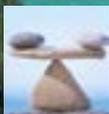


WASHINGTON STATE
2019 ACTUARIAL VALUATION

AUGUST • 2020



**Office of the
State Actuary**

*“Supporting financial
security for generations.”*



Office of the State Actuary

“Supporting financial security for generations.”

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To obtain a copy of this report in alternative format call 360.786.6140 or for TDD 711.

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Office of the State Actuary

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Letter of Introduction Actuarial Valuation Report As of June 30, 2019

August 2020

As required under [Chapter 41.45](#) of the Revised Code of Washington (RCW), this report documents the results of an actuarial valuation of the following Washington State retirement systems. A high-level overview of which employees are covered by each system can be found in the Participant Data section.

- ❖ Public Employees’ Retirement System (PERS).
- ❖ Teachers’ Retirement System (TRS).
- ❖ School Employees’ Retirement System (SERS).
- ❖ Public Safety Employees’ Retirement System (PSERS).
- ❖ Law Enforcement Officers’ and Fire Fighters’ Retirement System (LEOFF).
- ❖ Washington State Patrol Retirement System (WSPRS).

The primary purpose of this valuation is to determine contribution requirements for the systems listed above for the 2021-2023 Biennium based on a June 30, 2019, measurement date and under the funding policy established by the Legislature. 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 and a commentary on risk. The **Actuarial Exhibits** and **Participant Data** sections of the report provide detailed actuarial asset and liability information, participant data, and member occupation information for each system and plan separately. The **Appendices** provide access to a summary of the principal actuarial assumptions and methods, major plan provisions, and additional information used to prepare this valuation.

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.

Sincerely,

Luke Masselink, ASA, EA, MAAA
Senior Actuary

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

I. SUMMARY OF KEY RESULTS

**2019
Actuarial
Valuation
Report**

INTENDED USE

The purpose of this report is to develop contribution rates required to fund the Washington State retirement systems for the 2021-23 Biennium based on a June 30, 2019, 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 [2019 Report on Financial Condition](#) (RFC), which we issue 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.

The information developed in this report does not consider impacts to the systems from the COVID-19 health crisis, which began after the measurement date of June 30, 2019. We have created an [educational page](#) to help interested parties understand how COVID-19 may impact the Washington State retirement systems.

COMMENTARY ON RISK

Actuarial Standards of Practice (ASOP) guide actuaries when performing and communicating their work. [ASOP number 51](#) is specific to communicating risk in defined benefit pension plans, particularly in how actual future measurements may differ significantly from expected future measurements. In the course of developing our actuarial valuation we make hundreds of assumptions, such as the level of returns on future investments, the rate of mortality for retirees, and the number of members contributing to the pension system annually. In some cases, small changes in these assumptions or unexpected plan experience can lead to significant changes in measurements, like the calculation of a plan's contribution rates or the projection of a plan's funded status. This can affect plan risk, and these sensitivities can evolve as the plans grow and mature over time. The Legislature's response to these changes and their action governing the state's pension system also affects plan risk.

To help readers better understand some of these risks and their potential impacts, we have developed a "[Commentary on Risk](#)" webpage which can be found on our website. In the **Actuarial Exhibits** section of this report, we have also included the impact to the total retirement systems' funded status from changes in rates of mortality and mortality improvement, one of our most impactful assumptions. For risk commentary specific to COVID-19, please see our dedicated [educational webpage](#) on potential impacts to the Washington State retirement systems.

CONTRIBUTION RATES

We determine the member and employer contribution rates as a percentage of salary. The summary table to the right shows contribution rates based on the 2019 valuation, along with rates from the previous valuation. Throughout this report, we reconcile how plan experience compared to our assumptions over the valuation year. In doing so, we compare

Calculated Contribution Rates				
	Plan 1		Plans 2/3	
	2019	2018	2019	2018
PERS				
Member*	6.00%	6.00%	6.36%	7.46%
Total Employer	10.07%	11.56%	10.07%	11.56%
TRS				
Member*	6.00%	6.00%	8.05%	8.02%
Total Employer	14.24%	14.51%	14.24%	14.51%
SERS				
Member*	N/A	N/A	7.76%	8.02%
Total Employer	N/A	N/A	11.47%	12.10%
PSERS				
Member	N/A	N/A	6.50%	7.09%
Total Employer	N/A	N/A	10.21%	11.17%
LEOFF				
Member	0.00%	0.00%	7.68%	8.67%
Employer	0.00%	0.00%	4.61%	5.20%
State	0.00%	0.00%	3.07%	3.47%
WSPRS				
Member	8.61%	8.45%	8.61%	8.45%
Employer (State)	18.57%	20.41%	18.57%	20.41%

Note: Employer rates exclude administrative expense rate.

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

I. SUMMARY OF KEY RESULTS

the contribution rates calculated under this valuation against those rates calculated under the 2018 valuation. Please note, however, that the contribution rates expressed for the 2018 valuation were not collected, as that was not a rate-setting year under the current contribution rate-setting cycle. The **Actuarial Exhibits** section of this report shows how we developed the contribution rates for 2019.

No member or employer/state contributions are required for LEOFF 1, as the plan remains fully funded. See [RCW 41.26.080\(2\)](#).

Minimum employer contribution rates adopted by the Legislature for the PERS Plan 1 and the TRS Plan 1 became effective at the beginning of the 2015-17 Biennium. Ignoring recent benefit improvements, both the PERS 1 and TRS 1 employer contribution rates are currently at the minimum rates set in statute. However, the final calculated employer contribution rates for these plans are above the minimum due to the supplemental contribution rate increases for recent benefit enhancements. For more information, please refer to the contribution rate development in the **Actuarial Exhibits** section.

The employer contribution rate for the WSPRS Plans 1/2 excludes the rate smoothing as referenced in the 2019 Legislative Session laws (C 416 L 19, Sec 711(6)). Please see the **Contribution Rate-Setting Cycle** section for the rate adopted by the Pension Funding Council that reflects rate smoothing.

PROJECTED CONTRIBUTION RATES

In addition to calculating contribution rates in this report, we also estimate contribution rates for future biennia based upon projected assets and liabilities. These projected rates can be found on our [website](#). Please note that these projected rates are subject to change based on modifications to plan provisions, assumptions, and the actual experience of the systems.

CONTRIBUTION RATE-SETTING CYCLE

Under current Washington State law, in July of even-numbered years, the Pension Funding Council (PFC) reviews, and may adopt, the basic contribution rates that we calculate. These rates are based on an actuarial valuation performed on asset, participant, and plan information compiled in odd-numbered years. In calculating basic contribution rates, we apply the statutory funding policies described in this section.

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.

For reference, the table to the right compares the member and total employer contribution rates that were adopted by the PFC against the rates that were calculated by the Office of the State Actuary (OSA).

2021-23 Contribution Rates		
	Calculated	Adopted
PERS 1		
Member	6.00%	6.00%
Total Employer	10.07%	10.07%
PERS 2/3		
Member*	6.36%	6.36%
Total Employer	10.07%	10.07%
TRS 1		
Member	6.00%	6.00%
Total Employer	14.24%	14.24%
TRS 2/3		
Member*	8.05%	8.05%
Total Employer	14.24%	14.24%
SERS 2/3		
Member*	7.76%	7.76%
Total Employer	11.47%	11.47%
PSERS 2		
Member	6.50%	6.50%
Total Employer	10.21%	10.21%
LEOFF 1		
Member	0.00%	0.00%
Employer	0.00%	0.00%
State	0.00%	0.00%
LEOFF 2**		
Member	7.68%	8.53%
Employer	4.61%	5.12%
State	3.07%	3.41%
WSPRS 1/2***		
Member	8.61%	8.61%
Employer (State)	18.57%	17.66%

Note: Employer rates exclude administrative expense rate.

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

***The LEOFF 2 Board adopts contribution rates for LEOFF 2. The Board adopted rates equal to 100 percent of the Entry Age Normal Cost. Please see the [2019 LEOFF 2 Actuarial Valuation Report](#) for more information.*

****Adopted employer contribution rate reflects temporary and supplemental smoothing per 2019 Legislative Session Law (C 416 L19 Sec 711(6)).*

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 investment of these contributions is under the direction of the Washington State Investment Board (WSIB). [RCW 43.33A.110](#) requires WSIB to maximize investment returns at a prudent level of risk.

The state's funding policy is found in [Chapter 41.45 RCW](#) — Actuarial Funding of State Retirement Systems. It includes the following goals:

- ❖ 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 WSPRS, as provided by law.
- ❖ Fully amortize the total cost of LEOFF 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 services of those members pay the cost of their 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 LEOFF 2 Board revised their long-term funding policy in 2019 to reduce minimum contribution rates to 90 percent of the Entry Age Normal Cost (EANC) when the plan funded ratio meets or exceeds 105 percent. The minimum rates remain at 100 percent of the EANC when the plan funded ratio is below 105 percent.

The 2019 Legislative Session law (C 416 L 19, Sec 711(6)) intends for the WSPRS employer contribution rates to be smoothed over the 2019-21, 2021-23, and 2023-25 Biennia. The WSPRS calculated contribution rates displayed in this valuation exclude this smoothing policy. The adopted rates reflect information OSA presented to the PFC that incorporates the smoothing policy.

COMMENTS ON 2019 RESULTS

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

CHANGES IN PLAN PROVISIONS

- ❖ A law passed during the 2020 Legislative Session granted a one-time cost-of-living-adjustment for PERS and TRS Plan 1 members. See the **Summary of Plan Provisions** section of this report for more details about this and other plan changes.

CHANGES IN ASSUMPTIONS AND METHODS

- ❖ This valuation reflects updates to the demographic assumptions for all plans consistent with our [2013-18 Demographic Experience Study](#). The impact of the new assumptions varies, with some systems showing an increase in expected future costs while other systems point to lower plan costs. See the **Actuarial Gain/Loss** section for the contribution rate impact from the new assumptions for each system.

I. SUMMARY OF KEY RESULTS

- ❖ The Plan 2/3 results in this valuation now includes liabilities and assets for the Total Allocation Portfolio (TAP) annuities purchased by Plan 3 retirees of PERS, TRS, and SERS. The Plans 2/3 funded ratios and rounded contribution rates were not impacted by this change.

CHANGES IN COVERED POPULATION AND PLAN EXPERIENCE

- ❖ The actual rate of investment return on the Market Value of Assets (MVA) was 8.86 percent and the rate of investment return on the Actuarial Value of Assets (AVA) was 10.67 percent. Both were higher than expected for the valuation year.
- ❖ Salaries grew more than expected for the TRS and SERS retirement systems as a result of collective bargaining agreements adopted in the summer of 2018.
- ❖ The PSERS active population grew by about 26 percent, largely from PERS transfers of nursing and custody staff allowed under expanded PSERS membership provisions enacted in laws of 2018 (C 241 L 18).
- ❖ We observed no other significant changes in the retirement system population.

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 currently assumed valuation interest rate each year, we anticipate 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.

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		
<i>(Dollars in Millions)</i>	2019	2018
All Systems		
Future Value of Fully Projected Benefits	\$767,739	\$705,427
Present Value of Fully Projected Benefits	126,001	117,706
Actuarial Accrued Liability	\$104,020	\$98,061
Valuation Interest Rate*	7.50%	7.50%

*7.40% in LEOFF 2.

ASSETS

The table to the right shows the combined MVA and AVA along with approximate rates of investment return for all the systems combined.

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 number of years over which we smooth depends on the magnitude of the gain or loss. The AVA equals the MVA less the Total Deferred Investment Gains and (Losses) at the valuation date. The AVA can never be less than 70 percent or greater than 130 percent of the MVA.

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

Assets		
(Dollars in Millions)	2019	2018
All Systems		
Market Value of Assets (MVA)	\$100,349	\$92,057
Actuarial Value of Assets (AVA)	95,987	86,855
Member/Employer Contributions	4,088	3,700
Disbursements	4,659	4,620
Investment Return	8,119	8,048
Other	\$58	\$77
MVA Return ¹	8.86%	9.56%
AVA Return ²	10.67%	9.43%

¹ Dollar-weighted rate of return on the MVA, net of expenses.

² The AVA is used in determining contribution rates.

FUNDED STATUS

Funded status is one of many measures that helps explain 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 ratio has one dollar in actuarial assets for each dollar of accrued liability at the valuation date. A plan with a funded ratio 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.

The table to the right 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)	2019	2018
All Systems		
a. Accrued Liability*	\$104,020	\$98,061
b. Market Value of Assets	100,349	92,057
c. Deferred Gains/(Losses)	4,361	5,202
d. Actuarial Value of Assets (b - c)	95,987	86,855
Unfunded Liability (a - d)	\$8,033	\$11,206
Funded Ratio (d / a)	92%	89%

Note: Totals may not agree due to rounding.

*Liabilities valued using Entry Age Normal cost method.

I. SUMMARY OF KEY RESULTS

PARTICIPANT DATA

The table to the right summarizes participant data used in the actuarial valuation for the plan year ending June 30, 2019, 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	2019	2018
Active Members		
Number	330,445	323,491
Total Salaries (<i>in Millions</i>)	\$23,008	\$21,078
Average Annual Salary	\$69,626	\$65,159
Average Attained Age	46.1	46.1
Average Service	10.9	11.1
Retirees and Beneficiaries		
Number	192,866	185,139
Average Annual Benefit	\$13,084	\$12,026
Terminated Members		
Number Vested	63,642	62,373
Number Non-Vested*	142,651	137,195

**Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.*

KEY ASSUMPTIONS

This table displays key economic assumptions used in the actuarial valuation. There were no changes in these assumptions from our prior year's valuation.

Key Assumptions	
All Systems	
Valuation Interest Rate*	7.50%
General Salary Increase	3.50%
Inflation	2.75%
Growth in Membership**	0.95%

**7.40% in LEOFF 2.*

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



II. ACTUARIAL EXHIBITS

**2019
Actuarial
Valuation
Report**



Office of the State Actuary

“Supporting financial security for generations.”

Actuarial Certification Letter Actuarial Valuation Report As of June 30, 2019

August 2020

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 2021-23 Biennium based on a June 30, 2019, 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 if changes occur in the methods, assumptions, plan provisions, or applicable law. The [Risk Assessment](#) page of our website provides further information on the range and likelihood of potential outcomes that vary from expected results. The [Commentary on Risk](#) page of our website provides additional risk education.

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. However, the use of another set of assumptions and methods could also be reasonable and could produce materially different results. Actual results may vary from our expectations.

For all plans with the exception of LEOFF 2, the assumptions used in this valuation for investment return, inflation, salary growth, and membership growth were prescribed by the PFC and are subject to revision by the Legislature. For LEOFF 2, these assumptions are prescribed by the LEOFF 2 Retirement Board. Please see our [2019 Economic Experience Study](#) report for further information on economic assumptions. We developed the demographic assumptions used in this valuation during the [2013-2018 Demographic Experience Study](#). The Legislature prescribed the actuarial cost and asset valuation methods. In our opinion, all 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 audited member and beneficiary data. We checked the data for reasonableness as appropriate based on the purpose of the valuation. WSIB and DRS provided audited financial and asset information. We relied on all the information provided as complete and accurate, however we did adjust



the LEOFF 2 assets to reflect an expected future transfer to the LEOFF 2 Benefit Improvement Account consistent with RCW [41.26.805](#). 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.

The funding method prescribed by the Legislature for PERS 1 and TRS 1 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 member 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).

In order to limit the short-term expected volatility in WSPRS Plans 1/2 employer contribution rate, the Legislature elected to smooth the employer rates over three biennia. The smoothing is expected to result in no expected funding shortfall to WSPRS Plans 1/2 at the end of the three biennia on June 30, 2025.

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,

Luke Masselink, ASA, EA, MAAA
Senior Actuary

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

CONTRIBUTION RATES

Member and Employer Rate Summary				
	Plan 1		Plans 2/3	
	2019	2018	2019	2018
PERS				
Member*	6.00%	6.00%	6.36%	7.46%
Employer (Normal Cost)	6.36%	7.48%	6.36%	7.48%
Employer (Plan 1 UAAL)	3.71%	4.08%	3.71%	4.08%
Total Employer	10.07%	11.56%	10.07%	11.56%
TRS				
Member*	6.00%	6.00%	8.05%	8.02%
Employer (Normal Cost)	8.05%	8.40%	8.05%	8.40%
Employer (Plan 1 UAAL)	6.19%	6.11%	6.19%	6.11%
Total Employer	14.24%	14.51%	14.24%	14.51%
SERS				
Member*	N/A	N/A	7.76%	8.02%
Employer (Normal Cost)	N/A	N/A	7.76%	8.02%
Employer (PERS Plan 1 UAAL)	N/A	N/A	3.71%	4.08%
Total Employer	N/A	N/A	11.47%	12.10%
PSERS				
Member	N/A	N/A	6.50%	7.09%
Employer (Normal Cost)	N/A	N/A	6.50%	7.09%
Employer (PERS Plan 1 UAAL)	N/A	N/A	3.71%	4.08%
Total Employer	N/A	N/A	10.21%	11.17%
LEOFF				
Member	0.00%	0.00%	7.68%	8.67%
Employer	0.00%	0.00%	4.61%	5.20%
State (Normal Cost)	0.00%	0.00%	3.07%	3.47%
State (Plan 1 UAAL)	0.00%	0.00%	0.00%	0.00%
Total State	0.00%	0.00%	3.07%	3.47%
WSPRS				
Member	8.61%	8.45%	8.61%	8.45%
Employer (State)	18.57%	20.41%	18.57%	20.41%

Note: Employer rates exclude administrative expense rate.

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

II. ACTUARIAL EXHIBITS

Development of 2019 Employer/State Rates					
	PERS		TRS		SERS
	Plan 1	Plans 2/3	Plan 1	Plans 2/3	Plans 2/3
a. Total Normal Cost	12.36%	12.72%	14.05%	16.10%	15.52%
b. Member Normal Cost*	6.00%	6.36%	6.00%	8.05%	7.76%
c. Employer Contribution (a - b)	6.36%	6.36%	8.05%	8.05%	7.76%
d. Cost to Amortize UAAL	3.71%	3.71%	6.19%	6.19%	3.71%
e. Total Employer Rate (c + d)	10.07%	10.07%	14.24%	14.24%	11.47%

Note: Employer rates exclude administrative expense rate.

*Plan 3 members do not contribute to the defined benefit plan. TRS 2 member rate may be subject to a member maximum rate.

Development of 2019 Employer/State Rates				
	PSERS	LEOFF		WSPRS
	Plan 2	Plan 1	Plan 2	Plans 1/2
a. Total Normal Cost	13.00%	0.00%	15.36%	27.18%
b. Member Normal Cost*	6.50%	0.00%	7.68%	8.61%
c. Employer Contribution (a - b)	6.50%	0.00%	7.68%	18.57%
d. Cost to Amortize UAAL	3.71%	0.00%	0.00%	N/A
e. Total Employer Rate (c + d)**	10.21%	0.00%	4.61%	18.57%

Note: Employer rates exclude administrative expense rate.

*Plan 3 members do not contribute to the defined benefit plan. WSPRS member rate may be subject to a member maximum rate.

**The state pays 20% of the total normal cost for LEOFF 2. The total employer rate reflected above represents the local government, i.e. non-state, portion.

TRS Plan 2 Maximum Member Contribution Rates					
Valuation Year	Prior Max	Supplemental	New Max	Description	Source
2010 - 2019	8.63%	0.01%	8.64%	AFC protection against reduced salaries.	C 5 L 11
2007 - 2009	8.55%	0.08%	8.63%	Out-of-state service credit purchases.	C 101 L 08
2006	7.76%	0.79%	8.55%	Improved Subsidized ERFs for certain Plan 2/3 members.	C 491 L 07
2005	7.75%	0.01%	7.76%	Lowered vesting requirements for certain Plan 3 members.	C 33 L 06
1999 - 2004	6.59%	1.16%	7.75%	Subsidized ERFs for Plan 2/3 members.	C 247 L 00
1997 - 1998	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	New Max	Description	Source
2019	8.45%	0.16%	8.61%	Modified the definition of "Veteran" and leave cash-out as pensionable salary.	C 97 L 20
2017 - 2018	8.44%	0.01%	8.45%	Modified the definition of "Veteran".	C 61 L 18
2016*	7.68%	0.76%	8.44%	Expanded the definition of pensionable overtime.	C 181 L 17
	7.34%	0.34%	7.68%		
2014 - 2015	7.19%	0.15%	7.34%	L&I duty-related death benefits paid from pension trust fund on remarriage.	C 78 L 15
2009 - 2013	7.18%	0.01%	7.19%	Increased duty-related death benefits.	C 261 L 10
2008	6.95%	0.23%	7.18%	Survivor benefits for registered domestic partners.	C 522 L 09
2006** - 2007	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.

*This law stipulated a phased increase to the member maximum rate by applying 0.34% in Fiscal Year 2018 and 0.76% in Fiscal Year 2019.

**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).



II. ACTUARIAL EXHIBITS

The following table compares the member and total employer contribution rates that were adopted by the PFC against the rates that were calculated by OSA. Note the 2019-21 adopted rates we display include the supplemental rates charged following the 2019 Legislative Session.

Contribution Rates			
	2019-21 Adopted ¹	2021-23 Calculated	2021-23 Adopted
PERS 1			
Member	6.00%	6.00%	6.00%
Total Employer	12.68%	10.07%	10.07%
PERS 2/3			
Member ²	7.90%	6.36%	6.36%
Total Employer	12.68%	10.07%	10.07%
TRS 1			
Member	6.00%	6.00%	6.00%
Total Employer	15.33%	14.24%	14.24%
TRS 2/3			
Member ²	7.77%	8.05%	8.05%
Total Employer	15.33%	14.24%	14.24%
SERS 2/3			
Member ²	8.25%	7.76%	7.76%
Total Employer	13.01%	11.47%	11.47%
PSERS 2			
Member	7.20%	6.50%	6.50%
Total Employer	11.96%	10.21%	10.21%
LEOFF 1			
Member	0.00%	0.00%	0.00%
Employer	0.00%	0.00%	0.00%
State	0.00%	0.00%	0.00%
LEOFF 2³			
Member	8.59%	7.68%	8.53%
Employer	5.15%	4.61%	5.12%
State	3.44%	3.07%	3.41%
WSPRS 1/2⁴			
Member	8.45%	8.61%	8.61%
Employer (State)	17.50%	18.57%	17.66%

Employer rates exclude administrative expense rate.

¹ 2019-21 adopted rates include 2019 Session supplemental rate.

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

³ The LEOFF 2 Board adopts contribution rates for LEOFF 2. The Board adopted rates equal to 100 percent of the Entry Age Normal Cost. Please see the [2019 LEOFF 2 Actuarial Valuation Report](#) for more information.

⁴ Adopted employer contribution rate reflects temporary and supplemental smoothing policy per 2019 Legislative Session Law (C 416 L19 Sec 711(6)).

The tables on the following pages show the development of the normal cost rates and the Plan 1 UAAL rates. Consistent with current funding policy, the normal cost rates include minimum contribution rates to provide stable and adequate contribution rates over time. These minimum rates are a percent of the normal cost calculated under the EAN funding method. The percent is 70 percent for WSPRS Plans 1 and 2, 100 percent for LEOFF 2 (which reduces to 90 percent when the plan's funded ratio is at least 105 percent), and 80 percent for all other plans.

The PERS 1 and TRS 1 UAAL, under current funding policy, must be amortized over a rolling ten-year period, as a level percentage of projected system payroll. All employers of PERS, SERS, and PSERS members contribute toward the PERS 1 UAAL, while all employers of TRS members contribute toward the TRS 1 UAAL. UAAL rates also include minimum contribution rates to ensure complete amortization of the UAAL. The minimum UAAL rate is 3.50 percent in PERS 1 and 5.75 percent in TRS 1. Please see the [Glossary](#) for a more detailed explanation of EAN and UAAL.

The funded ratio for LEOFF 2 is currently above 105 percent and therefore the minimum contribution rate is 90 percent of the EANC rate based on Board policy.

We provide additional 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. Calculated Member Normal Cost Rate			
a. Future Value of Fully Projected Benefits	\$316,203	\$208,149	\$48,545
b. Present Value of Fully Projected Benefits	51,592	23,168	8,096
c. Valuation Assets	40,766	15,311	5,872
d. Unfunded Fully Projected Benefits (b - c)	10,826	7,857	2,224
e. Past Liability Balance	3	37	0
f. Adjusted Unfunded (d - e)	\$10,823	\$7,820	\$2,224
Present Value of Projected Salaries to Current Members (PVS)			
g. Plan 1 PVS	N/A	N/A	N/A
h. Plan 2 PVS	73,788	21,933	8,867
i. Plan 3 PVS	22,565	53,253	10,926
j. Weighted PVS (2g + 2h + i)	\$170,140	\$97,120	\$28,660
k. Member Normal Cost (f / j)	6.36%	8.05%	7.76%
l. Member Minimum Contribution Rate	4.37%	5.33%	4.72%
m. Prior Year Member Maximum Contribution Rate	N/A	8.64%	N/A
n. Member Contribution Rate with Max/Min	6.36%	8.05%	7.76%
o. Change In Plan Provisions (Laws of 2020)	0.00%	0.00%	0.00%
p. Calculated Member Contribution Rate (n + o)*	6.36%	8.05%	7.76%
2. Calculated Employer Normal Cost Rate			
a. Present Value of Fully Projected Benefits	\$51,592	\$23,168	\$8,096
b. Valuation Assets	40,766	15,311	5,872
c. Unfunded Benefits (a - b)	10,826	7,857	2,224
d. Present Value of Member Contributions	4,694	1,766	688
e. Past Liability Balance**	3	37	0
f. Employer Responsibility (c - d - e)	\$6,129	\$6,054	\$1,536
Present Value of Projected Salaries to Current Members (PVS)			
g. Plan 1 PVS	N/A	N/A	N/A
h. Plan 2 PVS	73,788	21,933	8,867
i. Plan 3 PVS	22,565	53,253	10,926
j. Total PVS (g + h + i)	\$96,352	\$75,187	\$19,793
k. Employer Normal Cost (f / j)	6.36%	8.05%	7.76%
l. Employer Minimum Contribution Rate	4.37%	5.33%	4.72%
m. Employer Contribution Rate with Minimum	6.36%	8.05%	7.76%
n. Excess Employer Rate	N/A	0.00%	N/A
o. Rate to Amortize Past Liability Balance**	0.00%	0.00%	0.00%
p. Change In Plan Provisions (Laws of 2020)	0.00%	0.00%	0.00%
q. Calculated Employer Contribution Rate (m + n + o + p)	6.36%	8.05%	7.76%
3. Adopted Normal Cost Rates for 2021-2023			
a. Member Contribution Rate	6.36%	8.05%	7.76%
b. Employer Contribution Rate	6.36%	8.05%	7.76%
c. State Contribution Rate	N/A	N/A	N/A
d. Total Contribution Rate (a + b + c)	12.72%	16.10%	15.52%

Note: Totals may not agree due to rounding.

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

**Past liabilities are expected to be paid off when contribution rates are effective in 2021-23 Biennium.

II. ACTUARIAL EXHIBITS

Development of Normal Cost Rates <i>(Continued)</i>			
<i>(Dollars in Millions)</i>	PSERS 2	LEOFF 2	WSPRS 1/2
1. Calculated Member Normal Cost Rate			
a. Future Value of Fully Projected Benefits	\$16,600	\$118,647	\$9,160
b. Present Value of Fully Projected Benefits	1,391	16,095	1,586
c. Valuation Assets ¹	690	13,294	1,301
d. Unfunded Fully Projected Benefits (b - c)	701	2,802	285
e. Past Liability Balance	0	0	6
f. Adjusted Unfunded (d - e)	\$701	\$2,802	\$279
Present Value of Projected Salaries to Current Members (PVS)			
g. Plan 1 PVS	N/A	N/A	\$ 238
h. Plan 2 PVS	5,390	24,130	854
i. Plan 3 PVS	N/A	N/A	N/A
j. Weighted PVS (2g + 2h + i)	\$10,779	\$48,260	\$2,184
k. Member Normal Cost (f / j)	6.50%	5.81%	12.77%
l. Member Minimum Contribution Rate	5.51%	7.68%	7.31%
m. Prior Year Member Maximum Contribution Rate	N/A	N/A	8.45%
n. Member Contribution Rate with Max/Min	6.50%	7.68%	8.45%
o. Change In Plan Provisions (Laws of 2020)	0.00%	0.00%	0.16%
p. Calculated Member Contribution Rate (n + o)	6.50%	7.68%	8.61%
2. Calculated Employer Normal Cost Rate			
a. Present Value of Fully Projected Benefits	\$1,391	\$16,095	\$1,586
b. Valuation Assets ¹	690	13,294	1,301
c. Unfunded Benefits (a - b)	701	2,802	285
d. Present Value of Member Contributions	351	1,401	139
e. Past Liability Balance	0	0	6
f. Employer Responsibility (c - d - e)	\$351	\$1,401	\$139
Present Value of Projected Salaries to Current Members (PVS)			
g. Plan 1 PVS	N/A	N/A	\$ 238
h. Plan 2 PVS	5,390	24,130	854
i. Plan 3 PVS	N/A	N/A	N/A
j. Total PVS (g + h + i)	\$5,390	\$24,130	\$1,092
k. Employer Normal Cost (f / j)	6.50%	5.81%	12.77%
l. Employer Minimum Contribution Rate	5.51%	7.68%	7.31%
m. Employer Contribution Rate with Minimum	6.50%	7.68%	12.77%
n. Excess Employer Rate	N/A	N/A	4.32%
o. Rate to Amortize Past Liability Balance ²	N/A	N/A	1.32%
p. Change In Plan Provisions (Laws of 2020)	0.00%	0.00%	0.16%
q. Calculated Employer Contribution Rate (m + n + o + p)	6.50%	7.68%	18.56%
3. Adopted Normal Cost Rates for 2021-23³			
a. Member Contribution Rate	6.50%	8.53%	8.61%
b. Employer Contribution Rate	6.50%	5.12%	17.66%
c. State Contribution Rate	N/A	3.41%	N/A
d. Total Contribution Rate (a + b + c)	13.00%	17.06%	26.27%

Note: Totals may not agree due to rounding.

¹ LEOFF 2's assets for 2019 exclude the \$22 million held in the LEOFF 2 BIA and have been further reduced by \$300 million payable to the BIA effective 7/1/2019 (C 366 L 19).

² WSPRS liability is attributable to past costs for improved survivor benefits.

³ LEOFF 2 rates adopted by LEOFF 2 Board; all others adopted by the PFC. LEOFF 2 rate: 50% Member, 30% Employer, 20% State.

Amortization of the Plan 1 Unfunded Actuarial Accrued Liability (UAAL)			
<i>(Dollars in Millions)</i>	PERS 1	TRS 1	LEOFF 1
a. Future Value of Fully Projected Benefits	\$24,134	\$17,306	\$8,997
b. Present Value of Fully Projected Benefits (PVFB)	11,445	8,283	4,077
c. Valuation Assets	7,461	5,558	5,734
d. Actuarial Present Value of Future Normal Costs	40	11	0
e. Balance of Plan 1 Benefit Improvements ¹	185	134	N/A
f. UAAL (b - c - d - e)	\$3,759	\$2,580	(\$1,657)
g. Amortization Date	N/A	N/A	6/30/2024
h. Present Value of Projected Salaries ²	\$127,043	\$62,008	\$6,017
i. Contribution Rate Before Adjustments (f / h)	2.96%	4.16%	(27.53%)
j. Minimum Contribution Rate	3.50%	5.75%	N/A
k. Preliminary Contribution Rate	3.50%	5.75%	(27.53%)
l. Plan 1 Benefit Improvements	0.10%	0.21%	N/A
m. Change In Plan Provisions (Laws of 2020)	0.11%	0.23%	0.00%
n. Calculated Plan 1 UAAL Contribution Rates (k + l + m)³	3.71%	6.19%	(27.53%)
Adopted UAAL Contribution Rates for 2021-2023	3.71%	6.19%	0.00%

Note: Totals may not agree due to rounding.

¹ As stated in RCW 41.45.060, the cost of funding Plan 1 benefit improvements shall be amortized over a fixed 10-year period.

² Measured under the plan's amortization method.

³ No LEOFF 1 UAAL contributions are required when the plan is fully funded under current methods and assumptions.



ACTUARIAL LIABILITIES

Present Value of Fully Projected Benefits							
(Dollars in Millions)	PERS			TRS			SERS
	Plan 1	Plans 2/3	Total	Plan 1	Plans 2/3	Total	Plans 2/3
Active Members							
Retirement	\$518	\$28,383	\$28,901	\$188	\$13,566	\$13,754	\$4,239
Termination	0	3,295	3,295	0	2,979	2,979	704
Death	3	169	172	1	95	96	30
Disability	0	118	118	0	36	36	19
ROC ¹ on Termination	0	500	500	0	66	66	62
ROC ¹ on Death	5	183	189	1	29	31	17
Total Active	\$527	\$32,648	\$33,175	\$190	\$16,772	\$16,961	\$5,071
Inactive Members							
Terminated Vested	\$65	\$3,264	\$3,329	\$19	\$1,224	\$1,243	\$755
Terminated Non-Vested ²	7	316	323	3	61	63	39
Service Retired ³	10,031	14,552	24,583	7,620	4,573	12,193	2,044
Disability Retired	96	152	248	70	13	83	18
Survivors	719	497	1,216	382	95	476	56
TAP Annuities	0	164	164	0	431	431	112
Total Inactive	\$10,919	\$18,944	\$29,863	\$8,093	\$6,396	\$14,489	\$3,025
Laws of 2020	130	1	131	132	0	132	0
2019 Total	\$11,575	\$51,593	\$63,168	\$8,415	\$23,168	\$31,583	\$8,096
2018 Total	\$11,999	\$48,354	\$60,353	\$8,598	\$19,837	\$28,436	\$7,109

Note: Totals may not agree due to rounding.

¹ Return of Contributions.

² Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

³ Includes liability from individuals who are entitled to a portion of the primary member's benefit (legal order payees).



Present Value of Fully Projected Benefits (Continued)						
(Dollars in Millions)	PSERS	LEOFF			WSPRS	Total
	Plan 2	Plan 1	Plan 2	Total	Plans 1/2	
Active Members						
Retirement	\$1,069	\$25	\$10,001	\$10,027	\$636	\$58,626
Termination	154	0	169	169	5	7,306
Death	4	0	110	110	4	416
Disability	9	0	543	543	1	726
ROC ¹ on Termination	41	0	111	111	3	783
ROC ¹ on Death	8	0	83	83	2	329
Total Active	\$1,285	\$25	\$11,018	\$11,044	\$649	\$68,185
Inactive Members						
Terminated Vested	\$44	\$1	\$250	\$252	\$20	\$5,643
Terminated Non-Vested ²	17	0	16	16	1	459
Service Retired ³	43	1,823	4,398	6,221	837	45,922
Disability Retired	2	1,538	281	1,819	4	2,172
Survivors	1	690	132	822	74	2,646
TAP Annuities	0	0	0	0	0	707
Total Inactive	\$106	\$4,052	\$5,077	\$9,129	\$936	\$57,549
Laws of 2020	0	0	1	1	3	267
2019 Total	\$1,391	\$4,077	\$16,096	\$20,173	\$1,589	\$126,001
2018 Total	\$1,349	\$4,096	\$14,846	\$18,942	\$1,517	\$117,706

Note: Totals may not agree due to rounding.

¹ Return of Contributions.

² Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

³ Includes liability from individuals who are entitled to a portion of the primary member's benefit (legal order payees).



II. ACTUARIAL EXHIBITS

Entry Age Normal Accrued Liability ¹					
(Dollars in Millions)	PERS		TRS		SERS
	Plan 1	Plans 2/3	Plan 1	Plans 2/3	Plans 2/3
Active Members					
Retirement	\$485	\$21,726	\$179	\$8,765	\$3,081
Termination	(6)	1,853	(1)	1,662	348
Death	2	122	0	62	21
Disability	0	54	0	12	7
ROC ² on Termination	(0)	(214)	(0)	(25)	(16)
ROC ² on Death	5	114	1	11	9
Total Active	\$486	\$23,656	\$180	\$10,486	\$3,449
Inactive Members					
Terminated Vested	\$65	\$3,264	\$19	\$1,224	\$755
Terminated Non-Vested ³	7	316	3	61	39
Service Retired ⁴	10,031	14,552	7,620	4,573	2,044
Disability Retired	96	152	70	13	18
Survivors	719	497	382	95	56
TAP Annuities	0	164	0	431	112
Total Inactive	\$10,919	\$18,944	\$8,093	\$6,396	\$3,025
Laws of 2020	130	(0)	132	0	0
2019 Total	\$11,535	\$42,600	\$8,405	\$16,883	\$6,474
2018 Total	\$11,942	\$40,024	\$8,583	\$14,705	\$5,748

Note: Totals may not agree due to rounding.

¹ Calculated using the EAN cost method. This method is used in the funded ratio calculation and is not used to determine contribution requirements.

² Return of Contributions.

³ Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

⁴ Includes liability from individuals who are entitled to a portion of the primary member's benefit (legal order payees).

Some line items in the Entry Age Normal (EAN) accrued liability tables are negative. This is a result of how these benefits are accrued, over a member's working career, under the EAN actuarial cost method. The accrued liability for a given benefit provision is the difference between (1) today's value of all future benefits for that benefit definition and (2) how much of those future benefits are assumed to be accrued over the rest of the member's career. Item (1) is essentially split into annual "pieces" that are spread evenly across a career from first hire date to last assumed exit. Item (2) is how many more "pieces" they have left to accrue. For benefits like "Return On Contributions (ROC) on Termination", while we assume members that are eligible for retirement will no longer elect an ROC benefit when they exit the system, they are still accruing the level piece of item (2) each year until they retire. So in this instance, item (1) is zero but item (2) is positive. This means we get a negative number when subtracting item (2) from item (1).

Please note GASB mandates this methodology for the accrued liability calculation in financial reporting. We use the same methods in this report – a funding valuation – for easier comparison with financial reporting results. An alternative method is to calculate the accrued liability through the date last eligible for the benefit instead of the end of career. This would eliminate the negative accrued liability components seen above.

Entry Age Normal Accrued Liability ¹ (Continued)					
(Dollars in Millions)	PSERS	LEOFF		WSPRS	Total
	Plan 2	Plan 1	Plan 2	Plans 1/2	
Active Members					
Retirement	\$519	\$25	\$6,569	\$429	\$41,776
Termination	58	0	28	1	3,943
Death	2	0	14	1	224
Disability	3	0	291	0	368
ROC ² on Termination	(7)	0	(33)	(0)	(296)
ROC ² on Death	3	0	47	1	192
Total Active	\$578	\$25	\$6,914	\$431	\$46,206
Inactive Members					
Terminated Vested	\$44	\$1	\$250	\$20	\$5,643
Terminated Non-Vested ³	17	0	16	1	459
Service Retired ⁴	43	1,823	4,398	837	45,922
Disability Retired	2	1,538	281	4	2,172
Survivors	1	690	132	74	2,646
Tap Annuities	0	0	0	0	707
Total Inactive	\$106	\$4,052	\$5,077	\$936	\$57,549
Laws of 2020	0	0	0	2	265
2019 Total	\$685	\$4,077	\$11,992	\$1,370	\$104,020
2018 Total	\$596	\$4,095	\$11,066	\$1,302	\$98,061

Note: Totals may not agree due to rounding.

¹ Calculated using the EAN cost method. This method is used in the funded ratio calculation and is not used to determine contribution requirements.

² Return of Contributions.

³ Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

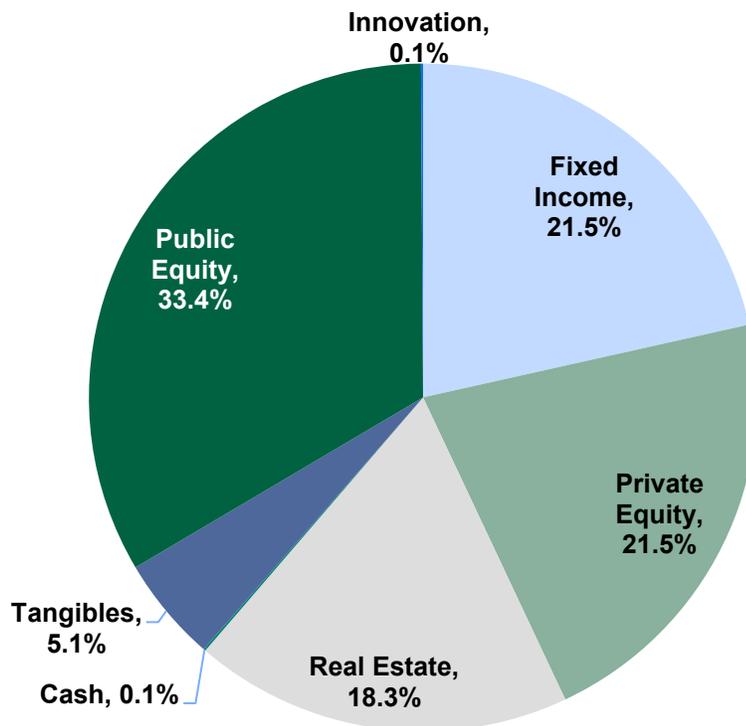
⁴ Includes liability from individuals who are entitled to a portion of the primary member's benefit (legal order payees).

We report the present and future value of benefit payments by year and by plan on our website. We also show how the present value of these benefit payments varies 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



Source: Washington State Investment Board.

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.

Each asset class is unique in terms of expected return, standard deviation, and correlation to other asset classes. Please see page 45 of the [2019 Economic Experience Study](#) for more information.

In the asset tables that follow, LEOFF 2's MVA and AVA exclude \$22.0 million held in the LEOFF 2 BIA, and have been further reduced by \$300 million payable to the BIA effective July 1, 2019 (C 366 L19). Under RCW 41.26.805, assets held in the BIA are not included when calculating contribution rates.

Change in Market Value of Assets					
<i>(Dollars in Millions)</i>	PERS		TRS		SERS
	Plan 1	Plans 2/3*	Plan 1	Plans 2/3*	Plans 2/3*
	Fund 631	Fund 641	Fund 632	Fund 642	Fund 633
2018 Market Value	\$7,677	\$38,685	\$5,802	\$13,973	\$5,421
Revenue					
Member Contributions	\$7	\$642	\$2	\$120	\$80
Employer/State Contributions	726	820	501	524	201
Total Contributions	734	1,462	503	644	280
Investment Return	641	3,440	480	1,256	486
Restorations**	3	27	1	5	1
Transfers In	0	1	0	1	0
Miscellaneous	0	0	0	0	0
Total Revenue	\$1,377	\$4,929	\$984	\$1,905	\$767
Disbursements					
Monthly Benefits	\$1,199	\$1,196	\$905	\$355	\$176
Refunds	4	48	1	4	5
Total Benefits	1,203	1,244	906	359	181
Transfers Out	0	4	0	3	2
Expenses	0	1	0	0	0
Payables	0	0	0	0	0
Total Disbursements	\$1,203	\$1,249	\$906	\$362	\$183
2019 Market Value	\$7,851	\$42,365	\$5,880	\$15,516	\$6,005
Adjustments to Market Value***	\$0	\$166	\$0	\$427	\$113
2019 Adjusted Market Value (MV)	\$7,851	\$42,532	\$5,880	\$15,943	\$6,118
2019 Actuarial Value (AV)	\$7,461	\$40,766	\$5,558	\$15,311	\$5,872
Ratio (AV / MV)	95%	96%	95%	96%	96%

Note: Totals may not agree due to rounding.

*Excludes defined contribution portion of Plan 3 assets.

**Includes additional annuity purchases and service credit purchases.

***Adjustment reflects TAP assets for Plan 3 retirees and LEOFF 2 BIA asset transfer.

II. ACTUARIAL EXHIBITS

Change in Market Value of Assets <i>(Continued)</i>					
<i>(Dollars in Millions)</i>	PSERS	LEOFF		WSPRS	Total
	Plan 2	Plan 1	Plan 2	Plans 1/2	
	Fund 635	Fund 819	Fund 829	Fund 615	
2018 Market Value*	\$601	\$5,903	\$12,985	\$1,289	\$92,336
Revenue					
Contributions					
Member	33	0	188	9	\$1,081
Employer/State	32	0	189	15	3,008
Total Contributions	65	0	377	23	4,088
Investment Return	57	495	1,154	111	8,119
Restorations**	0	0	16	2	55
Transfers In	0	0	0	1	3
Miscellaneous	0	0	0	0	0
Total Revenue	\$123	\$495	\$1,547	\$137	\$12,265
Disbursements					
Monthly Benefits	\$3	\$369	\$305	\$64	\$4,572
Refunds	4	0	9	0	75
Total Benefits	7	369	314	64	4,647
Transfers Out	0	0	0	0	9
Expenses	0	0	2	0	4
Payables	0	0	0	0	0
Total Disbursements	\$7	\$369	\$316	\$65	\$4,659
2019 Market Value	\$717	\$6,029	\$14,216	\$1,362	\$99,942
Adjustments to Market Value***	\$0	\$0	(\$300)	\$0	\$406
2019 Adjusted Market Value (MV)	\$717	\$6,029	\$13,916	\$1,362	\$100,349
2019 Actuarial Value (AV)	\$690	\$5,734	\$13,294	\$1,301	\$95,987
Ratio (AV / MV)	96%	95%	96%	95%	96%

Note: Totals may not agree due to rounding.

*Due to adjustments from the expected BIA asset transfer, the 2018 MVA for LEOFF 2 in the table above does not match the 2018 MVA for LEOFF 2 in the 2018 Actuarial Valuation Report.

**Includes additional annuity purchases and service credit purchases.

***Adjustment reflects TAP assets for Plan 3 retirees and LEOFF 2 BIA asset transfer.



Calculation of Actuarial Value of Assets							
<i>(Dollars in Millions)</i>			PERS 1	PERS 2/3	TRS 1	TRS 2/3	SERS 2/3
a. Adjusted Market Value at 6/30/2019			\$7,851	\$42,532	\$5,880	\$15,943	\$6,118
Deferred Gains and (Losses)							
Plan Year Ending	Smoothing Period	Years Remaining					
6/30/2019	2	1	44	270	32	101	39
6/30/2018	3	1	\$49	\$241	\$37	\$87	\$34
6/30/2017	7	4	239	1,119	203	398	155
6/30/2016	6	2	(134)	(517)	(107)	(181)	(71)
6/30/2014	8	2	191	653	157	226	89
b. Total Deferral			\$390	\$1,765	\$322	\$632	\$246
c. Market Value less Deferral (a - b)			\$7,461	\$40,766	\$5,558	\$15,311	\$5,872
d. 70% of Market Value of Assets			\$5,496	\$29,772	\$4,116	\$11,160	\$4,283
e. 130% of Market Value of Assets			\$10,207	\$55,291	\$7,644	\$20,725	\$7,954
f. Actuarial Value of Assets*			\$7,461	\$40,766	\$5,558	\$15,311	\$5,872

Note: Totals may not agree due to rounding. The gain/(loss) for 6/30/2015 has been fully realized for all plans.

*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							
<i>(Continued)</i>							
<i>(Dollars in Millions)</i>			PSERS 2	LEOFF 1	LEOFF 2	WSPRS 1/2	Total
a. Adjusted Market Value at 6/30/2019			\$717	\$6,029	\$13,916	\$1,362	\$100,349
Deferred Gains and (Losses)							
Plan Year Ending	Smoothing Period	Years Remaining					
6/30/2019	2	1	5	34	97	8	629
6/30/2018	3	1	4	38	85	8	583
6/30/2017	7	4	15	186	387	39	2,742
6/30/2016*	6,5	2,1	(4)	(99)	(166)	(20)	(1,299)
6/30/2014	8	2	7	137	219	26	1,706
b. Total Deferral			\$27	\$295	\$623	\$62	\$4,361
c. Market Value less Deferral (a - b)			\$690	\$5,734	\$13,294	\$1,301	\$95,987
d. 70% of Market Value of Assets			\$502	\$4,220	\$9,742	\$954	\$70,244
e. 130% of Market Value of Assets			\$932	\$7,837	\$18,091	\$1,771	\$130,453
f. Actuarial Value of Assets**			\$690	\$5,734	\$13,294	\$1,301	\$95,987

Note: Totals may not agree due to rounding. The gain/(loss) for 6/30/2015 has been fully realized for all plans.

*PSERS 2 = 5 year smoothing period, 1 year remaining; all other plans = 6 year smoothing period, 2 years remaining.

**Actuarial Value of Assets can never be less than 70% or greater than 130% of the Market Value of Assets.

II. ACTUARIAL EXHIBITS

Investment Gains and (Losses) for Prior Year					
(Dollars in Millions)	PERS 1	PERS 2/3*	TRS 1	TRS 2/3*	SERS 2/3*
a. 2018 Market Value**	\$7,633	\$38,640	\$5,775	\$13,958	\$5,408
b. Total Cash Flow	(475)	238	(415)	289	99
c. 2019 Market Value**	7,800	42,325	5,841	15,506	5,994
d. Actual Return (c - b - a)	\$642	\$3,447	\$481	\$1,260	\$487
e. Weighted Asset Amount	\$7,393	\$38,764	\$5,561	\$14,099	\$5,456
f. Expected Return (7.5% x e)	554	2,907	417	1,057	409
g. Investment Gain/(Loss) for Prior Year (d - f)	88	540	64	202	78
h. Dollar-Weighted Rate of Return**	8.68%	8.89%	8.65%	8.93%	8.93%

Note: Totals may not agree due to rounding.

*Excludes defined contribution portion of Plan 3 assets.

**Source: Washington State Investment Board.

Investment Gains and (Losses) for Prior Year (Continued)					
(Dollars in Millions)	PSERS 2	LEOFF 1	LEOFF 2	WSPRS	Total
a. 2018 Market Value*	\$600	\$5,902	\$12,942	\$1,288	\$92,145
b. Total Cash Flow	59	(370)	64	(39)	(550)
c. 2019 Market Value*	715	6,028	14,159	1,361	99,729
d. Actual Return (c - b - a)	\$57	\$496	\$1,154	\$111	\$8,135
e. Weighted Asset Amount	\$627	\$5,720	\$12,974	\$1,269	\$91,864
f. Expected Return (7.5% x e)**	47	429	960	95	6,877
g. Investment Gain/(Loss) for Prior Year (d - f)	10	67	193	16	1,258
h. Dollar-Weighted Rate of Return*	9.12%	8.67%	8.89%	8.77%	8.86%

Note: Totals may not agree due to rounding.

*Source: Washington State Investment Board.

**The expected return for LEOFF 2 is (7.4% x e).

FUNDED STATUS

In our actuarial valuation report, we calculate a plan's funded status by comparing the plan's current assets, determined under an asset valuation method, to 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](#) on our website for an explanation of the actuarial cost methods we use in this actuarial valuation.

Consistent with financial reporting under GASB requirements, we report funded status using the EAN actuarial cost method. However, the funded status measures we share in this report may still vary from those presented in the [DRS Comprehensive Annual Financial Report](#). These differences occur because the assumptions and methods applied to determine contribution requirements (under a funding valuation) may not apply for financial reporting under GASB accounting standards (an accounting valuation). Put another way, these measurements are used 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. This rate is intended to be consistent with the long-term expected return under the

plan’s funding policy. For all plans, with the exception of LEOFF 2, the valuation interest rate is prescribed by the PFC and is subject to revision by the Legislature. For LEOFF 2, the valuation interest rate is prescribed by the LEOFF 2 Retirement Board. (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 that we use to determine 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 AVA. This asset valuation method smooths the inherent volatility in the 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 2019 investment gains or losses, we used an investment return assumption of 7.5 percent (7.4 percent for LEOFF 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 following table. For the actuarial value basis, we use the assumed long-term rate of return and AVA 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.

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

Funded Status on an Actuarial Value Basis*					
(Dollars in Millions)	PERS		TRS		SERS
	Plan 1	Plans 2/3	Plan 1	Plans 2/3	Plan 2/3
Accrued Liability	\$11,535	\$42,600	\$8,405	\$16,883	\$6,474
Valuation Assets	\$7,461	\$40,766	\$5,558	\$15,311	\$5,872
Unfunded Liability	\$4,074	\$1,833	\$2,847	\$1,572	\$602
Funded Ratio					
2019	65%	96%	66%	91%	91%
2018	60%	91%	63%	90%	89%
2017	57%	89%	60%	91%	88%
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 7.5%. All assets have been valued under the actuarial asset method.

Funded Status on an Actuarial Value Basis*					
(Dollars in Millions)	(Continued)				
	PSERS	LEOFF		WSPRS	Total
	Plan 2	Plan 1	Plan 2	Plans 1/2	
Accrued Liability	\$685	\$4,077	\$11,992	\$1,370	\$104,020
Valuation Assets	\$690	\$5,734	\$13,294	\$1,301	\$95,987
Unfunded Liability	(\$6)	(\$1,657)	(\$1,302)	\$70	\$8,033
Funded Ratio					
2019	101%	141%	111%	95%	92%
2018	96%	135%	108%	93%	89%
2017	95%	131%	109%	92%	86%
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 7.5% (7.4% for LEOFF 2). All assets have been valued under the actuarial asset method.

II. ACTUARIAL EXHIBITS

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 1 has sufficient assets to cease ongoing contributions.

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

The funded status depends on numerous assumptions. Two of the most significant assumptions are the mortality rates, which estimate how long we expect members to live, and the interest rate or expected return on plan assets. A key component of the mortality assumption is the rate at which mortality is expected to improve in the future. To show this, we doubled the current mortality improvement assumption, i.e., longer lifespans than our best estimate, and assumed no future improvements, shorter lifespans than our best estimate. The tables below demonstrate how the funded status changes across all retirement systems if we alter these assumptions. Please see our [Commentary on Risk](#) webpage for individual system results.

Sensitivity of Funded Ratios to Mortality Rates			
(Dollars in Millions)	No Mortality Improvement	Best Estimate Mortality	Double Mortality Improvement
Accrued Liability	\$98,162	\$104,020	\$109,934
Valuation Assets	\$95,987	\$95,987	\$95,987
Unfunded Liability	\$2,175	\$8,033	\$13,947
Funded Ratio	98%	92%	87%

Sensitivity of Funded Ratios to Interest Rates*			
(Dollars in Millions)	1% Lower 6.5%	Best Estimate 7.5%	1% Higher 8.5%
Accrued Liability	\$117,947	\$104,020	\$92,492
Valuation Assets	\$95,987	\$95,987	\$95,987
Unfunded Liability	\$21,960	\$8,033	(\$3,495)
Funded Ratio	81%	92%	104%

*Best estimate assumption for LEOFF 2 is 7.4% with sensitivities equal to 6.4%/8.4%.

ACTUARIAL GAIN/LOSS

The following 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. The tables that follow provide more details on the individual contribution rate gains and losses for both the Normal Cost rate and the UAAL rate that employers pay.

Change in Employer and State Plan 2/3 Normal Cost Rate by Source			
Change in Normal Costs	PERS	TRS	SERS
2018 Normal Cost Before Laws of 2019	7.45%	8.40%	8.02%
Remove Rate Floor	0.00%	0.00%	0.00%
Remove Prior Employer Liability	(0.02%)	(0.38%)	0.00%
2018 Adjusted Normal Cost Rate	7.43%	8.02%	8.02%
Liabilities			
Salaries	0.11%	0.60%	0.91%
Termination	(0.15%)	(0.24%)	(0.16%)
Retirement	0.01%	0.02%	0.03%
Disability	0.01%	0.00%	0.01%
Mortality	0.01%	0.01%	0.01%
Growth / Return to Work	0.65%	1.10%	1.09%
Other Liabilities	0.12%	0.02%	0.13%
Total Liability Gains/Losses	0.76%	1.51%	2.02%
Assets*			
Contributions	(0.12%)	(0.03%)	(0.12%)
Disbursements	(0.03%)	(0.02%)	(0.01%)
Investment Returns	(0.65%)	(0.43%)	(0.59%)
Total Asset Gains/Losses	(0.80%)	(0.48%)	(0.73%)
Incremental Changes			
Plan Change	0.00%	0.00%	0.00%
Method Change	0.03%	0.01%	0.03%
Assumption Change	0.02%	0.02%	0.03%
Correction Change	0.00%	0.00%	0.00%
Experience Study Change	(0.47%)	(0.01%)	(0.04%)
Total Incremental Changes Gains/Losses	(0.42%)	0.02%	0.02%
Present Value of Future Salaries Gains/Losses	(0.62%)	(1.09%)	(1.59%)
Plan 3 TAP Annuities	0.00%	0.00%	0.00%
Other Gains/Losses	0.01%	0.07%	0.02%
Total Change	(1.07%)	0.03%	(0.26%)
2019 Preliminary Normal Cost	6.36%	8.05%	7.76%
Increase from Applied Rate Floor	0.00%	0.00%	0.00%
Rate to Amortize Prior Employer Liability	0.00%	0.00%	0.00%
Excess Member Rate	N/A	0.00%	N/A
Laws of 2020	0.00%	0.00%	0.00%
2019 Adjusted Normal Cost	6.36%	8.05%	7.76%

Note: Totals may not agree due to rounding.

*Asset Gain/Loss performed on AVA not MVA.

II. ACTUARIAL EXHIBITS

Change in Employer and State Plan 2/3 Normal Cost Rate by Source (Continued)			
Change in Normal Costs	PSERS	LEOFF¹	WSPRS²
2018 Normal Cost Before Laws of 2019	6.76%	3.43%	20.41%
Remove Rate Floor	0.00%	(0.84%)	0.00%
Remove Prior Employer Liability ³	0.00%	0.00%	(6.64%)
2018 Adjusted Normal Cost Rate	6.76%	2.59%	13.77%
Liabilities			
Salaries	0.27%	0.13%	(0.14%)
Termination	(0.22%)	(0.01%)	0.01%
Retirement	0.01%	0.01%	(0.09%)
Disability	0.01%	0.00%	0.03%
Mortality	0.01%	0.00%	0.20%
Growth / Return to Work	2.69%	0.33%	0.82%
Other Liabilities	0.01%	0.04%	0.36%
Total Liability Gains/Losses	2.78%	0.50%	1.19%
Assets⁴			
Contributions	(0.19%)	(0.13%)	0.16%
Disbursements	0.00%	0.01%	0.04%
Investment Returns	(0.19%)	(0.33%)	(1.68%)
Total Asset Gains/Losses	(0.37%)	(0.45%)	(1.47%)
Incremental Changes			
Plan Change	0.00%	0.00%	0.00%
Method Change	0.00%	0.01%	0.01%
Assumption Change	0.00%	0.00%	0.17%
Correction Change	(0.01%)	0.00%	0.00%
Experience Study Change	(0.41%)	(0.10%)	(0.06%)
Total Incremental Changes Gains/Losses	(0.42%)	(0.09%)	0.12%
Present Value of Future Salaries Gains/Losses	(2.30%)	(0.23%)	(0.89%)
Other Gains/Losses	0.05%	(0.00%)	0.05%
Total Change	(0.26%)	(0.27%)	(1.00%)
2019 Preliminary Normal Cost	6.50%	2.32%	12.77%
Increase from Applied Rate Floor	0.00%	0.75%	0.00%
Rate to Amortize Prior Employer Liability	0.00%	0.00%	1.32%
Excess Member Rate	N/A	N/A	4.32%
Laws of 2020	0.00%	0.00%	0.16%
2019 Adjusted Normal Cost	6.50%	3.07%	18.57%

Note: Totals may not agree due to rounding.

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

² The WSPRS normal cost contribution rate applies to Plans 1 and 2.

³ For WSPRS, this rate is attributable to the excess member rate (5.32%), and the remaining (1.32%) is attributable to prior employer liability.

⁴ Asset Gain/Loss performed on AVA not MVA.

Change in Employer and State Plan 1 UAAL Rate by Source ¹			
Change in UAAL Rate	PERS, SERS, & PSERS ²	TRS	LEOFF ³
2018 UAAL Rate Before Laws of 2019	4.08%	6.11%	(26.29%)
Remove Rate Floor	0.00%	(0.32%)	0.00%
Remove Plan 1 Benefit Improvements	(0.24%)	(0.36%)	N/A
Fixed Amortization Date Adjustment ⁴	N/A	N/A	0.66%
2018 Adjusted UAAL Rate	3.84%	5.43%	(25.63%)
Liabilities	0.00%	0.00%	0.00%
Salaries	0.00%	0.01%	(0.02%)
Termination	0.00%	0.00%	0.00%
Retirement	0.00%	0.00%	(0.03%)
Disability	0.00%	0.00%	0.00%
Mortality	0.00%	0.00%	(0.17%)
Return to Work	0.00%	0.00%	0.00%
Inflation (CPI)	0.00%	0.00%	0.41%
Other Liabilities	0.01%	0.00%	0.38%
Total Liability Gains/Losses	0.01%	0.01%	0.57%
Assets⁵	0.00%	0.00%	0.00%
Contributions	(0.22%)	(0.32%)	(0.00%)
Disbursements	0.01%	0.04%	0.07%
Investment Returns	(0.20%)	(0.33%)	(2.77%)
Total Asset Gains/Losses	(0.40%)	(0.61%)	(2.70%)
Incremental Changes	0.00%	0.00%	0.00%
Plan Change	0.09%	0.19%	0.00%
Method Change	0.00%	0.00%	0.00%
Assumption Change	0.00%	0.00%	0.00%
Correction Change	0.00%	0.00%	0.00%
Experience Study Change	(0.27%)	(0.25%)	0.33%
Total Incremental Changes Gains/Losses	(0.18%)	(0.06%)	0.33%
Present Value of Future Salaries Gains/Losses	(0.37%)	(0.67%)	0.55%
Other Gains/Losses	0.06%	0.06%	(0.65%)
Total Change	(0.88%)	(1.27%)	(1.90%)
2019 Preliminary UAAL Rate	2.96%	4.16%	(27.53%)
Increase from Applied Rate Floor	0.54%	1.59%	0.00%
Increase from Plan 1 Benefit Improvements	0.10%	0.21%	N/A
Laws of 2020	0.11%	0.23%	0.00%
2019 Adjusted UAAL Rate	3.71%	6.19%	(27.53%)

Note: Totals may not agree due to rounding.

¹ WSPRS does not have a UAAL rate.

² Rate determined to fund the PERS Plan 1 UAAL. SERS and PSERS employers also pay the PERS 1 UAAL rate.

³ 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.

⁴ LEOFF 1 fixed amortization date is 6/30/2024.

⁵ Asset Gain/Loss performed on AVA not MVA.

III. PARTICIPANT DATA

**2019
Actuarial
Valuation
Report**

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 RCW.

<p>PERS - Public Employees' Retirement System <i>Chapter 41.40 RCW</i></p>	<p>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.</p>
<p>TRS - Teachers' Retirement System <i>Chapter 41.32 RCW</i></p>	<p>Certificated teachers; administrators; and educational staff associates.</p>
<p>SERS - School Employees' Retirement System <i>Chapter 41.35 RCW</i></p>	<p>Classified school district employees and educational service district employees.</p>
<p>PSERS - Public Safety Employees' Retirement System <i>Chapter 41.37 RCW</i></p>	<p>Correction officers (state, state community, county, city, and local community); state park rangers; enforcement officers with the Liquor and Cannabis Board, Washington State Patrol (commercial vehicle), Gambling Commission, and the Department of Natural Resources; security staff and nurses working at certain state institutions and local correctional departments.</p>
<p>LEOFF - Law Enforcement Officers' and Fire Fighters' Retirement System <i>Chapter 41.26 RCW</i></p>	<p>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.</p>
<p>WSPRS - Washington State Patrol Retirement System <i>Chapter 43.43 RCW</i></p>	<p>Commissioned officers of the Washington State Patrol.</p>

In addition to the six systems described above, the state also administers benefits for three other retirement systems not included in this valuation. Those systems are the volunteer fire fighters, which has a separate actuarial valuation, and two small judicial systems, which are closed to new members. Any judge hired after June 30, 1988, becomes a member of the PERS Plans 2/3.

OSA also prepares valuations for certain retirement provisions under the Higher Education Retirement Plans. These plans are offered to certain employees of colleges and universities in Washington and are not administered by DRS. The results of these valuations are provided in separate reports.

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.

III. PARTICIPANT DATA

Reconciliation of Active and Annuitant Data									
	All Systems	PERS				TRS			
		Plan 1	Plan 2	Plan 3	Total	Plan 1	Plan 2	Plan 3	Total
2018 Actives	323,491	2,011	122,165	36,707	160,883	491	20,096	54,432	75,019
Transfers	12,552	0	(222)	5,482	5,260	0	(38)	3,077	3,039
Hires/Rehires	27,776	35	13,170	1,031	14,236	6	3,253	1,846	5,105
New Retirees	(7,518)	(453)	(3,324)	(440)	(4,217)	(145)	(264)	(970)	(1,379)
Deaths	(424)	(9)	(225)	(30)	(264)	0	(9)	(53)	(62)
Terminations	(25,432)	(46)	(9,110)	(4,703)	(13,859)	(2)	(1,477)	(2,981)	(4,460)
2019 Actives	330,445	1,538	122,454	38,047	162,039	350	21,561	55,351	77,262
2018 Annuitants	185,139	46,880	50,664	4,965	102,509	33,385	5,436	11,925	50,746
New Retirees	11,901	607	5,104	734	6,445	178	477	1,808	2,463
Annuitant Deaths	(5,383)	(2,145)	(1,192)	(50)	(3,387)	(1,168)	(78)	(95)	(1,341)
New Survivors	1,248	299	378	37	714	186	23	65	274
Other	(39)	(8)	(6)	(2)	(16)	(11)	(3)	(2)	(16)
2019 Annuitants	192,866	45,633	54,948	5,684	106,265	32,570	5,855	13,701	52,126
Ratio Actives to Annuitants	1.71	0.03	2.23	6.69	1.52	0.01	3.68	4.04	1.48

Reconciliation of Active and Annuitant Data (Continued)				
	SERS			PSERS
	Plan 2	Plan 3	Total	Plan 2
2018 Actives	27,431	34,781	62,212	6,180
Transfers*	(65)	4,318	4,253	1,003
Hires/Rehires	4,055	750	4,805	1,205
New Retirees	(619)	(659)	(1,278)	(42)
Deaths	(41)	(39)	(80)	(7)
Terminations	(2,522)	(3,624)	(6,146)	(581)
2019 Actives	28,239	35,527	63,766	7,758
2018 Annuitants	9,157	8,850	18,007	231
New Retirees	1,031	1,204	2,235	62
Annuitant Deaths	(178)	(122)	(300)	(1)
New Survivors	46	55	101	4
Other	0	0	0	0
2019 Annuitants	10,056	9,987	20,043	296
Ratio Actives to Annuitants	2.81	3.56	3.18	26.21

*PSERS transfers primarily from HB 1558 allowing certain PERS members to transfer to PSERS.

Reconciliation of Active and Annuitant Data (Continued)						
	LEOFF			WSPRS		
	Plan 1	Plan 2	Total	Plan 1	Plan 2	Total
2018 Actives	26	18,130	18,156	444	597	1,041
Transfers	0	0	0	0	0	0
Hires/Rehires	0	1,358	1,358	0	64	64
New Retirees	(5)	(554)	(559)	(43)	0	(43)
Deaths	0	(9)	(9)	(2)	0	(2)
Terminations	(1)	(368)	(369)	(2)	(15)	(17)
2019 Actives	20	18,557	18,577	397	646	1,043
2018 Annuitants	7,074	5,436	12,510	1,136	0	1,136
New Retirees	6	644	650	46	0	46
Annuitant Deaths	(304)	(34)	(338)	(16)	0	(16)
New Survivors	118	22	140	15	0	15
Other	(3)	(4)	(7)	0	0	0
2019 Annuitants	6,891	6,064	12,955	1,181	0	1,181
Ratio Actives to Annuitants	0.00	3.06	1.43	0.34	N/A	0.88



SUMMARY OF PLAN PARTICIPANTS

Summary of Plan Participants								
PERS	2019				2018			
	Plan 1	Plan 2	Plan 3	Plans 2/3	Plan 1	Plan 2	Plan 3	Plans 2/3
Active Members								
Number	1,538	122,454	38,047	160,501	2,011	122,165	36,707	158,872
Total Salaries (Dollars in Millions)	\$105	\$8,582	\$2,449	\$11,031	\$131	\$8,252	\$2,278	\$10,530
Average Age	66.6	47.7	43.3	46.7	65.9	47.8	43.3	46.8
Average Service	26.2	11.9	8.2	11.0	26.0	12.1	8.2	11.2
Average Salary	\$68,120	\$70,079	\$64,368	\$68,725	\$65,269	\$67,547	\$62,058	\$66,279
Terminated Members								
Vested	396	28,726	6,286	35,012	515	28,232	5,914	34,146
Non-Vested*	2,529	113,586	0	113,586	2,782	110,579	0	110,579
Total Terminated	2,925	142,312	6,286	148,598	3,297	138,811	5,914	144,725
Annuitants								
Service Retired**	39,521	49,549	5,280	54,829	40,601	45,520	4,597	50,117
Disability Retired	754	1,869	92	1,961	812	1,900	89	1,989
Survivors	5,358	3,530	312	3,842	5,467	3,244	279	3,523
Total Annuitants	45,633	54,948	5,684	60,632	46,880	50,664	4,965	55,629
Avg. Monthly Benefit, All Annuitants***	\$2,159	\$1,777	\$990	\$1,703	\$2,091	\$1,676	\$942	\$1,610
Number of New Service Retirees	597	5,034	713	5,747	726	4,804	724	5,528
Avg. Benefit, New Service Retirees***	\$2,492	\$2,275	\$1,173	\$2,139	\$2,390	\$2,112	\$1,146	\$1,985

Note: Totals may not agree due to rounding.

*Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

**Includes retirements from active and terminated with vested status.

***Excludes additional TAP annuities purchased from Plan 3 defined contribution accounts. For more information on TAP annuities, please see the table at the end of this section.

Summary of Plan Participants (Continued)								
TRS	2019				2018			
	Plan 1	Plan 2	Plan 3	Plans 2/3	Plan 1	Plan 2	Plan 3	Plans 2/3
Active Members								
Number	350	21,561	55,351	76,912	491	20,096	54,432	74,528
Total Salaries (Dollars in Millions)	\$36	\$1,687	\$5,080	\$6,767	\$45	\$1,407	\$4,473	\$5,879
Average Age	68.0	41.6	46.3	45.0	67.1	41.6	46.2	45.0
Average Service	33.4	7.6	14.1	12.3	32.9	7.6	14.1	12.3
Average Salary	\$102,091	\$78,259	\$91,770	\$87,982	\$91,688	\$69,990	\$82,168	\$78,884
Terminated Members								
Vested	119	2,823	8,831	11,654	152	2,729	9,080	11,809
Non-Vested*	243	7,140	0	7,140	277	6,729	0	6,729
Total Terminated	362	9,963	8,831	18,794	429	9,458	9,080	18,538
Annuitants								
Service Retired**	29,275	5,532	13,058	18,590	30,063	5,130	11,342	16,472
Disability Retired	453	82	97	179	484	82	94	176
Survivors	2,842	241	546	787	2,838	224	489	713
Total Annuitants	32,570	5,855	13,701	19,556	33,385	5,436	11,925	17,361
Avg. Monthly Benefit, All Annuitants***	\$2,262	\$2,098	\$1,272	\$1,519	\$2,203	\$2,002	\$1,200	\$1,451
Number of New Service Retirees	177	472	1,784	2,256	247	420	1,653	2,073
Avg. Benefit, New Service Retirees***	\$3,466	\$2,512	\$1,531	\$1,736	\$3,109	\$2,395	\$1,455	\$1,645

Note: Totals may not agree due to rounding.

*Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

**Includes retirements from active and terminated with vested status.

***Excludes additional TAP annuities purchased from Plan 3 defined contribution accounts. For more information on TAP annuities, please see the table at the end of this section.

Summary of Plan Participants (Continued)						
SERS	2019			2018		
	Plan 2	Plan 3	Plans 2/3	Plan 2	Plan 3	Plans 2/3
Active Members						
Number	28,239	35,527	63,766	27,431	34,781	62,212
Total Salaries (Dollars in Millions)	\$1,087	\$1,365	\$2,453	\$960	\$1,219	\$2,179
Average Age	49.5	49.0	49.2	49.6	49.2	49.4
Average Service	8.7	9.5	9.1	8.9	9.6	9.3
Average Salary	\$38,505	\$38,427	\$38,462	\$34,994	\$35,037	\$35,018
Terminated Members						
Vested	6,222	9,049	15,271	6,080	8,753	14,833
Non-Vested*	16,768	0	16,768	15,260	0	15,260
Total Terminated	22,990	9,049	32,039	21,340	8,753	30,093
Annuitants						
Service Retired**	9,323	9,512	18,835	8,471	8,423	16,894
Disability Retired	274	93	367	265	92	357
Survivors	459	382	841	421	335	756
Total Annuitants	10,056	9,987	20,043	9,157	8,850	18,007
Avg. Monthly Benefit, All Annuitants***	\$941	\$523	\$733	\$905	\$501	\$707
Number of New Service Retirees	1,012	1,174	2,186	1,020	1,139	2,159
Avg. Benefit, New Service Retirees***	\$1,027	\$585	\$790	\$973	\$581	\$766

Note: Totals may not agree due to rounding.

*Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

**Includes retirements from active and terminated with vested status.

***Excludes additional TAP annuities purchased from Plan 3 defined contribution accounts. For more information on TAP annuities, please see the table at the end of this section.



III. PARTICIPANT DATA

Summary of Plan Participants (Continued)		
PSERS	2019	2018
Active Members		
Number	7,758	6,180
Total Salaries (Dollars in Millions)	\$529	\$399
Average Age	40.4	40.0
Average Service	5.4	6.2
Average Salary	\$68,236	\$64,619
Terminated Members		
Vested	629	545
Non-Vested*	2,856	2,472
Total Terminated	3,485	3,017
Annuitants		
Service Retired**	266	207
Disability Retired	18	16
Survivors	12	8
Total Annuitants	296	231
Avg. Monthly Benefit, All Annuitants	\$900	\$820
Number of New Service Retirees	60	59
Avg. Benefit, New Service Retirees	\$1,117	\$1,012

Note: Totals may not agree due to rounding.

*Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

**Includes retirements from active and terminated with vested status.



Summary of Plan Participants (Continued)						
LEOFF	2019			2018		
	Plan 1	Plan 2	Total	Plan 1	Plan 2	Total
Active Members						
Number	20	18,557	18,577	26	18,130	18,156
Total Salaries (Dollars in Millions)	\$2	\$2,117	\$2,119	\$3	\$1,982	\$1,985
Average Age	67.8	42.8	42.8	66.9	43.1	43.1
Average Service	43.3	13.6	13.6	42.3	13.9	13.9
Average Salary	\$106,597	\$114,085	\$114,077	\$108,832	\$109,319	\$109,318
Terminated Members						
Vested	1	969	970	1	934	935
Non-Vested*	27	2,193	2,220	29	2,055	2,084
Total Terminated	28	3,162	3,190	30	2,989	3,019
Annuitants						
Service Retired**	2,322	5,312	7,634	2,400	4,733	7,133
Disability Retired	2,904	473	3,377	3,023	446	3,469
Survivors	1,665	279	1,944	1,651	257	1,908
Total Annuitants	6,891	6,064	12,955	7,074	5,436	12,510
Avg. Monthly Benefit, All Annuitants	\$4,507	\$4,260	\$4,392	\$4,342	\$4,070	\$4,224
Number of New Service Retirees***	6	614	620	13	575	588
Avg. Benefit, New Service Retirees***	\$8,800	\$4,942	\$4,980	\$9,177	\$4,896	\$4,991

Note: Totals may not agree due to rounding.

*Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

**Includes retirements from active and terminated with vested status.

***Includes retirees with disabilities for Plan 1 only.



III. PARTICIPANT DATA

Summary of Plan Participants (Continued)						
WSPRS	2019			2018		
	Plan 1	Plan 2	Total	Plan 1	Plan 2	Total
Active Members						
Number	397	646	1,043	444	597	1,041
Total Salaries (Dollars in Millions)	\$47	\$62	\$109	\$52	\$55	\$107
Average Age	49.2	33.8	39.7	48.8	33.6	40.1
Average Service	22.3	7.8	13.3	22.0	7.4	13.6
Average Salary	\$119,395	\$95,495	\$104,592	\$116,625	\$92,066	\$102,541
Terminated Members						
Vested	69	37	106	71	34	105
Non-Vested*	17	64	81	17	54	71
Disability Retired**	37	0	37	40	0	40
Total Terminated	123	101	224	128	88	216
Annuitants						
Service Retired***	996	0	996	961	0	961
Survivors	185	0	185	175	0	175
Total Annuitants	1,181	0	1,181	1,136	0	1,136
Avg. Monthly Benefit, All Annuitants	\$4,611	\$0	\$4,611	\$4,414	\$0	\$4,414
Number of New Service Retirees	46	0	46	34	0	34
Avg. Benefit, New Service Retirees	\$6,187	\$0	\$6,187	\$4,987	\$0	\$4,987

Note: Totals may not agree due to rounding.

*Members who terminated without a vested lifetime benefit but are eligible for a refund of their employee contributions with interest that currently reside in the trust.

**Benefits provided outside of pension funds.

***Includes retirements from active and terminated with vested status.

Summary of Members Purchasing TAP Annuities			
	PERS 3	TRS 3	SERS 3
Number	722	1,668	921
Average Age	66.2	66.8	68.0
Avg. Monthly Benefit, All Annuitants	\$1,298	\$1,402	\$720
Number of New Purchasers	141	312	174
Avg. Purchase Price, New Purchasers*	\$227,200	\$267,300	\$120,400
Avg. Monthly Benefit, New Purchasers	\$1,246	\$1,430	\$677

*Purchased with money from the member's Plan 3 defined contribution account.

An aerial photograph of a boat moving across a large body of water, likely a lake or bay. The boat is in the lower center, leaving a white wake. The water is a deep blue-green. The surrounding land is covered in dense green forest. In the distance, there are rolling hills or mountains under a blue sky with some light clouds. Overlaid on the image are several curved, semi-transparent bands in shades of blue and green, sweeping from the top left towards the bottom right.

IV. APPENDICES

**2019
Actuarial
Valuation
Report**

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, a funding policy, economic assumptions, and demographic assumptions. The sections below list the methods and assumptions that change regularly or are new since the last actuarial valuation report. Please see the [Actuarial Methods](#) web page for descriptions of the actuarial cost methods and asset valuation method we use for this valuation, and please see the [Actuarial Assumptions](#) web page for descriptions of all remaining assumptions.

FREQUENTLY CHANGING ASSUMPTIONS

We make an assumption to help us project the value of accumulated employee contributions with interest if a member elects a refund of contributions instead of a deferred retirement allowance upon termination. We selected an assumption between contribution rates calculated in the last valuation and our estimation of long-term rates. We will no longer update this assumption annually and instead maintain the assumption until the next experience study. We will continue to monitor the assumption and update as appropriate.

PERS 1 and TRS 1 member rates are set in statute at 6 percent. 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.

Member Contribution Rates for Savings Fund Accrual	
System/Plans	Contribution Rate
PERS 2	6.50%
TRS 2	7.30%
SERS 2	6.90%
PSERS 2	7.00%
LEOFF 2	8.60%
WSPRS 1/2	8.45%

CHANGES IN METHODS AND ASSUMPTIONS SINCE THE LAST VALUATION

- ❖ We updated our demographic assumptions based on the results of our latest demographic experience study. This study is completed every six years and includes updates to a wide range of assumptions, including rates of termination, retirement and mortality. Please see the full report when available for more [details](#).
- ❖ We updated the Joint-and-Survivor (J&S) and Early Retirement Factors (ERFs) in our model. These factors are used to value benefits for early retirement and survivors of members that die prior to retirement. These factors match the J&S and ERFs that DRS plans to implement on [October 1, 2020](#).
- ❖ We simplified our modeling of medical premium reimbursement for survivors of duty-related deaths in LEOFF 2 and WSPRS.
- ❖ This valuation includes liabilities and assets for Plan 3 members purchasing TAP annuities when determining contribution rates and funded status.
- ❖ We changed our method to updating certain data items that change annually. Examples include the public safety duty-related death lump sum and Washington state average wage. We have set these values at 2018 and will project into the future using assumptions until the next demographic experience study in 2025. Please see our [website](#) for more information this method 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 the [Summary of General Plan Provisions](#) page of our website.

The tables below and those on our website 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.

IV. APPENDICES

Summary of Frequently Changing Plan Provisions—PERS			
	Plan 1	Plan 2	Plan 3
COLA	\$2.53 per Month per Year of Service (YOS) on 7/1/20*	Lesser of CPI** or 3%	Lesser of CPI** or 3%
Minimum Benefit per Month	\$64.88* per YOS on 7/1/20, \$2,015.86* for Select Annuitants	N/A	N/A
Material Plan Provision Changes Since Last Valuation	Plan 1 COLA 3% increase (C 329 L 20)	None	None
Significant Plan Provisions 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-Bellevue, WA - All Items.

Summary of Frequently Changing Plan Provisions—TRS			
	Plan 1	Plan 2	Plan 3
COLA	\$2.53 per Month per Year of Service (YOS) on 7/1/20*	Lesser of CPI** or 3%	Lesser of CPI** or 3%
Minimum Benefit per Month	\$64.88* per YOS on 7/1/20, \$2,015.86* for Select Annuitants	N/A	N/A
Changes in Plan Provisions Since Last Valuation	Plan 1 COLA 3% increase (C 329 L 20)	None	None
Significant Plan Provisions 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-Bellevue, 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	N/A	N/A
Material Plan Provision Changes Since Last Valuation	None	None
Significant Plan Provisions not Included in this Valuation	None	None

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

Summary of Frequently Changing Plan Provision—PSERS	
	Plan 2
COLA	Lesser of CPI* or 3%
Minimum Benefit per Month	N/A
Material Plan Provision Changes Since Last Valuation	None
Significant Plan Provisions not Included in this Valuation	None

*CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bellevue, 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	N/A	N/A
Material Plan Provision Changes Since Last Valuation	None	None
Significant Plan Provisions not Included in this Valuation	None	None

*CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bellevue, 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**	\$38.12 per Year of Service (YOS) on 1/1/20	\$38.12 per YOS on 1/1/20
Material Plan Provision Changes Since Last Valuation	Modified the definition of "Veteran" (C 178 L 20) Leave cash-out as pensionable salary (C 97 L 20)	Modified the definition of "Veteran" (C 178 L 20)
Significant Plan Provisions not Included in this Valuation	None	None

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

**Amount increases by 3% annually.



THE OFFICE OF THE STATE ACTUARY'S WEBSITE

Our website (leg.wa.gov/osa) contains additional information and educational material not included in this report. The site also contains an archive of prior Actuarial Valuation Reports and other recent studies that OSA has produced. The following is a list of materials found on our website that could be useful to the reader.

[Glossary](#)

Definitions for frequently used actuarial and pension terms.

[Age Distributions](#)

Tables summarizing valuation statistics by system, plan, and member/annuitant age.

[Historical Data](#)

Tables summarizing valuation statistics by retirement system and valuation period.

[Prior Actuarial Valuation Reports](#)

Archive of valuations over the past several years.

[2019 Report on Financial Condition and Economic Experience Study](#)

Report examining the financial health of the retirement systems and long-term economic assumptions.

[2013-2018 Demographic Experience Study](#)

Most recent report examining demographic behavior within each of the retirement systems.

[Risk Assessment](#)

Information examining the effect of unexpected experience on the retirement systems.

[Commentary on Risk](#)

Educational information on the risks inherent in our actuarial measurements and how these measurements could vary under different circumstances.

[Contribution Rate Projections](#)

Forecasts for future contribution rates based on projected assets and liabilities.

[Interactive Reports](#)

Set of reports displaying funded status, projected benefit payments, and contribution rates that vary by key inputs the user selects.

WASHINGTON STATE

2019 ACTUARIAL VALUATION

AUGUST • 2020



Office of the
State Actuary

*“Supporting financial
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