Employee	16	355	371	7	47	54
Employer/State	462	446	908	224	267	491
Total Contributions	478	801	1,279	231	314	545
Investment Return	336	1,295	1,632	270	454	723
Restorations	6	19	25	3	6	9
Transfers In	0	0	0	0	0	0
Miscellaneous	0	(0)	0	0	0	0
Total Revenue	**$820**	**$2,116**	**$2,937**	**$504**	**$773**	**$1,277**
Disbursements						
Monthly Benefits**	$1,199	$665	$1,864	$927	$183	$1,110
Refunds	4	35	40	2	3	4
Total Benefits	1,203	701	1,904	929	186	1,115
Transfers Out	0	2	2	0	1	1
Expenses	0	1	1	0	0	0
Total Disbursements	**$1,203**	**$703**	**$1,907**	**$929**	**$187**	**$1,115**
Payables	$0	$0	$0	$0	$0	$0
2015 Market Value	**$7,558**	**$29,512**	**$37,070**	**$6,070**	**$10,377**	**$16,447**
2015 Actuarial Value	**$7,315**	**$28,292**	**$35,607**	**$5,870**	**$9,953**	**$15,823**
Ratio (AV/MV)	**97%**	**96%**	**96%**	**97%**	**96%**	**96%**

Note: Totals may not agree due to rounding.

**Defined Benefit portion only.*

***TRS Plan 1 value includes annuity cashouts.*

Change in Market Value of Assets (Continued)							
(Dollars in Millions)	**SERS**	**PSERS**		**LEOFF**		**WSPRS**	**Total**
	Plan 2/3*	**Plan 2**	**Plan 1**	**Plan 2**			
	Fund 633	**Fund 635**	**Fund 819**	**Fund 829**	**Total**	**Fund 615**	
2014 Market Value	**$3,856**	**$303**	**$5,719**	**$9,251**	**$14,970**	**$1,098**	**$72,553**
Revenue							
Contributions							
Employee	35	19	0	147	147	6	631
Employer/State	97	19	0	147	148	7	1,669
Total Contributions	132	37	0	294	294	12	2,301
Investment Return	178	15	249	430	679	49	3,276
Restorations	1	0	1	19	20	1	56
Transfers In	0	0	0	0	0	0	1
Miscellaneous	0	0	0	0	0	0	0
Total Revenue	**$311**	**$52**	**$250**	**$744**	**$994**	**$62**	**$5,633**
Disbursements							
Monthly Benefits	96	0	358	151	510	50	3,631
Refunds	3	3	0	9	9	0	59
Total Benefits	99	3	359	160	519	50	3,690
Transfers Out	1	0	0	0	0	0	3
Expenses	0	0	0	2	2	0	3
Total Disbursements	**$100**	**$3**	**$359**	**$162**	**$521**	**$50**	**$3,695**
Payables	$0	$0	$0	$0	$0	$0	$0
2015 Market Value	**$4,067**	**$353**	**$5,610**	**$9,833**	**$15,443**	**$1,111**	**$74,490**
2015 Actuarial Value	**$3,901**	**$338**	**$5,404**	**$9,320**	**$14,724**	**$1,067**	**$71,460**
Ratio (AV/MV)	**96%**	**96%**	**96%**	**95%**	**95%**	**96%**	**96%**

Note: Totals may not agree due to rounding.

**Defined Benefit portion only.*

Calculation of Actuarial Value of Assets

(Dollars in Millions)				PERS 1	PERS 2/3[1]	TRS 1	TRS 2/3[1]	SERS 2/3[1]
a.	Market Value at 6/30/2015			$7,558	$29,512	$6,070	$10,377	$4,067
b.	Deferred Gains and (Losses)							
	Plan Year Ending	Years Deferred	Years Remaining					
	6/30/2015	4	3	($191)	($669)	($157)	($232)	($91)
	6/30/2014	8	6	574	1,958	472	679	268
	6/30/2013	5	2	126	368	105	126	50
	6/30/2012	7	3	(225)	(561)	(189)	(191)	(77)
	6/30/2011	8	3	358	810	300	275	111
	6/30/2010	6	0	0	0	0	0	0
	6/30/2009	8	1	(399)	(686)	(333)	(233)	(95)
	Total Deferral			$243	$1,220	$199	$424	$167
c.	Market Value less Deferral (a-b)			$7,315	$28,292	$5,870	$9,953	$3,901
d.	70% of Market Value of Assets			$5,291	$20,658	$4,249	$7,264	$2,847
e.	130% of Market Value of Assets			$9,826	$38,366	$7,890	$13,490	$5,287
f.	**Actuarial Value of Assets[2]**			**$7,315**	**$28,292**	**$5,870**	**$9,953**	**$3,901**

Note: Totals may not agree due to rounding.

[1] Defined Benefit portion only.

[2] Actuarial Value of Assets can never be less than 70% or greater than 130% of the market value of assets.

Calculation of Actuarial Value of Assets
(Continued)

(Dollars in Millions)				PSERS 2	LEOFF 1	LEOFF 2[1]	WSPRS	Total
a.	Market Value at 6/30/2015			$353	$5,610	$9,818	$1,111	$74,476
b.	Deferred Gains and (Losses)							
	Plan Year Ending	Years Deferred	Years Remaining					
	6/30/2015	4,3[2]	3,2[2]	($7)	($137)	($177)	($26)	($1,687)
	6/30/2014	8	6	20	410	658	78	5,117
	6/30/2013	5	2	3	85	129	15	1,008
	6/30/2012	7	3	(4)	(143)	(167)	(25)	(1,582)
	6/30/2011	8	3	5	220	262	37	2,377
	6/30/2010	3, 5, 6[3]	0[3]	0	0	0	0	0
	6/30/2009	8	1	(2)	(228)	(207)	(35)	(2,218)
	Total Deferral			$15	$207	$498	$44	$3,016
c.	Market Value less Deferral (a-b)			$338	$5,404	$9,320	$1,067	$71,460
d.	70% of Market Value of Assets			$247	$3,927	$6,873	$777	$52,133
e.	130% of Market Value of Assets			$459	$7,293	$12,763	$1,444	$96,818
f.	**Actuarial Value of Assets[4]**			**$338**	**$5,404**	**$9,320**	**$1,067**	**$71,460**

Note: Totals may not agree due to rounding

[1] LEOFF Plan 2 Market Value of Assets reduced by a $15.799 million payable to the LEOFF 2 Benefit Improvement Account due by 6/30/2016, discounted to 6/30/2015 at 7.5% (C 4 L 15).

[2] LEOFF Plan 2 = 3 years deferred, 2 years remaining; all other plans = 4 years deferred, 3 years remaining.

[3] PSERS Plan 2 = 3 years deferred, 0 year remaining; LEOFF Plan 2 = 5 years deferred, 0 years remaining; all other plans = 6 years deferred, 0 years remaining.

[4] Actuarial Value of Assets can never be less than 70% or greater than 130% of the market value of assets.

Investment Gains and (Losses) for Prior Year						
(Dollars in Millions)		PERS 1	PERS 2/3*	TRS 1	TRS 2/3*	SERS 2/3*
a.	2014 Market Value (at WSIB)	$7,941	$28,037	$6,495	$9,749	$3,838
b.	Total Cash Flow	(721)	117	(695)	134	34
c.	2015 Market Value (at WSIB)	7,558	29,454	6,071	10,339	4,051
d.	Actual Return (c - b - a)	$338	$1,300	$271	$456	$179
e.	Weighted Asset Amount	$7,587	$28,101	$6,147	$9,816	$3,855
f.	Expected Return (7.8% x e)	592	2,192	479	766	301
g.	Investment Gain/(Loss) for Prior Year (d - f)	(254)	(892)	(209)	(309)	(122)
h.	Dollar-Weighted Rate of Return	4.45%	4.63%	4.41%	4.65%	4.64%

Note: Totals may not agree due to rounding.
**Defined Benefit portion only.*

Investment Gains and (Losses) for Prior Year (Continued)						
(Dollars in Millions)		PSERS 2	LEOFF 1	LEOFF 2	WSPRS	Total
a.	2014 Market Value (at WSIB)	$301	$5,718	$9,226	$1,098	$72,400
b.	Total Cash Flow	34	(358)	146	(37)	(1,346)
c.	2015 Market Value (at WSIB)	350	5,609	9,804	1,110	74,344
d.	Actual Return (c - b - a)	$15	$250	$431	$49	$3,289
e.	Weighted Asset Amount	$317	$5,542	$9,299	$1,080	$71,744
f.	Expected Return (7.8% x e)*	25	432	697	84	5,568
g.	Investment Gain/(Loss) for Prior Year (d - f)	(10)	(183)	(266)	(35)	(2,279)
h.	Dollar-Weighted Rate of Return	4.76%	4.51%	4.64%	4.56%	4.58%

Note: Totals may not agree due to rounding.
**The expected return for LEOFF 2 is (7.5% x e).*

Funded Status

In our actuarial valuation report, we calculate a plan's funded status by comparing (a) the plan's current assets, determined under an asset valuation method, to (b) the actuarial accrued liability of its members calculated under an actuarial cost method. Funded status can vary significantly from plan to plan, depending on the purpose of the measurement and the assumptions and methods used to determine the funded status.

Based on the purpose of the measurement, actuaries can select from several acceptable actuarial cost methods when measuring a plan's funded status. The cost methods vary in the manner they allocate benefits to past and future time periods. Generally speaking, benefits allocated to past service are considered accrued (or earned). Please see the **Glossary** for an explanation of the actuarial cost methods we use in this actuarial valuation.

For actuarial valuation reports prior to 2014, we relied on the Projected Unit Credit (PUC) actuarial cost method when reporting funded status. Due to changes in financial reporting from the Governmental Accounting Standards Board (GASB), we now report funded status using the Entry Age Normal (EAN) actuarial cost method only and discontinued use of the PUC method. We believe this change will lessen the confusion that can result from the reporting of multiple funded status measurements in various reports. However, the funded status measures we share in this report may still vary from those presented in the Department of Retirement Systems (DRS) Comprehensive Annual Financial Report (CAFR). These differences occur because the assumptions and methods that apply for determining contribution requirements (under a funding valuation) may not apply for financial reporting under GASB accounting standards (an accounting valuation). Put another way, these measurements still represent distinct measurements for distinct purposes and the results may vary between the two reports.

To determine the present value (today's value) of accrued benefits we discount future benefits to the valuation date using the valuation interest rate. The valuation interest rate is prescribed by the Legislature under RCW 41.45.035 and is consistent with the long-term expected return under the plan's funding policy. (Note: This discount rate may vary from the rate used for financial reporting under GASB accounting standards).

In addition to the valuation interest rate, we use the same long-term assumptions to develop the funded status measure in this report as we use for determining the contribution requirements of the plan. We don't expect the assumptions to match actual experience over short-term periods. However, we do expect these assumptions to reasonably approximate average annual experience over long-term periods. This measure of funded status is consistent with the state's current funding policy and financing plan for future retirement benefits.

For reporting funding status and calculating contribution requirements, we also use an asset valuation method to determine the Actuarial Value of Assets (AVA). This asset valuation method smooths the inherent volatility in the Market Value of Assets (MVA) by deferring a portion of annual investment gains or losses for a certain number of years. Investment gains and losses occur when the annual return on investments varies from the long-term assumed rate. To determine the 2015 investment gains or losses, we used an investment return assumption of 7.8 percent (7.5 percent for the Law Enforcement Officers' and Fire Fighters' Retirement System [LEOFF] Plan 2). The AVA provides a more stable measure of the plan's assets on an ongoing basis.

With this background in mind, we display the funded status on an "actuarial value" basis for each plan in the table below. For the actuarial value basis, we use the assumed long-term rate of return and actuarial value of assets consistent with the plan's funding policy.

It's also reasonable and acceptable to report funded status using other assumptions and methods. The resulting funded status will change with the use of assumptions and methods that vary from what we present in this report. Please visit our website: Funded Status Tables for funded status measures that vary by interest rate assumptions and asset valuation methods.

Funded Status on an Actuarial Value Basis*

(Dollars in Millions)	PERS		TRS		SERS	PSERS	LEOFF		WSPRS	Total
	Plan 1	Plan 2/3	Plan 1	Plan 2/3	Plan 2/3	Plan 2	Plan 1	Plan 2		
Accrued Liability	$12,553	$32,008	$9,107	$10,831	$4,381	$357	$4,307	$8,838	$1,093	$83,477
Valuation Assets	$7,315	$28,292	$5,870	$9,953	$3,901	$338	$5,404	$9,320	$1,067	$71,460
Unfunded Liability	$5,239	$3,715	$3,237	$879	$481	$19	($1,097)	($482)	$26	$12,017
Funded Ratio										
2015	**58%**	**88%**	**64%**	**92%**	**89%**	**95%**	**125%**	**105%**	**98%**	**86%**
2014	61%	90%	69%	94%	91%	96%	127%	107%	100%	87%

Note: Totals may not agree due to rounding.

**Liabilities valued using the EAN cost method at an interest rate of 7.7% (7.5% for LEOFF 2). All assets have been valued under the actuarial asset method.*

Generally speaking, under current funding policy, when a plan is less/more than 100 percent funded, we expect higher/lower contribution requirements in the near term to return the plan to a 100 percent funded status over time. A plan with a funded status above 100 percent will require future contributions if the plan has not yet accumulated sufficient assets to pay both the expected cost of benefits that have been earned today and the expected cost of benefits that will be earned by current members in the future. As of this valuation date, and under the data, assumptions and methods used for this actuarial valuation, only LEOFF Plan 1 has sufficient assets to cease ongoing contributions.

The funded status measures presented in this report are not sufficient to determine whether a plan has enough assets to terminate or settle the plan obligations.

Actuarial Gains/Losses

The next three tables display actuarial gains and losses, expressed as contribution rate changes. Actuaries use gain/loss analysis to compare actual changes to assumed changes in assets, liabilities, and salaries from various sources. We also use this analysis to determine:

- The accuracy of our valuation model and annual processing.
- Why contribution rates changed.
- The reasonableness of the actuarial assumptions.

Actuarial gains will reduce contribution rates; actuarial losses will increase contribution rates. Under a reasonable set of actuarial assumptions, actuarial gains and losses will offset over long-term experience periods.

Change in Employer and State Contribution Rate by Source

Change in Employer Rate	PERS	TRS	SERS*	PSERS*	LEOFF**	WSPRS
2014 Contribution Rate Before Laws of 2015	**12.48%**	**14.78%**	**13.07%**	**11.92%**	**(8.31%)**	**10.67%**
Remove Rate Floor / Ceiling	0.00%	0.00%	0.00%	0.00%	(0.33%)	0.00%
Remove Plan 1 Benefit Improvements After 2009	(0.14%)	(0.15%)	(0.14%)	(0.14%)	N/A	N/A
Remove Prior Liability and Fixed Amortization Date Adjustment	(0.11%)	(0.77%)	(1.00%)	0.00%	0.29%	(2.40%)
2014 Adjusted Contribution Rate	**12.23%**	**13.86%**	**11.93%**	**11.78%**	**(8.35%)**	**8.27%**
Liability Gains/Losses	0.30%	0.49%	0.94%	0.69%	0.09%	(0.17%)
Asset Gains/Losses	0.94%	1.44%	0.59%	(0.01%)	1.44%	1.55%
Present Value of Future Salaries Gains/Losses	(0.94%)	(1.40%)	(1.08%)	(0.72%)	(0.23%)	(0.36%)
Incremental Changes	0.55%	0.61%	0.51%	0.26%	0.43%	1.27%
Other Gains/Losses	(0.08%)	(0.07%)	(0.01%)	0.06%	(0.29%)	(0.10%)
Total Change	**0.77%**	**1.07%**	**0.95%**	**0.28%**	**1.44%**	**2.19%**
2015 Preliminary Contribution Rate	**13.00%**	**14.93%**	**12.88%**	**12.06%**	**(6.91%)**	**10.46%**
Increase from Applied Rate Floor	0.00%	0.00%	0.00%	0.00%	0.17%	0.00%
Decrease from Applied Rate Ceiling	0.00%	0.00%	0.00%	0.00%	0.00%	N/A
Increase from Plan 1 Benefit Improvements After 2009	0.14%	0.15%	0.14%	0.14%	N/A	N/A
Rate to Amortize Prior Liability	0.11%	0.77%	1.00%	0.00%	0.00%	1.32%
Excess Member Rate	N/A	0.00%	N/A	N/A	N/A	3.12%
Laws of 2016	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2015 Adjusted Contribution Rate	**13.25%**	**15.85%**	**14.02%**	**12.20%**	**(6.74%)**	**14.90%**

**The SERS and PSERS rates include the UAAL rate for PERS Plan 1. The "Other Gains/Losses" category includes the "Total Change" for the PERS 1 UAAL rate in those systems.*

***The LEOFF contribution rate is the state's portion for Plan 2 (20% of the Normal Cost) plus the UAAL rate for Plan 1.*

Change in Employer and State Plan 2/3 Normal Cost Rate by Source						
Change in Normal Costs	**PERS**	**TRS**	**SERS**	**PSERS**	**LEOFF***	**WSPRS****
2014 Normal Cost Before Laws of 2015	**7.37%**	**7.69%**	**7.96%**	**6.81%**	**3.13%**	**10.67%**
Remove Rate Floor / Ceiling	0.00%	0.00%	0.00%	0.00%	(0.33%)	0.00%
Remove Prior Employer Liability	(0.11%)	(0.77%)	(1.00%)	0.00%	0.00%	(2.40%)
2014 Adjusted Normal Cost Rate	**7.26%**	**6.92%**	**6.96%**	**6.81%**	**2.80%**	**8.27%**
Liabilities						
Salaries	(0.26%)	(0.44%)	0.04%	(0.09%)	0.00%	(0.48%)
Termination	(0.15%)	(0.38%)	(0.19%)	(0.17%)	(0.01%)	(0.38%)
Retirement	0.03%	0.04%	0.05%	0.00%	0.00%	(0.37%)
Disability	0.01%	0.00%	0.01%	0.01%	0.00%	0.02%
Mortality	0.02%	0.04%	0.04%	0.02%	0.01%	(0.01%)
Growth / Return to Work	0.55%	1.19%	0.93%	0.93%	0.27%	0.90%
Other Liabilities	0.08%	0.04%	0.06%	(0.01%)	0.03%	0.15%
Total Liability Gains/Losses	**0.28%**	**0.49%**	**0.94%**	**0.69%**	**0.30%**	**(0.17%)**
Asset Gains/Losses	**0.46%**	**0.38%**	**0.59%**	**(0.01%)**	**0.05%**	**1.55%**
Present Value of Future Salaries Gains/Losses	**(0.51%)**	**(0.72%)**	**(1.08%)**	**(0.72%)**	**(0.20%)**	**(0.36%)**
Incremental Changes						
Plan Change	0.00%	0.00%	0.00%	0.00%	0.05%	0.15%
Method Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Assumption Change	0.49%	0.48%	0.51%	0.26%	0.00%	1.12%
Correction Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Experience Study Change	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Incremental Changes Gains/Losses	**0.49%**	**0.48%**	**0.51%**	**0.26%**	**0.05%**	**1.27%**
Other Gains/Losses	(0.06%)	(0.07%)	(0.12%)	(0.05%)	(0.02%)	(0.10%)
Total Change	**0.66%**	**0.56%**	**0.84%**	**0.17%**	**0.18%**	**2.19%**
2015 Preliminary Normal Cost	**7.92%**	**7.48%**	**7.80%**	**6.98%**	**2.98%**	**10.46%**
Increase from Applied Rate Floor	0.00%	0.00%	0.00%	0.00%	0.17%	0.00%
Rate to Amortize Prior Employer Liability	0.11%	0.77%	1.00%	0.00%	0.00%	1.32%
Excess Member Rate	N/A	0.00%	N/A	N/A	N/A	3.12%
Laws of 2016	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2015 Adjusted Normal Cost	**8.03%**	**8.25%**	**8.80%**	**6.98%**	**3.15%**	**14.90%**

**The LEOFF contribution rate is the state's portion only (20% of the Plan 2 Normal Cost).*
***The WSPRS normal cost contribution rate applies to Plans 1 and 2.*

Change in Employer and State Plan 1 UAAL Rate by Source						
Change in UAAL Rate	**PERS**	**TRS**	**SERS***	**PSERS***	**LEOFF****	**WSPRS**
2014 UAAL Rate Before Laws of 2015	**5.11%**	**7.09%**	**5.11%**	**5.11%**	**(11.44%)**	**N/A**
Remove Rate Floor / Ceiling	0.00%	0.00%	0.00%	0.00%	0.00%	N/A
After 2009	(0.14%)	(0.15%)	(0.14%)	(0.14%)	N/A	N/A
Fixed Amortization Date Adjustment	N/A	N/A	N/A	N/A	0.29%	N/A
2014 Adjusted UAAL Rate	**4.97%**	**6.94%**	**4.97%**	**4.97%**	**(11.15%)**	**N/A**
Liabilities						
Salaries	(0.01%)	(0.03%)	N/A	N/A	(0.01%)	N/A
Termination	0.00%	0.00%	N/A	N/A	0.00%	N/A
Retirement	(0.01%)	0.00%	N/A	N/A	0.02%	N/A
Disability	0.00%	0.00%	N/A	N/A	0.00%	N/A
Mortality	(0.01%)	0.02%	N/A	N/A	0.02%	N/A
Return to Work	0.00%	0.00%	N/A	N/A	0.00%	N/A
Inflation (CPI)	0.00%	0.00%	N/A	N/A	(0.40%)	N/A
Other Liabilities	0.05%	0.01%	N/A	N/A	0.16%	N/A
Total Liability Gains/Losses	**0.02%**	**0.00%**	**N/A**	**N/A**	**(0.21%)**	**N/A**
Asset Gains/Losses	**0.48%**	**1.06%**	**N/A**	**N/A**	**1.39%**	**N/A**
Gains/Losses	**(0.43%)**	**(0.68%)**	**N/A**	**N/A**	**(0.03%)**	**N/A**
Incremental Changes						
Plan Change	0.00%	0.00%	N/A	N/A	0.00%	N/A
Method Change	(0.02%)	(0.02%)	N/A	N/A	0.00%	N/A
Assumption Change	0.08%	0.15%	N/A	N/A	0.38%	N/A
Correction Change	0.00%	0.00%	N/A	N/A	0.00%	N/A
Experience Study Change	0.00%	0.00%	N/A	N/A	0.00%	N/A
Gains/Losses	**0.06%**	**0.13%**	**N/A**	**N/A**	**0.38%**	**N/A**
Other Gains/Losses	(0.02%)	(0.00%)	N/A	N/A	(0.27%)	N/A
Total Change	**0.11%**	**0.51%**	**0.11%**	**0.11%**	**1.26%**	**N/A**
2015 Preliminary UAAL Rate	**5.08%**	**7.45%**	**5.08%**	**5.08%**	**(9.89%)**	**N/A**
Increase from Applied Rate Floor	0.00%	0.00%	0.00%	0.00%	N/A	N/A
Decrease from Applied Rate Ceiling	0.00%	0.00%	0.00%	0.00%	0.00%	N/A
Improvements After 2009	0.14%	0.15%	0.14%	0.14%	N/A	N/A
Laws of 2016	0.00%	0.00%	0.00%	0.00%	0.00%	N/A
2015 Adjusted UAAL Rate	**5.22%**	**7.60%**	**5.22%**	**5.22%**	**(9.89%)**	**N/A**

**The SERS and PSERS rates are to fund the PERS Plan 1 UAAL.*

***The LEOFF contribution rate is the UAAL rate for plan 1. The plan has a surplus of assets over liabilities, so no rate is currently payable.*