Washington State
2016 Actuarial Valuation

August • 2017

Office of the State Actuary

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Mailing Address

Office of the State Actuary
PO Box 40914
Olympia, Washington 98504-0914

Physical Address

2100 Evergreen Park Dr. SW
Suite 150

Phone

Reception: 360.786.6140
TDD: 711
Fax: 360.586.8135

Electronic Contact

state.actuary@leg.wa.gov
leg.wa.gov/osa

Report Preparation

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

Sarah Baker

Kelly Burkhart

Mitch DeCamp

Graham Dyer

Aaron Gutierrez, MPA, JD

Beth Halverson

Michael Harbour, ASA, MAAA

Lisa Hawbaker

Luke Masselink, ASA, EA, MAAA

Corban Nemeth

Darren Painter

Stephanie Roman, MA, JD

Frank Serra

Christi Steele

Kyle Stineman, ASA

Keri Wallis

Lisa Won, ASA, FCA, MAAA

Additional Assistance

Department of Retirement Systems

Washington State Investment Board

Legislative Support Services

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Letter of Introduction
Report of the Combined Actuarial Valuation
As of June 30, 2016

August 2017

As required under Chapter 41.45 RCW, this report documents the results of an actuarial valuation of the following Washington State retirement systems.

- ❖ Public Employees' Retirement System.
- ❖ Teachers' Retirement System.
- ❖ School Employees' Retirement System.
- ❖ Public Safety Employees' Retirement System.
- ❖ Law Enforcement Officers' and Fire Fighters' Retirement System.
- ❖ Washington State Patrol Retirement System.

The primary purpose of this valuation is to determine contribution requirements for the systems listed above based on a June 30, 2016, measurement date and under the funding policy established by the Legislature. These contribution requirements are purely informational since, according to state law, this "off-cycle" valuation is not used to determine contribution rates. This valuation also provides information on the funding progress and developments in the plans over the past year.

This report is organized in the following four sections.

- ❖ Summary of Key Results.
- ❖ Actuarial Exhibits.
- ❖ Participant Data.
- ❖ Appendices.

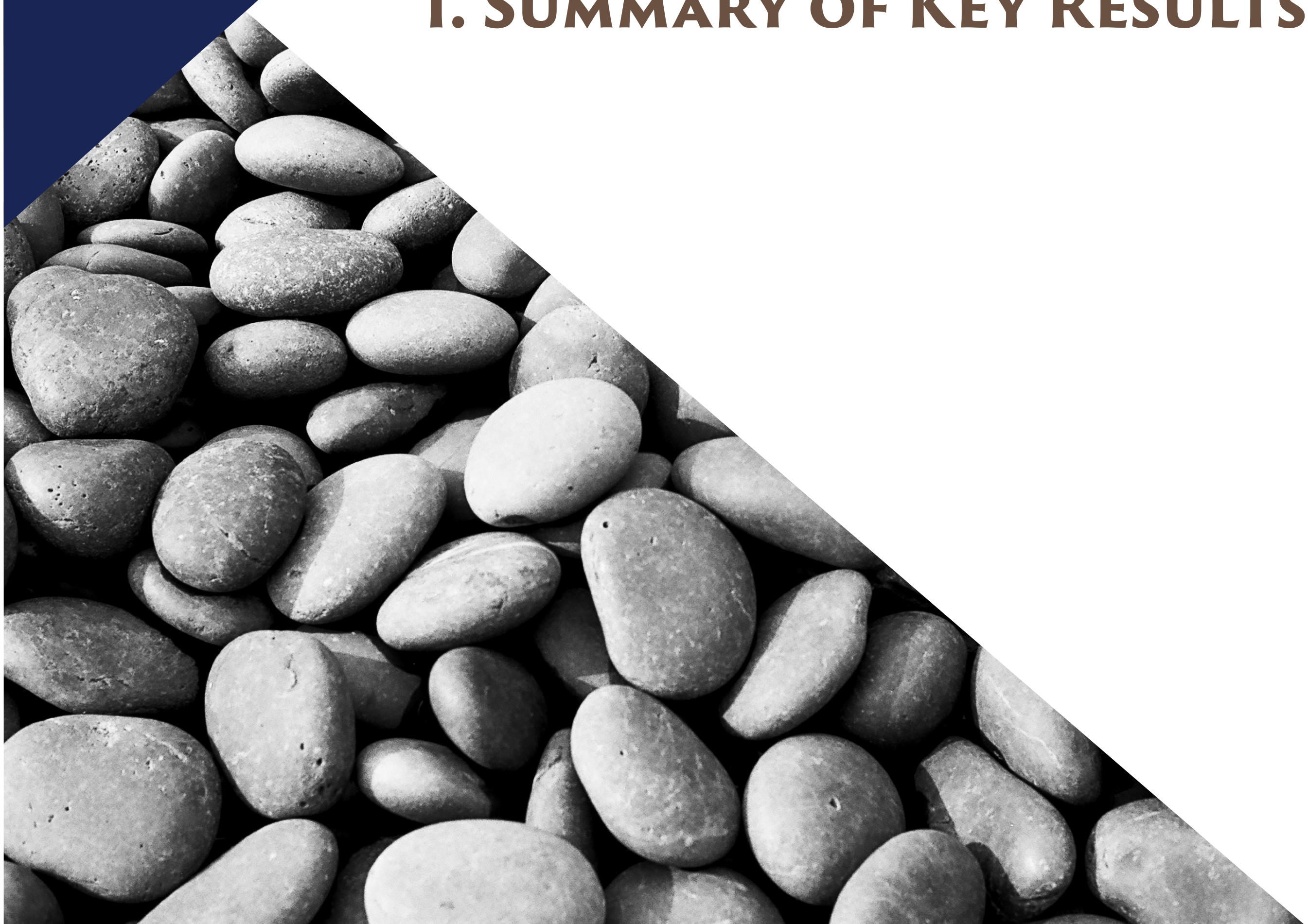
The **Summary of Key Results** section provides a high-level summary of the valuation results for all systems combined. The next two sections of the report provide detailed actuarial asset and liability information and participant data for each system and plan separately. The **Appendices** provide access to a summary of the principal actuarial assumptions and methods, a summary of the major plan provisions, and additional information used to prepare this valuation.

PO Box 40914 | Olympia, Washington 98504-0914 | state.actuary@leg.wa.gov | leg.wa.gov/osa
Phone: 360.786.6140 | Fax: 360.586.8135 | TDD: 711

We encourage you to submit any questions you might have concerning this report to our mailing address or our e-mail address at state.actuary@leg.wa.gov. We also invite you to visit our website (leg.wa.gov/osa), for further information regarding the actuarial funding of the Washington State retirement systems.

Matthew M. Smith, FCA, EA, MAAA	Lisa A. Won, ASA, FCA, MAAA
State Actuary	Deputy State Actuary

I. Summary of Key Results



Intended Use

The purpose of this report is to develop contribution rates required to fund the Washington State retirement systems based on a June 30, 2016, measurement date and based on the funding policy described in this section. This report provides information on the contribution rates, funding progress, and developments in the plans over the past year. This report also discloses the data, assumptions, and methods we used to develop the contribution rates. This report is not intended to satisfy the accounting requirements under the Governmental Accounting Standards Board (GASB) rules.

Similarly, this actuarial valuation is not intended to report on the overall health or financial condition of the pension system. Such information can be found in the 2017 Report on Financial Condition (RFC), which the Office of the State Actuary (OSA) issues every two years. The key measures we use in the RFC to assess the health of a pension plan include funding level, adequacy and affordability of contributions, and risk. Please visit the **Studies and Presentations** page on our website to view the RFC or find more information.

Contribution Rates

We determine the member and employer contribution rates as a percentage of salary. The summary table below shows contribution rates based on the 2016 valuation along with rates from the previous valuation. The **Actuarial Exhibits** section of this report shows how we developed these rates.

Contribution Rates				
	Plan 1		Plan 2/3	
	2016	2015	2016	2015
PERS				
Member*	6.00%	6.00%	8.34%	7.92%
Total Employer	13.50%	13.25%	13.50%	13.25%
TRS				
Member*	6.00%	6.00%	7.98%	7.48%
Total Employer	16.18%	15.85%	16.18%	15.85%
SERS				
Member*	N/A	N/A	8.46%	7.80%
Total Employer	N/A	N/A	14.51%	14.02%
PSERS				
Member	N/A	N/A	6.98%	6.98%
Total Employer	N/A	N/A	12.03%	12.20%
LEOFF				
Member	0.00%	0.00%	7.91%	7.88%
Employer	0.00%	0.00%	4.75%	4.73%
State	0.00%	0.00%	3.16%	3.15%
WSPRS				
Member	7.68%	7.34%	7.68%	7.34%
Employer (State)	24.86%	14.90%	24.86%	14.90%

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

No member or employer/state contributions are required for the Law Enforcement Officers' and Fire Fighters' Retirement System (LEOFF) Plan 1 when the plan remains fully funded. See **RCW 41.26.080(2)**.

Minimum employer contribution rates adopted by the Legislature for the Public Employees' Retirement System (PERS) Plan 1 and the Teachers' Retirement System (TRS) Plan 1 became effective at the beginning of the 2015-17 Biennium. Employer contribution rates for PERS 1 and TRS 1 in the table to the left remain above the minimums.

Contribution Rate-Setting Cycle

Under current Washington State law, in July of even-numbered years, the Pension Funding Council (PFC) reviews the basic contribution rates calculated by OSA based on an actuarial valuation performed on asset, participant, and plan information compiled in odd-numbered years. In calculating basic contribution rates, OSA applies the statutory funding policies described in this section.

The PFC may adopt changes to contribution rates by an affirmative vote of at least four members. The basic rates adopted by the PFC will remain in place for the ensuing biennium, subject to revision by the Legislature. The LEOFF 2 Board performs these duties for LEOFF 2 under the same cycle.

RCW 41.45.070 requires that a temporary and supplemental contribution rate increase be charged to fund the cost of benefit enhancements enacted following the adoption of the basic rates. Supplemental contribution rates are included in the basic rates at the beginning of the next contribution rate-setting cycle.

Funding Policy

Washington State relies on systematic actuarial funding to finance the on-going cost of the state retirement systems. Under this financing approach, we reduce the cost of future pension payments by the expected long-term return on invested contributions.

The state's funding policy is found in **Chapter 41.45 RCW** — Actuarial Funding of State Retirement Systems. It includes the following goals — to:

- Provide a dependable and systematic process for funding the benefits to members and retirees of the Washington State retirement systems.
- Fully fund the retirement system Plans 2 and 3, and Washington State Patrol Retirement System (WSPRS), as provided by law.
- Fully amortize the total cost of Law Enforcement Officer's and Fire Fighters' (LEOFF) Plan 1 not later than June 30, 2024.
- Fully amortize the Unfunded Actuarial Accrued Liability (UAAL) in PERS Plan 1 and TRS Plan 1 within a rolling ten-year period using methods and assumptions that balance needs for increased benefit security, decreased contribution rate volatility, and affordability of pension contribution rates.
- Establish long-term employer contribution rates that will remain a relatively predictable proportion of future state budgets.
- Fund, to the extent feasible, all benefits for Plans 2 and 3 members over the working lives of those members so that the taxpayers who receive the benefit of those members' service pay the cost of those benefits.

Based on the funding policy, the same contribution rate is charged to employers within each system regardless of the plan in which employees hold membership (except for LEOFF). In addition, all benefit increases that become effective after June 30, 2009, for PERS Plan 1 and TRS Plan 1 members, are funded over a fixed ten-year period.

If all actuarial assumptions are realized and all future contributions required under this funding policy are made, we expect the funding policy to accumulate sufficient assets to provide for all future benefits for current members when due.

The Washington State Investment Board (WSIB) directs the investment of retirement system contributions. **RCW 43.33A.110** requires WSIB to maximize investment returns at a prudent level of risk.

Comments on 2016 Results

Many factors can influence how actuarial valuation results change from one measurement date to the next. Those factors include changes in the covered population, changes in plan provisions, assumptions, and methods, and experience that varies from our expectations.

For this valuation, we observed no significant changes in the covered population. We also made no significant changes to our actuarial assumptions or methods. Plan provisions regarding pensionable overtime changed for WSPRS members. In addition, some minor provisions changed for certain members in Public Safety Employees' Retirement System (PSERS) and LEOFF 2; otherwise, plan provisions were unchanged. See the **Summary of Plan Provisions** section of this report for more details.

In terms of annual plan experience, the actual rate of investment return on the Market Value of Assets was 2.65 percent and below the assumed rate. The rate of investment return on the actuarial (or smoothed) value of assets was lower than expected for the plan year. Salaries grew more than expected for all plans except PSERS 2 and LEOFF 2.

Detailed gain and loss information by system can be found in the Actuarial Exhibits section of this report. Please see the Actuarial Certification Letter for additional comments on the valuation results.

Actuarial Liabilities

The next table summarizes key measures of actuarial liability along with the liabilities from last year's valuation. The Future Value of Fully Projected Benefits represents the total expected value of all future benefit payments for all members of all systems as of the valuation date. The Present Value of Fully Projected Benefits represents today's value of the Future Value of Fully Projected Benefits when we discount future benefit payments with the valuation interest rate. In other words, if we invest the Present Value of Fully Projected Benefits as a lump sum amount at the valuation date and earn the valuation interest rate each year, there would be enough money to pay all expected future benefit payments for current members.

The Actuarial Accrued Liability identifies the portion of the present value of future benefits that has been accrued as of the valuation date based on the Entry Age Normal (EAN) actuarial cost method. The UAAL represents the excess, if any, of the Actuarial Accrued Liability at the valuation date over the Actuarial Value of Assets. In other words, the UAAL equals the actuarial accrued liability earned at the valuation date not covered by current actuarial assets.

See the Actuarial Exhibits section of this report for a summary of actuarial liabilities by system and plan. For projected benefit payments by year for each system and plan, please visit the **Interactive Reports** page on our website. Also, see the **Glossary** on our website for brief explanations of the actuarial terms.

Actuarial Liabilities		
(Dollars in Millions)	**2016**	**2015**
All Systems		
Future Value of Fully Projected Benefits	$658,821	$616,416
Present Value of Fully Projected Benefits	105,250	99,441
Accrued Liability*	88,170	83,477
Unfunded Actuarial Accrued Liability**	$7,592	$7,214
Valuation Interest Rate***	7.70%	7.70%

**Calculated using Entry Age Normal (EAN) cost method.*
***For PERS 1, TRS 1, and LEOFF 1.*
****7.50% in LEOFF 2.*

Assets

The following table shows the combined Market Value of Assets and Actuarial (or smoothed) Value of Assets along with approximate rates of investment return.

To limit the volatility in contribution rates and funded status due to short-term market fluctuations, we smooth (or defer recognition of) the difference between actual and expected annual investment returns over a period not to exceed eight years. The Actuarial Value of Assets equals the Market Value of Assets less the Total Deferred Investment Gains and (Losses) at the valuation date. The Actuarial Value of Assets can never be less than 70 percent or greater than 130 percent of the Market Value of Assets.

Assets		
(Dollars in Millions)	**2016**	**2015**
All Systems		
Market Value of Assets	$75,273	$74,490
Actuarial Value of Assets	74,345	71,460
Contributions*	2,866	2,301
Disbursements	3,910	3,695
Investment Return	1,760	3,276
Other**	$66	$56
Rate of Return on Assets***	2.65%	4.93%

**Employee and Employer.*
***Includes transfers, restorations, payables, etc.*
****This is the time-weighted rate of return on the Market Value of Assets, net of expenses. The Actuarial Value of Assets is used in determining contribution rates.*

See the **Actuarial Exhibits** section of this report for a summary of assets by system and plan, and for the development of the Actuarial Value of Assets.

Funded Status

The funded status helps readers evaluate the health of a pension plan. A history of funded status measured consistently over a defined period helps readers evaluate a plan's funding progress over time. The funded status represents the portion of the actuarial accrued liability covered by today's actuarial assets. A plan with a 100 percent funded status has one dollar in actuarial assets for each dollar of accrued liability at the valuation date. A plan with a funded status of at least 100 percent is generally considered to be on target with its financing plan. However, a plan more/less than 100 percent funded is not automatically considered over-funded/at-risk.

In this report, we present funded status based on the EAN cost method only. Prior reports included funded status results based on the Projected Unit Credit (PUC) cost method.

The table above displays the funded status for all the systems combined. We provide this table for summarization purposes only. Absent a qualified merger or plan termination, assets from an individual qualified retirement plan may not be used to fund benefits from another plan. See the **Actuarial Exhibits** section of this report for the funded status by system and plan.

Funded Status		
(Dollars in Millions)	**2016**	**2015**
All Systems		
a. Accrued Liability*	$88,170	$83,477
b. Market Value of Assets	75,273	74,476
c. Deferred Gains/(Losses)**	928	3,016
d. Actuarial Value of Assets (b-c)	74,345	71,460
Unfunded Liability (a-d)	$13,825	$12,017
Funded Ratio (d/a)	84%	86%

Note: Totals may not agree due to rounding.
**Liabilities valued using Entry Age Normal cost method.*
***Includes expected receivables.*

Participant Data

The next table summarizes participant data used in the actuarial valuation for the plan year ending June 30, 2016, along with information from last year's valuation. See the **Participant Data** section of this report for participant data summarized by system and plan.

Participant Data		
All Systems	**2016**	**2015**
Active Members		
Number	309,022	301,260
Total Salaries (in Millions)	$18,894	$17,823
Average Annual Salary	$61,141	$59,160
Average Attained Age	47.1	47.3
Average Service	11.7	12.0
Retirees and Beneficiaries		
Number	170,771	163,788
Average Annual Benefit	$22,474	$22,187
Terminated Members		
Number Vested	60,092	57,981
Number "Non-Vested"	130,036	125,114

Key Assumptions

This table displays key economic assumptions used in the actuarial valuation. With this valuation, we increased the assumed TRS system growth from 0.80 percent to 1.25 percent.

Key Assumptions	
All Systems	
Valuation Interest Rate*	7.70%
Salary Increase	3.75%
Inflation	3.00%
Growth in Membership**	0.95%

**7.50% in LEOFF 2.*
***1.25% in TRS. Used for the amortization of PERS 1, and TRS 1 UAAL only.*

II. Actuarial Exhibits

Office of the State Actuary

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Actuarial Certification Letter
Report of the Combined
Actuarial Valuation
As of June 30, 2016

August 2017

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 based on a June 30, 2016, measurement date, consistent with the prescribed funding policies. These contribution requirements are purely informational since, according to state law, this "off-cycle" valuation is not used to determine contribution rates. 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 methods, assumptions,

PO Box 40914 | Olympia, Washington 98504-0914 | state.actuary@leg.wa.gov | leg.wa.gov/osa
Phone: 360.786.6140 | Fax: 360.586.8135 | TDD: 711

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. As a result of this method, all employers of PERS, School Employees' Retirement System (SERS), and Public Safety Employees' Retirement System (PSERS) contribute to the PERS 1 UAAL. All employers of TRS contribute to the TRS 1 UAAL. 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	
	2016	2015	2016	2015
PERS				
Member*	6.00%	6.00%	8.34%	7.92%
Employer (Normal Cost)	8.45%	8.03%	8.45%	8.03%
Employer (Plan 1 UAAL)	5.05%	5.22%	5.05%	5.22%
Total Employer	13.50%	13.25%	13.50%	13.25%
TRS				
Member*	6.00%	6.00%	7.98%	7.48%
Employer (Normal Cost)	8.75%	8.25%	8.75%	8.25%
Employer (Plan 1 UAAL)	7.43%	7.60%	7.43%	7.60%
Total Employer	16.18%	15.85%	16.18%	15.85%
SERS				
Member*	N/A	N/A	8.46%	7.80%
Employer (Normal Cost)	N/A	N/A	9.46%	8.80%
Employer (PERS Plan 1 UAAL)	N/A	N/A	5.05%	5.22%
Total Employer	N/A	N/A	14.51%	14.02%
PSERS				
Member	N/A	N/A	6.98%	6.98%
Employer (Normal Cost)	N/A	N/A	6.98%	6.98%
Employer (PERS Plan 1 UAAL)	N/A	N/A	5.05%	5.22%
Total Employer	N/A	N/A	12.03%	12.20%
LEOFF				
Member	0.00%	0.00%	7.91%	7.88%
Employer	0.00%	0.00%	4.75%	4.73%
State (Normal Cost)	0.00%	0.00%	3.16%	3.15%
State (Plan 1 UAAL)	0.00%	0.00%	0.00%	0.00%
Total State	0.00%	0.00%	3.16%	3.15%
WSPRS				
Member	7.68%	7.34%	7.68%	7.34%
Employer (State)	24.86%	14.90%	24.86%	14.90%

Note: Employer rates exclude administrative expense rate.

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

Development of 2016 Employer/State Rates					
	PERS		TRS		SERS
	Plan 1	Plan 2/3	Plan 1	Plan 2/3	Plan 2/3
a. Total Normal Cost	14.45%	16.79%	14.75%	16.73%	17.92%
b. Member Normal Cost*	6.00%	8.34%	6.00%	7.98%	8.46%
c. Employer Contribution (a-b)	8.45%	8.45%	8.75%	8.75%	9.46%
d. Cost to Amortize UAAL	5.05%	5.05%	7.43%	7.43%	5.05%
e. Total Employer Rate (c+d)	**13.50%**	**13.50%**	**16.18%**	**16.18%**	**14.51%**

Note: Employer rates exclude administrative expense rate.

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

Development of 2016 Employer/State Rates (Continued)	PSERS	LEOFF		WSPRS
	Plan 2	Plan 1	Plan 2	
a. Total Normal Cost	13.95%	0.00%	15.82%	32.54%
b. Member Normal Cost*	6.98%	0.00%	7.91%	7.68%
c. Employer Contribution (a-b)	6.98%	0.00%	7.91%	24.86%
d. Cost to Amortize UAAL	5.05%	0.00%	0.00%	N/A
e. Total Employer Rate (c+d)**	**12.03%**	**0.00%**	**4.75%**	**24.86%**

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 7.91% to 4.75%.*

TRS Plan 2 Maximum Member Contribution Rates

Valuation Year	Prior Max	Supplemental	Source	Description	New Max
2010 - 2016	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
2016	7.34%	0.34%	C 181 L 17	Expanded the definition of pensionable overtime	7.68%
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 Washington State Patrol Retirement System (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.

We also provide interactive contribution rate calculations on the **Interactive Reports** page of our website. This interactive report calculates member and employer contribution rates that vary based on the asset valuation method and discount rate that the user selects. The state's funding policy, defined under Chapter 41.45 RCW, does not vary based on these selections.

Development of Normal Cost Rates				
(Dollars in Millions)		PERS 2/3	TRS 2/3	SERS 2/3
1. Calculation of Member Normal Cost Rate				
a.	Future Value of Fully Projected Benefits	$290,162	$150,341	$37,781
b.	Present Value of Fully Projected Benefits	42,406	16,076	5,974
c.	Valuation Assets	30,262	10,722	4,181
d.	Unfunded Fully Projected Benefits (b - c)	12,143	5,354	1,793
e.	Past Liability Balance	33	139	25
f.	Adjusted Unfunded (d - e)	$12,110	$5,214	$1,768
Present Value of Projected Salaries to Current Members (PVS)				
g.	Plan 1 PVS	N/A	N/A	N/A
h.	Plan 2 PVS	63,478	13,014	6,425
i.	Plan 3 PVS	18,198	39,288	8,042
j.	Weighted PVS (2g + 2h + i)	$145,155	$65,315	$20,892
k.	Employee Normal Cost (f / j)	8.34%	7.98%	8.46%
l.	Employee Minimum Contribution Rate	4.35%	5.14%	4.56%
m.	Prior Year Employee Maximum Contribution Rate[1]	N/A	8.64%	N/A
n.	Employee Contribution Rate with Max/Min	8.34%	7.98%	8.46%
o.	Change In Plan Provisions (Laws of 2017)	(0.00%)	0.00%	0.00%
p.	Employee Contribution Rate (n + o)[2]	8.34%	7.98%	8.46%
2. Calculation of Employer Normal Cost Rate				
a.	Present Value of Fully Projected Benefits	$42,406	$16,076	$5,974
b.	Valuation Assets	30,262	10,722	4,181
c.	Unfunded Benefits (a - b)	12,143	5,354	1,793
d.	Present Value of Employee Contributions	5,296	1,039	544
e.	Past Liability Balance	33	139	25
f.	Employer Responsibility (c - d - e)	$6,814	$4,175	$1,224
Present Value of Projected Salaries to Current Members (PVS)				
g.	Plan 1 PVS	N/A	N/A	N/A
h.	Plan 2 PVS	63,478	13,014	6,425
i.	Plan 3 PVS	18,198	39,288	8,042
j.	Total PVS (g + h + i)	$81,677	$52,302	$14,467
k.	Employer Normal Cost (f / j)	8.34%	7.98%	8.46%
l.	Employer Minimum Contribution Rate	4.35%	5.14%	4.56%
m.	Employer Contribution Rate with Minimum	8.34%	7.98%	8.46%
n.	Excess Employer Rate[1]	N/A	0.00%	N/A
o.	Rate to Amortize Past Liability Balance[3]	0.11%	0.77%	1.00%
p.	Change In Plan Provisions (Laws of 2017)	(0.00%)	0.00%	0.00%
q.	Employer Contribution Rate (m + n + o + p)	8.45%	8.75%	9.46%
3. Normal Cost Rates Adopted for 2017-19[4]				
a.	Employee Contribution Rate[5]	7.38%	7.06%	7.27%
b.	Employer Contribution Rate[5]	7.49%	7.83%	8.27%
c.	State Contribution Rate[5]	N/A	N/A	N/A
d.	Total Contribution Rate (a + b + c)	**14.87%**	**14.89%**	**15.54%**

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] 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 the PFC.

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

Development of Normal Cost Rates (Continued)				
(Dollars in Millions)		**PSERS 2**	**LEOFF 2**	**WSPRS**
1. Calculation of Member Normal Cost Rate				
a.	Future Value of Fully Projected Benefits	$12,495	$101,327	$8,334
b.	Present Value of Fully Projected Benefits	876	13,013	1,358
c.	Valuation Assets	402	10,021	1,084
d.	Unfunded Fully Projected Benefits (b - c)	474	2,992	274
e.	Past Liability Balance	0	0	9
f.	Adjusted Unfunded (d - e)	$474	$2,992	$266
Present Value of Projected Salaries to Current Members (PVS)				
g.	Plan 1 PVS	N/A	N/A	$304
h.	Plan 2 PVS	3,404	19,632	565
i.	Plan 3 PVS	N/A	N/A	N/A
j.	Weighted PVS (2g + 2h + i)	$6,808	$39,265	$1,739
k.	Employee Normal Cost (f / j)	6.97%	7.62%	15.27%
l.	Employee Minimum Contribution Rate	5.61%	7.91%	7.40%
m.	Prior Year Employee Maximum Contribution Rate[1]	N/A	N/A	7.34%
n.	Employee Contribution Rate with Max/Min	6.97%	7.91%	7.34%
o.	Change In Plan Provisions (Laws of 2017)	0.01%	0.00%	0.34%
p.	Employee Contribution Rate (n + o)	6.98%	7.91%	7.68%
2. Calculation of Employer Normal Cost Rate				
a.	Present Value of Fully Projected Benefits	$876	$13,013	$1,358
b.	Valuation Assets	402	10,021	1,084
c.	Unfunded Benefits (a - b)	474	2,992	274
d.	Present Value of Employee Contributions	237	1,496	133
e.	Past Liability Balance	0	0	9
f.	Employer Responsibility (c - d - e)	$237	$1,496	$133
Present Value of Projected Salaries to Current Members (PVS)				
g.	Plan 1 PVS	N/A	N/A	$304
h.	Plan 2 PVS	3,404	19,632	565
i.	Plan 3 PVS	N/A	N/A	N/A
j.	Total PVS (g + h + i)	$3,404	$19,632	$869
k.	Employer Normal Cost (f / j)	6.97%	7.62%	15.27%
l.	Employer Minimum Contribution Rate	5.61%	7.91%	7.40%
m.	Employer Contribution Rate with Minimum	6.97%	7.91%	15.27%
n.	Excess Employer Rate[1]	N/A	N/A	7.93%
o.	Rate to Amortize Past Liability Balance[2]	N/A	N/A	1.32%
p.	Change In Plan Provisions (Laws of 2017)	0.01%	0.00%	0.34%
q.	Employer Contribution Rate (m + n + o + p)	6.98%	7.91%	24.86%
3. Normal Cost Rates Adopted for 2017-19[3]				
a.	Employee Contribution Rate[4]	6.73%	8.75%	7.34%
b.	Employer Contribution Rate[4]	6.73%	5.25%	12.81%
c.	State Contribution Rate[4]	N/A	3.50%	N/A
d.	Total Contribution Rate (a + b + c)	**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] WSPRS liability is attributable to past costs for improved survivor benefits.

[3]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 the PFC.

[4]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	$28,203	$20,050	$10,129
b.	Present Value of Fully Projected Benefits (PVFB)	$12,409	$8,927	$4,202
c	Valuation Assets	$6,958	$5,440	$5,275
d.	Actuarial Present Value of Future Normal Costs	$90	$31	$0
e.	Balance of Plan 1 Benefit Improvements After 2009	$106	$47	N/A
f.	UAAL (b - c - d - e)	$5,255	$3,410	($1,073)
g.	Expected UAAL Contributions to 2017	N/A	N/A	$0
h.	Remaining UAAL (f - g)	$5,255	$3,410	($1,073)
i.	Amortization Date	N/A	N/A	6/30/2024
j.	Present Value of Projected Salaries*	$106,995	$46,820	$8,072
k.	Contribution Rate Before Adjustments (h / j)	4.91%	7.28%	(13.30%)
l.	Minimum Contribution Rate	3.50%	5.75%	N/A
m.	Preliminary Contribution Rate**	4.91%	7.28%	(13.30%)
n.	Plan 1 Benefit Improvements After 2009	0.14%	0.15%	N/A
o.	Change In Plan Provisions (Laws of 2017)	0.00%	0.00%	0.00%
p.	Contribution Rate to Amortize the UAAL (m + n + o)**	5.05%	7.43%	(13.30%)
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		
	Plan 1	Plans 2/3	Total	Plan 1	Plans 2/3	Total
Active Members						
Retirement	$998	$27,309	$28,307	$423	$11,472	$11,895
Termination	0	918	918	0	408	408
Death	12	272	284	3	96	98
Disability	0	154	154	0	13	13
ROC* on Termination	0	321	321	0	39	39
ROC* on Death	19	246	265	6	28	35
Total Active	**$1,030**	**$29,220**	**$30,250**	**$432**	**$12,056**	**$12,489**
Inactive Members						
Terminated	$119	$2,909	$3,029	$30	$1,072	$1,102
Service Retired	10,465	9,791	20,255	8,002	2,874	10,876
Disability Retired	109	142	251	80	12	92
Survivors	686	344	1,030	382	62	444
Total Inactive	**$11,379**	**$13,186**	**$24,565**	**$8,495**	**$4,019**	**$12,514**
Laws of 2017	**0**	**(3)**	**(3)**	**0**	**0**	**0**
2016 Total	**$12,409**	**$42,403**	**$54,812**	**$8,927**	**$16,076**	**$25,003**
2015 Total	**$12,655**	**$39,236**	**$51,891**	**$9,144**	**$14,511**	**$23,655**

Note: Totals may not agree due to rounding.

**Return of Contributions.*

Present Value of Fully Projected Benefits (Continued)						
(Dollars in Millions)	SERS	PSERS	LEOFF			WSPRS
	Plans 2/3	Plan 2	Plan 1	Plan 2	Total	
Active Members						
Retirement	$3,633	$740	$77	$8,718	$8,796	$532
Termination	215	49	0	155	155	4
Death	38	6	1	126	127	5
Disability	16	5	0	401	401	2
ROC* on Termination	38	24	0	100	100	2
ROC* on Death	23	9	0	148	148	2
Total Active	**$3,963**	**$833**	**$78**	**$9,648**	**$9,726**	**$547**
Inactive Members						
Terminated	$593	$32	$1	$283	$284	$18
Service Retired	1,364	10	1,859	2,772	4,631	726
Disability Retired	17	0	1,650	183	1,833	7
Survivors	37	0	614	127	741	61
Total Inactive	**$2,011**	**$43**	**$4,123**	**$3,365**	**$7,488**	**$811**
Laws of 2017	**0**	**3**	**0**	**0**	**0**	**10**
2016 Total	**$5,974**	**$879**	**$4,202**	**$13,013**	**$17,215**	**$1,368**
2015 Total	**$5,411**	**$780**	**$4,313**	**$12,152**	**$16,465**	**$1,240**

Note: Totals may not agree due to rounding.

**Return of Contributions.*

Entry Age Normal Accrued Liability*						
(Dollars in Millions)	PERS			TRS		
	Plan 1	Plans 2/3	Total	Plan 1	Plans 2/3	Total
Active Members						
Retirement	$934	$21,016	$21,950	$401	$7,781	$8,183
Termination	(9)	293	284	(3)	115	112
Death	11	205	216	3	63	66
Disability	(2)	79	76	(1)	5	4
ROC** on Termination	(7)	(185)	(192)	(1)	(13)	(14)
ROC** on Death	18	166	184	6	12	18
Total Active	**$945**	**$21,574**	**$22,518**	**$405**	**$7,964**	**$8,369**
Inactive Members						
Terminated	$119	$2,909	$3,029	$30	$1,072	$1,102
Service Retired	10,465	9,791	20,255	8,002	2,874	10,876
Disability Retired	109	142	251	80	12	92
Survivors	686	344	1,030	382	62	444
Total Inactive	**$11,379**	**$13,186**	**$24,565**	**$8,495**	**$4,019**	**$12,514**
Laws of 2017	**0**	**(1)**	**(1)**	**0**	**0**	**0**
2016 Total	**$12,323**	**$34,759**	**$47,082**	**$8,900**	**$11,983**	**$20,883**
2015 Total	**$12,553**	**$32,008**	**$44,561**	**$9,107**	**$10,831**	**$19,939**

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.*

Entry Age Normal Accrued Liability* (Continued)						
(Dollars in Millions)	SERS	PSERS		LEOFF		WSPRS
	Plans 2/3	Plan 2	Plan 1	Plan 2	Total	
Active Members						
Retirement	$2,719	$362	$76	$5,849	$5,925	$365
Termination	59	17	(0)	31	31	1
Death	27	3	1	45	46	2
Disability	7	2	(2)	221	218	1
ROC** on Termination	(11)	(5)	0	(29)	(29)	(1)
ROC** on Death	14	4	0	89	90	1
Total Active	**$2,815**	**$382**	**$74**	**$6,206**	**$6,280**	**$370**
Inactive Members						
Terminated	$593	$32	$1	$283	$284	$18
Service Retired	1,364	10	1,859	2,772	4,631	726
Disability Retired	17	0	1,650	183	1,833	7
Survivors	37	0	614	127	741	61
Total Inactive	**$2,011**	**$43**	**$4,123**	**$3,365**	**$7,488**	**$811**
Laws of 2017	**0**	**0**	**0**	**0**	**0**	**5**
2016 Total	**$4,826**	**$425**	**$4,197**	**$9,571**	**$13,768**	**$1,186**
2015 Total	**$4,381**	**$357**	**$4,307**	**$8,838**	**$13,146**	**$1,093**

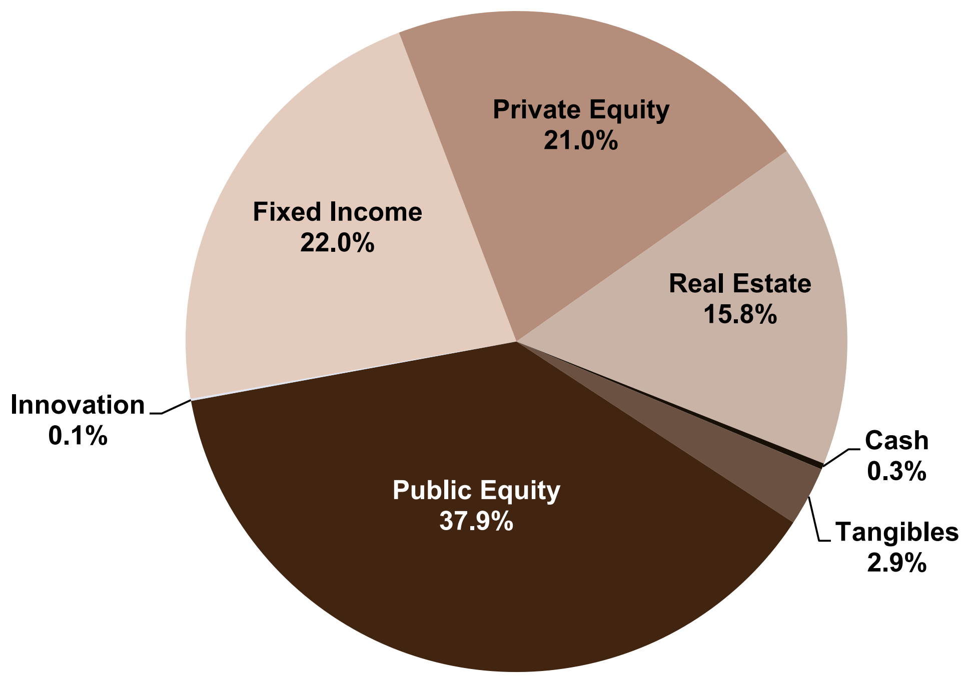
Note: Totals may not agree due to rounding.

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

We report expected projected benefit payments on our website by year and by plan under the statutorily assumed interest rate. We also show supplementary benefit payment projections that vary by interest rate assumptions. For more information or to view projected benefit payments, please visit the **Interactive Reports** page on our website.

Plan Assets

Retirement Commingled Trust Fund (CTF) Asset Allocation



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 Fund 631	Plan 2/3* Fund 641	Total	Plan 1 Fund 632	Plan 2/3* Fund 642	Total
2015 Market Value	**$7,558**	**$29,512**	**$37,070**	**$6,070**	**$10,377**	**$16,447**
Revenue						
Contributions						
Employee	14	473	486	5	64	69
Employer/State	596	563	1,159	316	316	632
Total Contributions	610	1,036	1,646	321	380	701
Investment Return	157	725	883	118	259	377
Restorations	5	25	30	4	4	8
Transfers In	0	0	0	0	0	0
Miscellaneous	(0)	0	0	0	0	0
Total Revenue	**$772**	**$1,786**	**$2,558**	**$443**	**$644**	**$1,087**
Disbursements						
Monthly Benefits**	$1,199	$776	$1,975	$924	$218	$1,142
Refunds	4	36	41	1	3	4
Total Benefits	1,203	813	2,016	926	221	1,147
Transfers Out	0	2	2	0	1	1
Expenses	0	1	1	0	0	0
Total Disbursements	**$1,204**	**$816**	**$2,019**	**$926**	**$222**	**$1,147**
Payables	$0	$0	$0	$0	$0	$0
2016 Market Value	**$7,126**	**$30,483**	**$37,609**	**$5,587**	**$10,799**	**$16,386**
2016 Actuarial Value	**$6,958**	**$30,262**	**$37,221**	**$5,440**	**$10,722**	**$16,161**
Ratio (AV/MV)	**98%**	**99%**	**99%**	**97%**	**99%**	**99%**

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* Fund 633	Plan 2 Fund 635	Plan 1 Fund 819	Plan 2 Fund 829	Total	Fund 615	
2015 Market Value	**$4,067**	**$353**	**$5,610**	**$9,833**	**$15,443**	**$1,111**	**$74,490**
Revenue							
Contributions							
Employee	46	21	0	152	152	6	780
Employer/State	115	20	0	152	152	7	2,086
Total Contributions	161	41	0	304	304	13	2,866
Investment Return	100	10	121	244	365	25	1,760
Restorations	1	0	1	22	23	3	65
Transfers In	0	0	0	0	0	0	1
Miscellaneous	0	0	(0)	0	(0)	(0)	0
Total Revenue	**$263**	**$51**	**$122**	**$570**	**$692**	**$42**	**$4,692**
Disbursements							
Monthly Benefits	113	1	360	184	545	54	3,829
Refunds	2	3	1	7	7	1	58
Total Benefits	115	3	361	191	552	54	3,887
Transfers Out	1	0	0	16	16	0	20
Expenses	0	0	0	2	2	0	3
Total Disbursements	**$116**	**$3**	**$361**	**$208**	**$569**	**$54**	**$3,910**
Payables	$0	$0	$0	$0	$0	$0	$0
2016 Market Value	**$4,214**	**$401**	**$5,371**	**$10,194**	**$15,565**	**$1,098**	**$75,273**
2016 Actuarial Value	**$4,181**	**$402**	**$5,275**	**$10,021**	**$15,296**	**$1,084**	**$74,345**
Ratio (AV/MV)	**99%**	**100%**	**98%**	**98%**	**98%**	**99%**	**99%**

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***	**TRS 1**	**TRS 2/3***	**SERS 2/3***
a.	Market Value at 6/30/2016			$7,126	$30,483	$5,587	$10,799	$4,214
b.	Deferred Gains and (Losses)							
	Plan Year Ending	**Years Deferred**	**Years Remaining**					
	6/30/2016	6	5	($334)	($1,293)	($269)	($453)	($178)
	6/30/2015	4	2	(127)	(446)	(104)	(155)	(61)
	6/30/2014	8	5	479	1,632	394	566	223
	6/30/2013	5	1	63	184	52	63	25
	6/30/2012	7	2	(150)	(374)	(126)	(127)	(51)
	6/30/2011	8	2	239	540	200	183	74
Total Deferral				$169	$242	$147	$77	$33
c.	Market Value less Deferral (a-b)			$6,957	$30,241	$5,440	$10,722	$4,181
d.	Receivables**			$1	$22	$0	$0	$0
e.	**Market Value with Receivables (c+d)**			**$6,958**	**$30,262**	**$5,440**	**$10,722**	**$4,181**
f.	70% of Market Value of Assets			$4,988	$21,338	$3,911	$7,559	$2,950
g.	130% of Market Value of Assets			$9,264	$39,627	$7,263	$14,039	$5,478
h.	**Actuarial Value of Assets****			**$6,958**	**$30,262**	**$5,440**	**$10,722**	**$4,181**

Note: Totals may not agree due to rounding.

**Defined Benefit portion only.*

***PERS receivables result from the court ruling on Dolan v. King County. Amount includes attorney fees paid from the fund but not yet reimbursed of $12.544 million and an interest payment due of $10.500 million on past contributions. Receivables are adjusted for interest to 6/30/2016.*

****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**	**WSPRS**	**Total**
a.	Market Value at 6/30/2016			$401	$5,371	$10,194	$1,098	$75,273
b.	Deferred Gains and (Losses)							
	Plan Year Ending	**Years Deferred**	**Years Remaining**					
	6/30/2016	6,5*	5,4*	($15)	($248)	($414)	($49)	($3,253)
	6/30/2015	4,3*	2,1*	(5)	(91)	(89)	(18)	(1,095)
	6/30/2014	8	5	17	342	548	65	4,264
	6/30/2013	5	1	2	43	64	8	504
	6/30/2012	7	2	(3)	(96)	(111)	(17)	(1,054)
	6/30/2011	8	2	3	146	175	25	1,585
Total Deferral				($1)	$96	$173	$14	$951
c.	Market Value less Deferral (a-b)			$402	$5,275	$10,021	$1,084	$74,322
d.	Receivables			$0	$0	$0	$0	$23
e.	**Market Value with Receivables (c+d)**			**$402**	**$5,275**	**$10,021**	**$1,084**	**$74,345**
f.	70% of Market Value of Assets			$281	$3,760	$7,136	$769	$52,691
g.	130% of Market Value of Assets			$521	$6,982	$13,253	$1,428	$97,855
h.	**Actuarial Value of Assets****			**$402**	**$5,275**	**$10,021**	**$1,084**	**$74,345**

Note: Totals may not agree due to rounding

**2016: PSERS 2=5 years deferred, 4 years remaining; all other plans = 6 years deferred, 5 years remaining.*

2015: LEOFF 2 = 3 years deferred, 1 years remaining; all other plans = 4 years deferred, 2 years remaining.

***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.	2015 Market Value (at WSIB)	$7,558	$29,454	$6,071	$10,339	$4,051
b.	Total Cash Flow	(631)	251	(696)	252	61
c.	2016 Market Value (at WSIB)	7,085	30,437	5,494	10,853	4,214
d.	Actual Return (c - b - a)	$158	$731	$119	$262	$101
e.	Weighted Asset Amount	$7,262	$29,657	$5,738	$10,474	$4,087
f.	Expected Return (7.7% x e)	559	2,284	442	806	315
g.	Investment Gain/(Loss) for Prior Year (d - f)	(401)	(1,552)	(322)	(544)	(213)
h.	Dollar-Weighted Rate of Return	2.18%	2.47%	2.08%	2.51%	2.48%

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.	2015 Market Value (at WSIB)	$350	$5,609	$9,804	$1,110	$74,344
b.	Total Cash Flow	38	(361)	114	(38)	(1,010)
c.	2016 Market Value (at WSIB)	399	5,370	10,162	1,097	75,110
d.	Actual Return (c - b - a)	$10	$122	$245	$26	$1,776
e.	Weighted Asset Amount	$370	$5,446	$9,894	$1,094	$74,023
f.	Expected Return (7.7% x e)*	29	419	742	84	5,680
g.	Investment Gain/(Loss) for Prior Year (d - f)	(18)	(297)	(497)	(59)	(3,904)
h.	Dollar-Weighted Rate of Return	2.74%	2.24%	2.48%	2.34%	2.40%

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.

Consistent with financial reporting under Governmental Accounting Standards Board (GASB) requirements, we report funded status using the Entry Age Normal (EAN) actuarial cost method. 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 funded 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 2016 investment gains or losses, we used an investment return assumption of 7.7 percent (7.5 percent for the 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 the **Interactive Reports** page on our website 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
	Plan 1	Plan 2/3	Plan 1	Plan 2/3	Plan 2/3
Accrued Liability	$12,323	$34,759	$8,900	$11,983	$4,826
Valuation Assets	$6,958	$30,262	$5,440	$10,722	$4,181
Unfunded Liability	$5,365	$4,497	$3,460	$1,261	$644
Funded Ratio					
2016	**56%**	**87%**	**61%**	**89%**	**87%**
2015	58%	88%	64%	92%	89%
2014	61%	90%	69%	94%	91%

Note: Totals may not agree due to rounding.

**Liabilities valued using the EAN cost method at an interest rate of 7.7%. All assets have been valued under the actuarial asset method.*

Funded Status on an Actuarial Value Basis* (Continued)					
(Dollars in Millions)	**PSERS**	**LEOFF**		**WSPRS**	**Total**
	Plan 2	**Plan 1**	**Plan 2**		
Accrued Liability	$425	$4,197	$9,571	$1,186	$88,170
Valuation Assets	$402	$5,275	$10,021	$1,084	$74,345
Unfunded Liability	$24	($1,078)	($450)	$102	$13,825
Funded Ratio					
2016	**94%**	**126%**	**105%**	**91%**	**84%**
2015	95%	125%	105%	98%	86%
2014	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, and 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 Gain/Loss

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 from various sources, with respect to assets, liabilities, and salaries. 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*
2015 Contribution Rate Before Laws of 2016	**13.25%**	**15.85%**	**14.02%**
Remove Rate Floor/Ceiling	0.00%	0.00%	0.00%
Remove Plan 1 Benefit Improvements After 2009	(0.14%)	(0.15%)	(0.14%)
Remove Prior Liability and Fixed Amortization Date Adjustment	(0.11%)	(0.77%)	(1.00%)
2015 Adjusted Contribution Rate	**13.00%**	**14.93%**	**12.88%**
Liability Gains/Losses	0.85%	1.27%	1.52%
Asset Gains/Losses	0.88%	1.32%	0.71%
Present Value of Future Salaries Gains/Losses	(1.40%)	(2.08%)	(1.47%)
Incremental Changes	0.01%	(0.13%)	0.01%
Other Gains/Losses	(0.09%)	(0.05%)	(0.28%)
Total Change	**0.25%**	**0.33%**	**0.49%**
2016 Preliminary Contribution Rate	**13.25%**	**15.26%**	**13.37%**
Increase from Applied Rate Floor	0.00%	0.00%	0.00%
Decrease from Applied Rate Ceiling	0.00%	0.00%	0.00%
Increase from Plan 1 Benefit Improvements After 2009	0.14%	0.15%	0.14%
Rate to Amortize Prior Liability	0.11%	0.77%	1.00%
Excess Member Rate	N/A	0.00%	N/A
Laws of 2017	0.00%	0.00%	0.00%
2016 Adjusted Contribution Rate	**13.50%**	**16.18%**	**14.51%**

**The SERS rate includes 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.*

Change in Employer and State Contribution Rate by Source (Continued)			
Change in Employer Rate	**PSERS***	**LEOFF****	**WSPRS**
2015 Contribution Rate Before Laws of 2016	**12.20%**	**(6.74%)**	**14.90%**
Remove Rate Floo /Ceiling	0.00%	(0.17%)	0.00%
Remove Plan 1 Benefit Improvements After 2009	(0.14%)	N/A	N/A
Remove Prior Liability and Fixed Amortization Date Adjustment	0.00%	(3.96%)	(4.44%)
2015 Adjusted Contribution Rate	**12.06%**	**(10.87%)**	**10.46%**
Liability Gains/Losses	0.66%	(0.67%)	1.57%
Asset Gains/Losses	0.06%	2.13%	2.02%
Present Value of Future Salaries Gains/Losses	(0.69%)	(0.49%)	(0.42%)
Incremental Changes	0.00%	0.00%	1.91%
Other Gains/Losses	(0.21%)	(0.35%)	(0.27%)
Total Change	**(0.18%)**	**0.62%**	**4.81%**
2016 Preliminary Contribution Rate	**11.88%**	**(10.25%)**	**15.27%**
Increase from Applied Rate Floor	0.00%	0.11%	0.00%
Decrease from Applied Rate Ceiling	0.00%	0.00%	N/A
Increase from Plan 1 Benefit Improvements After 2009	0.14%	N/A	N/A
Rate to Amortize Prior Liability	0.00%	0.00%	1.32%
Excess Member Rate	N/A	N/A	7.93%
Laws of 2017	0.01%	0.00%	0.34%
2016 Adjusted Contribution Rate	**12.03%**	**(10.14%)**	**24.86%**

**The PSERS rate includes 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**
2015 Normal Cost Before Laws of 2016	**8.03%**	**8.25%**	**8.80%**
Remove Rate Floor/Ceiling	0.00%	0.00%	0.00%
Remove Prior Employer Liability	(0.11%)	(0.77%)	(1.00%)
2015 Adjusted Normal Cost Rate	**7.92%**	**7.48%**	**7.80%**
Liabilities			
Salaries	0.05%	0.13%	0.52%
Termination	(0.12%)	(0.37%)	(0.16%)
Retirement	0.03%	0.04%	0.04%
Disability	0.01%	0.00%	0.01%
Mortality	0.03%	0.03%	0.03%
Growth / Return to Work	0.66%	1.32%	0.97%
Other Liabilities	0.16%	0.07%	0.11%
Total Liability Gains/Losses	**0.82%**	**1.22%**	**1.52%**
Asset Gains/Losses	**0.53%**	**0.45%**	**0.71%**
Present Value of Future Salaries Gains/Losses	**(0.84%)**	**(1.12%)**	**(1.47%)**
Incremental Changes			
Plan Change	0.00%	0.00%	0.00%
Method Change	0.00%	0.00%	0.00%
Assumption Change	0.00%	0.00%	0.00%
Correction Change	0.01%	0.01%	0.01%
Experience Study Change	0.00%	0.00%	0.00%
Total Incremental Changes Gains/Losses	**0.01%**	**0.01%**	**0.01%**
Other Gains/Losses	(0.10%)	(0.06%)	(0.11%)
Total Change	**0.42%**	**0.50%**	**0.66%**
2016 Preliminary Normal Cost	**8.34%**	**7.98%**	**8.46%**
Increase from Applied Rate Floor	0.00%	0.00%	0.00%
Rate to Amortize Prior Employer Liability	0.11%	0.77%	1.00%
Excess Member Rate	N/A	0.00%	N/A
Laws of 2017	0.00%	0.00%	0.00%
2016 Adjusted Normal Cost	**8.45%**	**8.75%**	**9.46%**

Change in Employer and State Plan 2/3 Normal Cost Rate by Source (Continued)			
Change in Normal Costs	**PSERS**	**LEOFF***	**WSPRS****
2015 Normal Cost Before Laws of 2016	**6.98%**	**3.15%**	**14.90%**
Remove Rate Floor/Ceiling	0.00%	(0.17%)	0.00%
Remove Prior Employer Liability	0.00%	0.00%	(4.44%)
2015 Adjusted Normal Cost Rate	**6.98%**	**2.98%**	**10.46%**
Liabilities			
Salaries	(0.06%)	(0.17%)	1.33%
Termination	(0.26%)	(0.03%)	(0.47%)
Retirement	0.00%	0.01%	(0.06%)
Disability	0.00%	0.00%	0.03%
Mortality	0.02%	0.00%	(0.04%)
Growth / Return to Work	0.93%	0.31%	0.36%
Other Liabilities	0.03%	0.04%	0.42%
Total Liability Gains/Losses	**0.66%**	**0.16%**	**1.57%**
Asset Gains/Losses	**0.06%**	**0.08%**	**2.02%**
Present Value of Future Salaries Gains/Losses	**(0.69%)**	**(0.17%)**	**(0.42%)**
Incremental Changes			
Plan Change	0.00%	0.00%	0.00%
Method Change	0.00%	0.00%	0.00%
Assumption Change	0.00%	0.00%	1.91%
Correction Change	0.00%	0.00%	0.00%
Experience Study Change	0.00%	0.00%	0.00%
Total Incremental Changes Gains/Losses	**0.00%**	**0.00%**	**1.91%**
Other Gains/Losses	(0.04%)	(0.00%)	(0.27%)
Total Change	**(0.01%)**	**0.07%**	**4.81%**
2016 Preliminary Normal Cost	**6.97%**	**3.05%**	**15.27%**
Increase from Applied Rate Floor	0.00%	0.11%	0.00%
Rate to Amortize Prior Employer Liability	0.00%	0.00%	1.32%
Excess Member Rate	N/A	N/A	7.93%
Laws of 2017	0.01%	0.00%	0.34%
2016 Adjusted Normal Cost	**6.98%**	**3.16%**	**24.86%**

**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***
2015 UAAL Rate Before Laws of 2016	**5.22%**	**7.60%**	**5.22%**
Remove Rate Floor/Ceiling	0.00%	0.00%	0.00%
Remove Plan 1 Benefit Improvements After 2009	(0.14%)	(0.15%)	(0.14%)
Fixed Amortization Date Adjustment	N/A	N/A	N/A
2015 Adjusted UAAL Rate	**5.08%**	**7.45%**	**5.08%**
Liabilities			
Salaries	0.01%	0.01%	N/A
Termination	0.00%	0.00%	N/A
Retirement	(0.01%)	0.00%	N/A
Disability	0.00%	0.00%	N/A
Mortality	(0.01%)	0.03%	N/A
Return to Work	0.00%	0.00%	N/A
Inflation (CPI)	0.00%	0.00%	N/A
Other Liabilities	0.04%	0.01%	N/A
Total Liability Gains/Losses	**0.03%**	**0.05%**	**N/A**
Asset Gains/Losses	**0.35%**	**0.87%**	**N/A**
Present Value of Future Salaries Gains/Losses	**(0.56%)**	**(0.96%)**	**N/A**
Incremental Changes			
Plan Change	0.00%	0.00%	N/A
Method Change	0.00%	0.00%	N/A
Assumption Change	0.00%	(0.14%)	N/A
Correction Change	0.00%	0.00%	N/A
Experience Study Change	0.00%	0.00%	N/A
Total Incremental Changes Gains/Losses	**0.00%**	**(0.14%)**	**N/A**
Other Gains/Losses	0.01%	0.01%	N/A
Total Change	**(0.17%)**	**(0.17%)**	**(0.17%)**
2016 Preliminary UAAL Rate	**4.91%**	**7.28%**	**4.91%**
Increase from Applied Rate Floor	0.00%	0.00%	0.00%
Decrease from Applied Rate Ceiling	0.00%	0.00%	0.00%
Increase from Plan 1 Benefit Improvements After 2009	0.14%	0.15%	0.14%
Laws of 2017	0.00%	0.00%	0.00%
2016 Adjusted UAAL Rate	**5.05%**	**7.43%**	**5.05%**

**The SERS rate funds the PERS Plan 1 UAAL.*

Change in Employer and State Plan 1 UAAL Rate by Source (Continued)			
Change in UAAL Rate	**PSERS***	**LEOFF****	**WSPRS**
2015 UAAL Rate Before Laws of 2016	**5.22%**	**(9.89%)**	**N/A**
Remove Rate Floor/Ceiling	0.00%	0.00%	N/A
Remove Plan 1 Benefit Improvements After 2009	(0.14%)	N/A	N/A
Fixed Amortization Date Adjustment	N/A	(3.96%)	N/A
2015 Adjusted UAAL Rate	**5.08%**	**(13.85%)**	**N/A**
Liabilities			
Salaries	N/A	(0.04%)	N/A
Termination	N/A	0.00%	N/A
Retirement	N/A	(0.01%)	N/A
Disability	N/A	0.00%	N/A
Mortality	N/A	(0.01%)	N/A
Return to Work	N/A	0.00%	N/A
Inflation (CPI)	N/A	(1.05%)	N/A
Other Liabilities	N/A	0.28%	N/A
Total Liability Gains/Losses	**N/A**	**(0.83%)**	**N/A**
Asset Gains/Losses	**N/A**	**2.05%**	**N/A**
Present Value of Future Salaries Gains/Losses	**N/A**	**(0.32%)**	**N/A**
Incremental Changes			
Plan Change	N/A	0.00%	N/A
Method Change	N/A	0.00%	N/A
Assumption Change	N/A	0.00%	N/A
Correction Change	N/A	0.00%	N/A
Experience Study Change	N/A	0.00%	N/A
Total Incremental Changes Gains/Losses	**N/A**	**0.00%**	**N/A**
Other Gains/Losses	N/A	(0.35%)	N/A
Total Change	**(0.17%)**	**0.55%**	**N/A**
2016 Preliminary UAAL Rate	**4.91%**	**(13.30%)**	**N/A**
Increase from Applied Rate Floor	0.00%	N/A	N/A
Decrease from Applied Rate Ceiling	0.00%	0.00%	N/A
Increase from Plan 1 Benefit Improvements After 2009	0.14%	N/A	N/A
Laws of 2017	0.00%	0.00%	N/A
2016 Adjusted UAAL Rate	**5.05%**	**(13.30%)**	**N/A**

**The PSERS rate funds 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.*

III. Participant Data

Overview of System Membership

The state administers nine retirement systems for state and local public employees. Retirement system membership is determined according to the participant's occupation and employer. Employees covered by each system are defined in separate chapters of the Revised Code of Washington.

In addition to the six systems described below, the state also administers benefits for volunteer fire fighters and two small judicial systems, which are not included in this valuation. The volunteer fire fighters have a separate actuarial valuation. The judicial systems are closed to new members, and any judge hired after June 30, 1988, becomes a member of the Public Employees' Retirement System Plans 2/3.

PERS - Public Employees' Retirement System Chapter 41.40 RCW	State employees; employees of all counties and most cities (some exceptions are Tacoma, Seattle, and Spokane); non-teaching employees of institutions of higher learning and community colleges; employees of ports, service districts, Energy Northwest, public utility districts, and judges first elected or appointed after June 30, 1988.
TRS - Teachers' Retirement System Chapter 41.32 RCW	Certificated teachers; administrators; and educational staff associates.
SERS - School Employees' Retirement System Chapter 41.35 RCW	Classified school district employees.
PSERS - Public Safety Employees' Retirement System Chapter 41.37 RCW	Correction officers (state, state community, county, city, and local community); state park rangers; enforcement officers with the Liquor Control Board, Washington State Patrol (commercial vehicle), Gambling Commission, and the Department of Natural Resources.
LEOFF - Law Enforcement Officers' and Fire Fighters' Retirement System Chapter 41.26 RCW	Fire fighters; emergency medical technicians; law enforcement officers including sheriffs; university, port, city police officers, and enforcement officers with the Department of Fish and Wildlife.
WSPRS - Washington State Patrol Retirement System Chapter 43.43 RCW	Commissioned officers of the Washington State Patrol.

Beginning with the 2015 valuation period, OSA performed valuations for certain retirement provisions under Higher Education Retirement Plans. These plans are offered to certain employees of colleges and universities in Washington and are not administered by the Department of Retirement Systems. The results of these valuations are provided in separate reports.

Active Membership By Employer and Plan as of June 30, 2016							
	All	PERS			TRS		
Employer	Systems	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3
State Agencies	60,761	1,009	43,324	12,166	8	32	48
Higher Education	22,684	338	14,402	7,569	7	6	247
Community Colleges	6,352	111	4,323	1,518	29	35	336
K-12	127,166	815	0	0	919	17,083	51,870
Counties	34,941	479	24,521	4,938	0	0	0
County Sub Divisions	13,689	151	10,521	2,638	0	0	0
First Class Cities	8,345	52	2,502	629	0	0	0
Other Cities	18,104	151	10,812	2,138	0	0	0
Ports	2,445	28	1,864	373	0	0	0
Education Service District	2,048	16	0	0	4	86	205
Fire Districts	4,523	5	698	89	0	0	0
Public Utility District	4,722	40	4,078	604	0	0	0
Water Districts	2,105	26	1,829	250	0	0	0
Energy Northwest	1,133	2	803	328	0	0	0
Unions	4	4	0	0	0	0	0
Total	**309,022**	**3,227**	**119,677**	**33,240**	**967**	**17,242**	**52,706**

Active Membership By Employer and Plan as of June 30, 2016 (Continued)							
	SERS		PSERS	LEOFF		WSPRS	
Employer	Plan 2	Plan 3	Plan 2	Plan 1	Plan 2	Plan 1	Plan 2
State Agencies	27	21	3,026	0	132	498	470
Higher Education	0	0	0	0	115	0	0
Community Colleges	0	0	0	0	0	0	0
K-12	25,033	31,446	0	0	0	0	0
Counties	0	0	2,150	8	2,845	0	0
County Sub Divisions	0	0	120	0	259	0	0
First Class Cities	0	0	28	32	5,102	0	0
Other Cities	0	0	159	12	4,832	0	0
Ports	0	0	0	0	180	0	0
Education Service District	890	847	0	0	0	0	0
Fire Districts	0	0	0	10	3,721	0	0
Public Utility District	0	0	0	0	0	0	0
Water Districts	0	0	0	0	0	0	0
Energy Northwest	0	0	0	0	0	0	0
Unions	0	0	0	0	0	0	0
Total	**25,950**	**32,314**	**5,483**	**62**	**17,186**	**498**	**470**

The following tables show participant data changes from last year's valuation to this year's valuation. We divide the participant data into two main categories:

- **Actives** — members accruing benefits in the plan
- **Annuitants** — members and beneficiaries receiving benefits from the plan.

Reconciliation of Participant Data								
	PERS				TRS			
	Plan 1	Plan 2	Plan 3	Total	Plan 1	Plan 2	Plan 3	Total
2015 Actives	3,927	117,768	31,602	153,297	1,353	15,342	52,125	68,820
Transfers	0	(246)	4,916	4,670	0	(122)	2,731	2,609
Hires/Rehires	96	13,170	900	14,166	11	3,487	1,999	5,497
New Retirees	(711)	(2,930)	(318)	(3,959)	(387)	(244)	(832)	(1,463)
Deaths	(17)	(168)	(38)	(223)	(3)	(5)	(44)	(52)
Terminations	(68)	(7,917)	(3,822)	(11,807)	(7)	(1,216)	(3,273)	(4,496)
2016 Actives	**3,227**	**119,677**	**33,240**	**156,144**	**967**	**17,242**	**52,706**	**70,915**
2015 Annuitants	50,270	38,693	3,186	92,149	35,239	4,305	7,453	46,997
New Retirees	933	4,448	515	5,896	447	432	1,407	2,286
Annuitant Deaths	(2,253)	(840)	(51)	(3,144)	(1,094)	(61)	(56)	(1,211)
New Survivors	336	298	34	668	199	12	45	256
Other	(18)	(8)	0	(26)	(4)	(1)	(6)	(11)
2016 Annuitants	**49,268**	**42,591**	**3,684**	**95,543**	**34,787**	**4,687**	**8,843**	**48,317**
Ratio Actives to Annuitants	**0.07**	**2.81**	**9.02**	**1.63**	**0.03**	**3.68**	**5.96**	**1.47**

Reconciliation of Participant Data (Continued)				
	SERS			PSERS
	Plan 2	Plan 3	Total	Plan 2
2015 Actives	24,479	31,326	55,805	5,202
Transfers	(252)	3,775	3,523	0
Hires/Rehires	4,340	664	5,004	824
New Retirees	(547)	(624)	(1,171)	(24)
Deaths	(35)	(31)	(66)	(2)
Terminations	(2,035)	(2,796)	(4,831)	(517)
2016 Actives	**25,950**	**32,314**	**58,264**	**5,483**
2015 Annuitants	6,562	5,750	12,312	80
New Retirees	891	985	1,876	29
Annuitant Deaths	(133)	(61)	(194)	(1)
New Survivors	60	35	95	0
Other	0	(1)	(1)	0
2016 Annuitants	**7,380**	**6,708**	**14,088**	**108**
Ratio Actives to Annuitants	**3.52**	**4.82**	**4.14**	**50.77**

Reconciliation of Participant Data (Continued)	LEOFF			WSPRS			All
	Plan 1	Plan 2	Total	Plan 1	Plan 2	Total	Systems
2015 Actives	82	17,019	17,101	560	475	1,035	301,260
Transfers	0	0	0	0	0	0	10,802
Hires/Rehires	1	1,129	1,130	1	25	26	26,647
New Retirees	(20)	(480)	(500)	(55)	0	(55)	(7,172)
Deaths	0	(15)	(15)	(2)	(1)	(3)	(361)
Terminations	(1)	(467)	(468)	(6)	(29)	(35)	(22,154)
2016 Actives	**62**	**17,186**	**17,248**	**498**	**470**	**968**	**309,022**
2015 Annuitants	7,507	3,710	11,217	1,033	0	1,033	163,788
New Retirees	20	561	581	56	0	56	10,724
Annuitant Deaths	(258)	(31)	(289)	(24)	0	(24)	(4,863)
New Survivors	112	25	137	13	0	13	1,169
Other	(3)	(6)	(9)	0	0	0	(47)
2016 Annuitants	**7,378**	**4,259**	**11,637**	**1,078**	**0**	**1,078**	**170,771**
Ratio Actives to Annuitants	**0.01**	**4.04**	**1.48**	**0.46**	**N/A**	**0.90**	**1.81**

Summary of Plan Participants

Summary of Plan Participants								
PERS	2016				2015			
	Plan 1	Plan 2	Plan 3	Total	Plan 1	Plan 2	Plan 3	Total
Active Members								
Number	3,227	119,677	33,240	156,144	3,927	117,768	31,602	153,297
Total Salaries (Dollars in Millions)	$197	$7,570	$1,932	$9,699	$231	$7,205	$1,780	$9,215
Average Age	64.3	48.1	43.3	47.4	63.6	48.3	43.4	47.7
Average Service	25.5	12.4	8.5	11.8	25.3	12.5	8.6	12.0
Average Salary	$61,171	$63,249	$58,110	$62,112	$58,748	$61,176	$56,320	$60,113
Terminated Members								
Number Vested	830	27,430	5,239	33,499	999	26,830	4,961	32,790
Number "Non-Vested"	3,199	104,588	0	107,787	3,373	101,538	0	104,911
Retirees (including L&I disabled)								
Number of Retirees (All)	49,268	42,591	3,684	95,543	50,270	38,693	3,186	92,149
Avg Monthly Benefit, All Retirees	$2,008	$1,517	$867	$1,745	$1,968	$1,435	$823	$1,704
Number of New "Service Retirees"	919	4,333	505	5,757	1,078	3,985	534	5,597
Avg. Bft, New "Service Retirees"	$2,290	$1,975	$1,069	$1,946	$2,216	$1,928	$980	$1,893

Summary of Plan Participants (Continued)								
TRS	2016				2015			
	Plan 1	Plan 2	Plan 3	Total	Plan 1	Plan 2	Plan 3	Total
Active Members								
Number	967	17,242	52,706	70,915	1,353	15,342	52,125	68,820
Total Salaries (Dollars in Millions)	$81	$1,104	$3,947	$5,132	$108	$945	$3,722	$4,775
Average Age	65.3	41.9	46.2	45.4	64.5	42.4	46.2	45.7
Average Service	31.8	7.9	14.0	12.8	31.3	8.4	14.0	13.1
Average Salary	$83,405	$64,055	$74,892	$72,373	$79,603	$61,610	$71,403	$69,381
Terminated Members								
Number Vested	217	2,532	8,718	11,467	267	2,428	8,259	10,954
Number "Non-Vested"	343	5,847	0	6,190	381	5,413	0	5,794
Temporarily Disabled	0	0	0	0	0	0	0	0
Retirees								
Number of Retirees (All)	34,787	4,687	8,843	48,317	35,239	4,305	7,453	46,997
Avg Monthly Benefit, All Retirees	$2,150	$1,864	$1,093	$1,929	$2,122	$1,787	$1,041	$1,920
Number of New "Service Retirees"	445	427	1,393	2,265	536	429	1,344	2,309
Avg. Bft, New "Service Retirees"	$3,081	$2,259	$1,277	$1,816	$3,052	$2,248	$1,257	$1,858

Summary of Plan Participants (Continued)						
SERS	2016			2015		
	Plan 2	Plan 3	Total	Plan 2	Plan 3	Total
Active Members						
Number	25,950	32,314	58,264	24,479	31,326	55,805
Total Salaries (Dollars in Millions)	$817	$1,043	$1,860	$734	$963	$1,697
Average Age	49.9	50.0	50.0	50.2	50.4	50.3
Average Service	9.3	10.3	9.9	9.7	10.6	10.2
Average Salary	$31,493	$32,269	$31,923	$29,998	$30,725	$30,406
Terminated Members						
Number Vested	5,724	7,951	13,675	5,572	7,491	13,063
Number "Non-Vested"	12,205	0	12,205	10,940	0	10,940
Retirees						
Number of Retirees (All)	7,380	6,708	14,088	6,562	5,750	12,312
Avg Monthly Benefit, All Retirees	$859	$467	$672	$836	$454	$658
Number of New "Service Retirees"	869	970	1,839	808	928	1,736
Avg. Bft, New "Service Retirees"	$921	$501	$699	$912	$529	$707

Summary of Plan Participants (Continued)		
PSERS	**2016**	**2015**
	Plan 2	**Plan 2**
Active Members		
Number	5,483	5,202
Total Salaries (Dollars in Millions)	$327	$302
Average Age	40.2	40.3
Average Service	5.7	5.4
Average Salary	$59,700	$58,115
Terminated Members		
Number Vested	393	294
Number "Non-Vested"	1,947	1,694
Retirees		
Number of Retirees (All)	108	80
Avg Monthly Benefit, All Retirees	$584	$486
Number of New "Service Retirees"	27	17
Avg. Bft, New "Service Retirees"	$887	$668

Summary of Plan Participants (Continued)						
LEOFF		**2016**			**2015**	
	Plan 1	**Plan 2**	**Total**	**Plan 1**	**Plan 2**	**Total**
Active Members						
Number	62	17,186	17,248	82	17,019	17,101
Total Salaries (Dollars in Millions)	$7	$1,786	$1,793	$9	$1,743	$1,752
Average Age	64.5	43.5	43.6	63.6	43.6	43.7
Average Service	40.4	14.5	14.6	39.6	14.7	14.8
Average Salary	$108,061	$103,947	$103,962	$106,683	$102,411	$102,431
Terminated Members						
Number Vested	1	953	954	0	785	785
Number "Non-Vested"	31	1,806	1,837	32	1,693	1,725
Retirees						
Number of Retirees (All)	7,378	4,259	11,637	7,507	3,710	11,217
Avg Monthly Benefit, All Retirees	$4,063	$3,726	$3,939	$4,008	$3,529	$3,850
Number of New "Service Retirees"*	20	523	543	41	452	493
Avg. Bft, New "Service Retirees"	$8,065	$4,632	$4,759	$7,980	$4,430	$4,726

**Includes disabled retirees for Plan 1 only.*

Summary of Plan Participants (Continued)						
WSPRS		2016			2015	
	Plan 1	Plan 2	Total	Plan 1	Plan 2	Total
Active Members						
Number	498	470	968	560	475	1,035
Total Salaries (Dollars in Millions)	$47	$36	$83	$49	$33	$82
Average Age	47.5	33.9	40.9	47.0	33.2	40.7
Average Service	20.7	7.4	14.2	20.1	6.5	13.9
Average Salary	$93,338	$77,349	$85,575	$86,535	$70,238	$79,056
Terminated Members						
Number Vested	76	28	104	75	20	95
Number "Non-Vested"	17	53	70	17	33	50
Disabled Members*	46	0	46	48	0	48
Retirees						
Number of Retirees (All)	1,078	0	1,078	1,033	0	1,033
Avg Monthly Benefit, All Retirees	$4,215	$0	$4,215	$4,088	$0	$4,088
Number of New "Service Retirees"	56	0	56	48	0	48
Avg. Bft, New "Service Retirees"	$4,652	$0	$4,652	$4,091	$0	$4,091

**Benefits provided outside of pension funds.*

IV. Appendices

Actuarial Methods and Assumptions

To calculate the contribution rates necessary to pre-fund a plan's benefits, an actuary uses an actuarial cost method, an asset valuation method, economic assumptions, and demographic assumptions. This section, together with the web pages linked below, lists the actuarial methods and assumptions used for this valuation.

Actuarial Methods

Please see the **Actuarial Methods** web page for descriptions of the actuarial cost methods and asset valuation method we use for this valuation.

Actuarial Assumptions

This section lists the assumptions that change regularly, along with new assumption and method changes since the last actuarial valuation report. Please see the **Actuarial Assumptions** web page for descriptions of all remaining assumptions.

Economic Assumptions

We adjust the general salary growth assumption for TRS each year to model the salary bonus payable to members who attain national board certification. These bonuses are includable in compensation for pension purposes.

TRS General Salary Increase by Year

Year	TRS 1	TRS 2/3
2016	3.75%	3.75%
2017	3.75%	3.75%
2018	3.85%	3.85%
2019	3.84%	3.84%
2020	3.83%	3.83%
2021	3.83%	3.82%
2022	3.82%	3.82%
2023	3.81%	3.81%
2024	3.80%	3.80%
2025	3.79%	3.79%
2026	3.78%	3.78%
2027	3.77%	3.77%
2028	3.77%	3.77%
2029+	3.75%	3.75%

Note: Includes inflation.

Demographic Assumptions

The Employee Contribution Rate assumption helps us estimate the value of accumulated employee contributions with interest if a member elects a refund of contributions instead of a deferred retirement allowance upon termination.

Employee Contribution Rates for Savings Fund Accrual

System/Plans	Contribution Rate*
PERS 2	5.42%
TRS 2	6.42%
SERS 2	5.66%
PSERS 2	7.06%
LEOFF 2	8.75%
WSPRS 1/2	7.34%

**PERS 1 and TRS 1 employee rates are set in statute at 6%.*
No LEOFF 1 rates are required as long as the plan remains fully funded.
Plan 3 members do not contribute to the defined benefit plan.

Changes in Methods and Assumptions since the Last Valuation

- For all plans except LEOFF Plan 1, we corrected how we value terminated vested member death benefits. Prior to this correction, we applied factors at the time of termination, rather than at the time of death.
- We updated WSPRS salary assumptions to model legislation signed during the 2016 Legislative Session (C 28 L16). This law includes two, one-time salary increases taking effect on July 1 of 2016 and 2017. The law also requires that future salaries remain competitive with other law enforcement agencies in the state. To reflect this law, we updated our general salary growth assumption to include two, short-term increases of five and approximately eleven percent in 2016 and 2017, respectively; additionally, we used the existing LEOFF service-based salary growth assumption table as a proxy for competitive salary growth.
- We improved how we value the Basic Minimum COLA in PERS Plan 1 and TRS Plan 1 for legal order payees (third party benefit recipients).
- We updated our TRS system growth assumption from 0.80 percent to 1.25 percent, as prescribed by RCW 41.45.035. This change only impacts the calculation of the TRS Plan 1 UAAL rate. See the 2015 Economic Experience Study on our Website for analysis supporting this assumption change.

Summary of Plan Provisions

The summary of key plan provisions used in the actuarial valuation are provided in two sets of tables. The tables below contain plan provisions that can change frequently while the provisions that change less frequently can be found on our website: Summary of General Plan Provisions.

Summary of Frequently Changing Plan Provisions - PERS			
	Plan 1	**Plan 2**	**Plan 3**
COLA	$2.32 per month/YOS* on 7/1/17	Lesser of CPI** or 3%	Lesser of CPI** or 3%
Minimum Benefit per Month	$57.50* per YOS on 7/1/17, $1,844.81* for select annuitants	N/A	N/A
Changes in Plan Provisions Since Last Valuation	None	None	None
Material Benefits not Included in this Valuation	None	Portability with first class cities***	Portability with first class cities***

**Minimum COLA payable to qualified members only; increases by 3% annually. The Uniform COLA was removed under C 362 L 11.*
***CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.*
****Data is not available to assess the amount of liability or whether these portability benefits are material.*

Summary of Frequently Changing Plan Provisions - TRS			
	Plan 1	**Plan 2**	**Plan 3**
COLA	$2.32 per month/YOS* on 7/1/17	Lesser of CPI** or 3%	Lesser of CPI** or 3%
Minimum Benefit per Month	$57.50* per YOS on 7/1/17, $1,844.81* for select annuitants	N/A	N/A
Changes in Plan Provisions Since Last Valuation	None	None	None
Material Benefits not Included in this Valuation	None	None	None

**Minimum COLA payable to qualified members only; increases by 3% annually. The Uniform COLA was removed under C 362 L 11.*
***CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.*

Summary of Frequently Changing Plan Provisions - SERS		
	Plan 2	**Plan 3**
COLA	Lesser of CPI* or 3%	Lesser of CPI* or 3%
Minimum Benefit per Month per YOS	N/A	N/A
Changes in Plan Provisions Since Last Valuation	None	None
Material Benefits not Included in this Valuation	None	None

**CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.*

Summary of Frequently Changing Plan Provision - PSERS	
	Plan 2
COLA	Lesser of CPI* or 3%
Minimum Benefit per Month per YOS	N/A
Changes in Plan Provisions Since Last Valuation	Retroactive Plan Membership Exception, (C 143 L 17)
Material Benefits not Included in this Valuation	None

**CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.*

Summary of Frequently Changing Plan Provisions - LEOFF		
	Plan 1	**Plan 2**
COLA	Full CPI*	Lesser of CPI* or 3%
Minimum Benefit per Month per YOS	N/A	N/A
Changes in Plan Provisions Since Last Valuation	None	Emergency Medical Technician Plan Membership, (C 309 L 17)
Material Benefits not Included in this Valuation	None	None

**CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.*

Summary of Frequently Changing Plan Provision - WSPRS		
	Plan 1	**Plan 2**
COLA	Lesser of CPI* or 3%	Lesser of CPI* or 3%
Minimum Benefit per Month per YOS**	$34.88 on 1/1/17	$34.88 on 1/1/17
Changes in Plan Provisions Since Last Valuation	Revised Definition of Pensionable Overtime, (C 181 L 17)	Revised Definition of Pensionable Overtime, (C 181 L 17)
Material Benefits not Included in this Valuation	None	None

**CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.*

***Amount increases by 3% annually.*

These tables present high-level summaries and are not meant to be exhaustive lists. For complete details of plan provisions, please refer to the statutes governing the systems or contact the plan administrator, DRS. In the unlikely event that information contained in these summary tables conflicts with state law, the law takes precedence.

Age Distributions

Please see the **Age Distributions** webpage for tables summarizing valuation statistics by system, plan, and member/annuitant age.

Historical Data

Please see the **Historical Data** webpage for tables summarizing valuation statistics by retirement system and valuation period.

Glossary

Please see the **Glossary** on our website.

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