WASHINGTON STATE

2021 ACTUARIAL VALUATION

AUGUST • 2022

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Washington State Investment Board
Legislative Support Services
Legislative Evaluation and Accountability Program Committee

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Letter of Introduction
Actuarial Valuation Report
As of June 30, 2021

August 2022

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 2023-25 Biennium based on a June 30, 2021, 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 two years.

This report is organized into five sections. The **Summary of Key Results** section provides a high-level summary of the valuation results for all systems combined and commentary on risk. The **Actuarial Exhibits** and **Participant Data** sections of the report provide detailed actuarial asset and liability information, as well as participant data 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. The **Resource** section outlines additional supplemental information found on our website.

We encourage you to submit any questions you might have concerning this report to 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,

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

Michael T. Harbour, ASA, MAAA
Actuary

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I. SUMMARY OF KEY RESULTS

INTENDED USE

The purpose of this report is to develop contribution rates required to fund the Washington State retirement systems for the 2023-25 Biennium based on a June 30, 2021, measurement date and based on the funding policy described in this section. We modified the report to provide information on the contribution rates, funding progress, and developments in the plans over the past two years, i.e., from the prior to current rate-setting valuation. We believe this change assists users in identifying key changes and trends impacting the calculated contribution rates. 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 2021 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.

COMMENTARY ON RISK

Actuarial Standards of Practice (ASOP) guide actuaries when performing and communicating their work. ASOP 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.

CONTRIBUTION RATES

We determine the member and employer contribution rates as a percentage of salary. The following summary table shows contribution rates based on the 2021 valuation, along with rates from the 2019 valuation. Throughout this report, we reconcile how plan experience compares to our assumptions over the past two years. In doing so, we compare the contribution rates calculated under this valuation against those rates calculated under the previous rate-setting valuation. The **Actuarial Exhibits** section of this report shows how we developed the contribution rates for 2021.

Calculated Contribution Rates				
	Plan 1		Plans 2/3	
	2021	2019	2021	2019
PERS				
Member*	6.00%	6.00%	7.20%	6.36%
Total Employer	11.05%	10.07%	11.05%	10.07%
TRS				
Member*	6.00%	6.00%	8.64%	8.05%
Total Employer	16.16%	14.24%	16.16%	14.24%
SERS				
Member*	N/A	N/A	8.47%	7.76%
Total Employer	N/A	N/A	12.32%	11.47%
PSERS				
Member	N/A	N/A	7.46%	6.50%
Total Employer	N/A	N/A	11.31%	10.21%
LEOFF				
Member	0.00%	0.00%	9.94%	7.68%
Employer	0.00%	0.00%	5.96%	4.61%
State	0.00%	0.00%	3.98%	3.07%
WSPRS				
Member	8.61%	8.61%	8.61%	8.61%
Employer (State)	24.10%	18.57%	24.10%	18.57%

Note: Employer rates exclude administrative expense rate.

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

The calculated contribution rates do not include the Pension Funding Council's (PFC) October 2021 action to phase-in the impacts from changes in the economic assumptions. The PFC action calls for a six-year phase-in including a cap on contribution rates in the 2023-25 Biennium at the levels adopted for the 2021-23 Biennium. The phase-in details for the 2025-27 and 2027-29 Biennia were not defined. Please see this document for details of the PFC action.

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.

No member or employer or state contributions are required for LEOFF Plan 1, as the plan remains fully funded; see RCW 41.26.080(2). Substitute House Bill (SHB) 1701 capped LEOFF 2 contribution rates at the levels adopted by the LEOFF Plan 2 Retirement Board for the 2023-25 Biennium; the calculated contribution rates in the previous table do not reflect this cap.

The employer contribution rate for WSPRS Plans 1 and 2 excludes the rate smoothing as referenced in the 2019 Legislative Session laws (C 416 L 19, Sec 711(6)). The combined impact of this legislation and the aforementioned action in October of 2021 were addressed as part of the PFC's July 2022 contribution rate adoption.

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 and will be updated in the fall of 2022 to reflect the results from this *2021 Actuarial Valuation Report*. 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 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 Plan 2 Retirement 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 following table compares the member and total employer contribution rates that were adopted by the PFC and the LEOFF Plan 2 Retirement Board against the rates that were calculated by the Office of the State Actuary (OSA).

2023-25 Contribution Rates		
	Calculated	**Adopted**
PERS 1		
Member	6.00%	6.00%
Total Employer	11.05%	10.21%
PERS 2/3		
Member*	7.20%	6.36%
Total Employer	11.05%	10.21%
TRS 1		
Member	6.00%	6.00%
Total Employer	16.16%	14.51%
TRS 2/3		
Member*	8.64%	8.05%
Total Employer	16.16%	14.51%
SERS 2/3		
Member*	8.47%	7.76%
Total Employer	12.32%	11.61%
PSERS 2		
Member	7.46%	6.60%
Total Employer	11.31%	10.45%
LEOFF 1		
Member	0.00%	0.00%
Employer	0.00%	0.00%
State	0.00%	0.00%
LEOFF 2**		
Member	9.94%	8.53%
Employer	5.96%	5.12%
State	3.98%	3.41%
WSPRS 1/2		
Member	8.61%	8.61%
Employer (State)	24.10%	17.66%

Note: Employer rates exclude administrative expense rate.

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

***The LEOFF 2 Board adopts contribution rates for LEOFF 2. Please see the 2021 LEOFF 2 Actuarial Valuation Report for more information.*

The PFC Adopted Contribution Rates from the July 2022 meeting displayed above are consistent with the phase-in of economic assumption costs described in their July motion.

FUNDING POLICY

Washington State relies on systematic actuarial funding to finance the ongoing 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 Plan 1 not later than June 30, 2024.
- Fully amortize the Unfunded Actuarial Accrued Liability (UAAL) in PERS Plan 1 and TRS Plan 1 within a rolling ten-year period using methods and assumptions that balance needs for increased benefit security, decreased contribution rate volatility, and affordability of pension contribution rates.
- Establish long-term employer contribution rates that will remain a relatively predictable proportion of future state budgets.
- Fund, to the extent feasible, all benefits for Plans 2 and 3 members over the working lives of those members so that the taxpayers who receive the 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 solely from employer contributions 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.

SHB 1701 revised the LEOFF 2 funding minimum contribution rate funding policy to include three tiers of rates based on the plan's funded ratio. The minimum rates equal 100 percent of the Entry Age Normal Cost (EANC) when the funded ratio is below 105 percent. The minimum rates decrease to 90 percent of the EANC when the funded ratio meets or exceeds 105 percent and is less than 110 percent. If the funded ratio is at least 110 percent, then the minimum rates equal 80 percent of the EANC. An additional reduction in 90 and 100 percent minimum EANC rates applies for 15 years starting in the 2025-27 Biennium. Please see the bill language and OSA's fiscal note for more details.

COMMENTS ON 2021 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, and covered population and plan experience that varies from our expectations.

CHANGES IN PLAN PROVISIONS

Laws passed during the 2022 Legislative Session expanding benefits for several systems and groups:

- Senate Bill (SB) 5676 granted a one-time cost-of-living adjustment for PERS and TRS Plan 1 members.
- House Bill 1669 expanded disability benefits for PSERS Plan 2 members.
- Substitute Senate Bill 5791 provided a lump sum benefit payment to LEOFF Plan 1 members and beneficiaries.
- SHB 1701 expanded benefits for LEOFF Plan 2 members, capped 2023-25 Biennium contribution rates, and altered the minimum contribution rate funding policy.

The noted laws above represent material benefit plan provision changes from the 2021 and 2022 Legislative Sessions and are not meant to be exhaustive. Please see the **Actuarial Methods and Assumptions** and **Summary of Plan Provisions** section of this report for additional details and commentary.

CHANGES IN ASSUMPTIONS AND METHODS

- This valuation reflects updates to the economic assumptions for all plans consistent with our *2021 Economic Experience Study*. Recommendations for lowering the assumptions for future investment earnings and general salary growth were adopted by the PFC and the LEOFF Plan 2 Retirement Board. See the **Actuarial Gain/Loss** section for the contribution rate impact from the new assumptions for each system.
- We adjusted our Fiscal Year (FY) 2023 WSPRS salary growth assumption from 3.25 to 10.00 percent to reflect increases for Washington State patrol commissioned officers included in the 2022 supplemental budget (Chapter 297, Laws of 2022, Sec 913 [2] and 914 [2]). Please see the **Actuarial Methods and Assumptions** for more information.

CHANGES IN COVERED POPULATION AND PLAN EXPERIENCE

- The actual rate of investment return on the Market Value of Assets (MVA) was 4.52 and 31.62 percent for FYs 2020 and 2021, respectively. The 2020 asset loss is recognized in the Actuarial Value of Assets (AVA) over a three-year period for open plans and four-year period for Plans 1. The asset gain from 2021 is recognized in the AVA over an eight-year period. These deferral periods are consistent with the AVA method set in statute.
- Salaries grew more than expected for members of PERS 2/3, PSERS 2, and LEOFF 2.
- Most systems experienced lower numbers of new hires than in prior valuations (except for PSERS). Additionally, SERS experienced high levels of terminations from the COVID pandemic and temporary change to remote school environments. We expect the termination trends are short-term and did not alter our assumptions.
- The PSERS active population grew by approximately 35 percent due to additional transfers of nursing and custody staff allowed under expanded PSERS membership provisions and retiring PERS members being replaced with PSERS new hires.
- We observed no other significant changes in the retirement system population. For example, mortality experience for the retirement systems did not appear to be significantly higher during the 2019-21 Biennium as a result of COVID.

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 following 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 or "earned" 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 our Interactive Reports webpage. Also, see the Glossary on our website for brief explanations of the actuarial terms.

Actuarial Liabilities		
(Dollars in Millions)	**2021**	**2019**
All Systems		
Future Value of Fully Projected Benefits	$838,965	$767,739
Present Value of Fully Projected Benefits	151,397	126,001
Actuarial Accrued Liability	$123,621	$104,020
Valuation Interest Rate	7.00%	7.50%*

**2019 LEOFF 2 Valuation Interest Rate assumption 7.40%.*

ASSETS

The following table 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)	**2021**	**2019**
All Systems		
Market Value of Assets (MVA)	$137,256	$100,349
Actuarial Value of Assets (AVA)	115,005	95,987
Member/Employer Contributions	9,032	4,088
Disbursements	10,317	4,659
Investment Return	37,395	8,119
Other Revenue	$348	$58
MVA Return[1]	31.62%	8.86%
AVA Return[2]	10.45%	10.32%

[1] Dollar-weighted rate of return on the MVA, net of expenses. MVA return in 2020 for all systems was 4.52%.

[2] The AVA is used in determining contribution rates. AVA return in 2020 for all systems was 9.02%

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 following table 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)	**2021**	**2019**
All Systems		
a. Accrued Liability*	$123,621	$104,020
b. Market Value of Assets	137,256	100,349
c. Deferred Gains/(Losses)	22,251	4,361
d. Actuarial Value of Assets (b - c)	115,005	95,987
Unfunded Liability (a - d)	$8,616	$8,033
Funded Ratio (d / a)	93%	92%

Note: Totals may not agree due to rounding.

**Liabilities valued using Entry Age Normal cost method.*

PARTICIPANT DATA

The following table summarizes participant data used in the actuarial valuation for the plan year ending June 30, 2021, along with information from the 2019 valuation. See the **Participant Data** section of this report for participant data summarized by system and plan.

Participant Data		
All Systems	**2021**	**2019**
Active Members		
Number	334,165	330,445
Total Salaries *(in Millions)*	$25,374	$23,148
Average Annual Salary	$75,933	$70,052
Average Attained Age	46.4	46.5
Average Service	11.1	11.1
Retirees and Beneficiaries		
Number	207,844	192,866
Average Annual Benefit	$25,096	$23,796
Terminated Members		
Number Vested	65,657	64,157
Number Non-Vested*	159,398	145,423

**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. A reduction to the Valuation Interest Rate and General Salary Growth was adopted by the PFC and the LEOFF Plan 2 Retirement Board in 2021. The PFC also updated the Growth in Membership assumption to 1.00 percent. This change is consistent with our *2021 Economic Experience Study*.

Key Assumptions	
All Systems	
Valuation Interest Rate	7.00%
General Salary Growth	3.25%
Inflation	2.75%
Growth in Membership*	1.00%

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

II. ACTUARIAL EXHIBITS

Office of the State Actuary
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Actuarial Certification Letter
Actuarial Valuation Report
As of June 30, 2021

August 2022

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 (RCW). The primary purpose of this valuation is to determine contribution requirements for the retirement plans for the 2023-25 Biennium based on a June 30, 2021, 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 two years. 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 webpage provides further information on the range and likelihood of potential outcomes that vary from expected results. The Commentary on Risk webpage 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 except for the Law Enforcement Officers' and Fire Fighters' Retirement System (LEOFF) Plan 2, the assumptions used in this valuation for investment return, inflation, salary growth, and membership growth were prescribed by the Pension Funding Council (PFC) and are subject to revision by the Legislature. For LEOFF Plan 2, these assumptions are prescribed by the LEOFF Plan 2 Retirement Board. Please see our *2021 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. The Washington State Investment Board (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 Plan 2 assets to reflect an expected future transfer to the LEOFF 2

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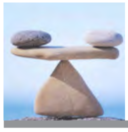


Trust Fund from the Benefit Improvement Account, defined in RCW 41.26.805, consistent with Substitute House Bill 1701 (Chapter 125, Laws of 2022). In our opinion, this information is adequate and substantially complete for purposes of this valuation.

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 the Public Employees' Retirement System (PERS) Plan 1 and the Teachers' Retirement System (TRS) Plan 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 Unfunded Actuarial Accrued Liability (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).

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

Sincerely,

Matthew M. Smith, FCA, EA, MAAA State Actuary	Michael T. Harbour, ASA, MAAA Actuary

CONTRIBUTION RATES

Calculated Member and Employer Rate Summary				
	Plan 1		Plans 2/3	
	2021	2019	2021	2019
PERS				
Member*	6.00%	6.00%	7.20%	6.36%
Employer (Normal Cost)	7.20%	6.36%	7.20%	6.36%
Employer (Plan 1 UAAL)	3.85%	3.71%	3.85%	3.71%
Total Employer	11.05%	10.07%	11.05%	10.07%
TRS				
Member*	6.00%	6.00%	8.64%	8.05%
Employer (Normal Cost)	9.70%	8.05%	9.70%	8.05%
Employer (Plan 1 UAAL)	6.46%	6.19%	6.46%	6.19%
Total Employer	16.16%	14.24%	16.16%	14.24%
SERS				
Member*	N/A	N/A	8.47%	7.76%
Employer (Normal Cost)	N/A	N/A	8.47%	7.76%
Employer (PERS Plan 1 UAAL)	N/A	N/A	3.85%	3.71%
Total Employer	N/A	N/A	12.32%	11.47%
PSERS				
Member	N/A	N/A	7.46%	6.50%
Employer (Normal Cost)	N/A	N/A	7.46%	6.50%
Employer (PERS Plan 1 UAAL)	N/A	N/A	3.85%	3.71%
Total Employer	N/A	N/A	11.31%	10.21%
LEOFF				
Member	0.00%	0.00%	9.94%	7.68%
Employer	0.00%	0.00%	5.96%	4.61%
State (Normal Cost)	0.00%	0.00%	3.98%	3.07%
State (Plan 1 UAAL)	0.00%	0.00%	0.00%	0.00%
Total State	0.00%	0.00%	3.98%	3.07%
WSPRS				
Member	8.61%	8.61%	8.61%	8.61%
Employer (State)	24.10%	18.57%	24.10%	18.57%

Note: Employer rates exclude administrative expense rate.

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

Development of 2021 Employer/State Rates					
	PERS		TRS		SERS
	Plan 1	Plans 2/3	Plan 1	Plans 2/3	Plans 2/3
a. Total Normal Cost	13.20%	14.40%	15.70%	18.34%	16.94%
b. Member Normal Cost*	6.00%	7.20%	6.00%	8.64%	8.47%
c. Employer Contribution (a - b)	7.20%	7.20%	9.70%	9.70%	8.47%
d. Cost to Amortize UAAL	3.85%	3.85%	6.46%	6.46%	3.85%
e. Total Employer Rate (c + d)	**11.05%**	**11.05%**	**16.16%**	**16.16%**	**12.32%**

Note: Employer rates exclude administrative expense rate.

**Plan 3 members do not contribute to the defined benefit plan. TRS Plan 2 member rate at current law maximum of 8.64 percent. The portion of the contribution rate exceeding the maximum of 0.53 percent is added to the Employer Contribution.*

Development of 2021 Employer/State Rates *(Continued)*				
	PSERS	LEOFF		WSPRS
	Plan 2	Plan 1	Plan 2	Plans 1/2
a. Total Normal Cost	14.92%	0.00%	19.88%	32.71%
b. Member Normal Cost*	7.46%	0.00%	9.94%	8.61%
c. Employer Contribution (a - b)	7.46%	0.00%	9.94%	24.10%
d. Cost to Amortize UAAL	3.85%	0.00%	0.00%	N/A
e. Total Employer Rate (c + d)**	**11.31%**	**0.00%**	**5.96%**	**24.10%**

Note: Employer rates exclude administrative expense rate.

**Plan 3 members do not contribute to the defined benefit plan. WSPRS member rate at current law maximum of 8.61 percent. The portion of the contribution rate exceeding the maximum of 7.57 percent is added to the Employer Contribution.*

***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 - 2021	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 - 2021	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% 7.34%	0.76% 0.34%	8.44% 7.68%	Expanded the definition of pensionable overtime.	C 181 L 17
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).*

The following table compares the member and total employer contribution rates that were adopted by the PFC and the LEOFF Plan 2 Retirement Board against the rates that were calculated by OSA. Note the 2021-23 adopted rates we display include the supplemental rates charged following the 2021 and 2022 Legislative Sessions.

Contribution Rates			
	2021-23 Adopted[1]	2023-25 Calculated	2023-25 Adopted
PERS 1			
Member	6.00%	6.00%	6.00%
Total Employer	10.21%	11.05%	10.21%
PERS 2/3			
Member[2]	6.36%	7.20%	6.36%
Total Employer	10.21%	11.05%	10.21%
TRS 1			
Member	6.00%	6.00%	6.00%
Total Employer	14.51%	16.16%	14.51%
TRS 2/3			
Member[2]	8.05%	8.64%	8.05%
Total Employer	14.51%	16.16%	14.51%
SERS 2/3			
Member[2]	7.76%	8.47%	7.76%
Total Employer	11.61%	12.32%	11.61%
PSERS 2			
Member	6.60%	7.46%	6.60%
Total Employer	10.45%	11.31%	10.45%
LEOFF 1			
Member	0.00%	0.00%	0.00%
Employer	0.00%	0.00%	0.00%
State	0.00%	0.00%	0.00%
LEOFF 2[3]			
Member	8.53%	9.94%	8.53%
Employer	5.12%	5.96%	5.12%
State	3.41%	3.98%	3.41%
WSPRS 1/2			
Member	8.61%	8.61%	8.61%
Employer (State)	17.66%	24.10%	17.66%

Note: Employer rates exclude administrative expense rate.

[1] 2021-23 adopted rates include 2022 Session supplemental rates.

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

[3] The LEOFF 2 Board adopts contribution rates for LEOFF 2.

The tables which follow 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, 80, 90, or 100 percent for LEOFF Plan 2 (dependent on the funded ratio), 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. Before adjustments for benefit improvements, the minimum UAAL rate is 3.50 percent in PERS 1 and 5.75 percent in TRS 1. Please see the Glossary on our website for a more detailed explanation of EAN and UAAL.

The contribution rates developed in these tables do not reflect the cap to contribution rates set by SHB 1701 or the PFC economic assumption phase-in adoption.

We provide additional contribution rate calculations on our Interactive Reports webpage. 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	$346,044	$224,692	$52,536
b. Present Value of Fully Projected Benefits	63,347	29,256	9,906
c. Valuation Assets	49,451	19,098	7,257
d. Unfunded Fully Projected Benefits (b - c)	13,895	10,158	2,648
e. Past Liability Balance	0	0	0
f. Adjusted Unfunded (d - e)	**$13,895**	**$10,158**	**$2,648**
Present Value of Projected Salaries to Current Members (PVS)			
g. Plan 1 PVS	N/A	N/A	N/A
h. Plan 2 PVS	83,598	27,074	9,959
i. Plan 3 PVS	25,861	56,632	11,358
j. Weighted PVS (2g + 2h + i)	**$193,057**	**$110,779**	**$31,276**
k. Member Normal Cost (f / j)	7.20%	9.17%	8.47%
l. Member Minimum Contribution Rate	4.84%	5.92%	5.20%
m. Prior Year Member Maximum Contribution Rate	N/A	8.64%	N/A
n. Member Contribution Rate with Max/Min	7.20%	8.64%	8.47%
o. Change In Plan Provisions (Laws of 2022)	0.00%	0.00%	0.00%
p. Calculated Member Contribution Rate (n + o)*	**7.20%**	**8.64%**	**8.47%**
2. Calculated Employer Normal Cost Rate			
a. Present Value of Fully Projected Benefits	$63,347	$29,256	$9,906
b. Valuation Assets	49,451	19,098	7,257
c. Unfunded Benefits (a - b)	13,895	10,158	2,648
d. Present Value of Member Contributions	6,017	2,483	843
e. Past Liability Balance**	0	0	0
f. Employer Responsibility (c - d - e)	**$7,878**	**$7,675**	**$1,805**
Present Value of Projected Salaries to Current Members (PVS)			
g. Plan 1 PVS	N/A	N/A	N/A
h. Plan 2 PVS	83,598	27,074	9,959
i. Plan 3 PVS	25,861	56,632	11,358
j. Total PVS (g + h + i)	**$109,459**	**$83,706**	**$21,317**
k. Employer Normal Cost (f / j)	7.20%	9.17%	8.47%
l. Employer Minimum Contribution Rate	4.84%	5.92%	5.20%
m. Employer Contribution Rate with Minimum	7.20%	9.17%	8.47%
n. Excess Employer Rate	N/A	0.53%	N/A
o. Rate to Amortize Past Liability Balance**	0.00%	0.00%	0.00%
p. Change In Plan Provisions (Laws of 2022)	0.00%	0.00%	0.00%
q. Calculated Employer Contribution Rate (m + n + o + p)	**7.20%**	**9.70%**	**8.47%**
3. Adopted Normal Cost Rates for 2023-25			
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.*

Development of Normal Cost Rates *(Continued)*			
(Dollars in Millions)	PSERS 2	LEOFF 2	WSPRS 1/2
1. Calculated Member Normal Cost Rate			
a. Future Value of Fully Projected Benefits	$20,744	$138,638	$9,896
b. Present Value of Fully Projected Benefits	2,049	21,075	1,889
c. Valuation Assets[1]	1,013	16,494	1,483
d. Unfunded Fully Projected Benefits (b - c)	1,035	4,580	407
e. Past Liability Balance	0	0	4
f. Adjusted Unfunded (d - e)	**$1,035**	**$4,580**	**$403**
Present Value of Projected Salaries to Current Members (PVS)			
g. Plan 1 PVS	N/A	N/A	$180
h. Plan 2 PVS	7,031	26,475	1,065
i. Plan 3 PVS	N/A	N/A	N/A
j. Weighted PVS (2g + 2h + i)	**$14,062**	**$52,950**	**$2,489**
k. Member Normal Cost (f / j)	7.36%	8.65%	16.18%
l. Member Minimum Contribution Rate	6.02%	9.94%	7.83%
m. Prior Year Member Maximum Contribution Rate	N/A	N/A	8.61%
n. Member Contribution Rate with Max/Min	7.36%	9.94%	8.61%
o. Change In Plan Provisions (Laws of 2022)	0.10%	0.00%	0.00%
p. Calculated Member Contribution Rate (n + o)	**7.46%**	**9.94%**	**8.61%**
2. Calculated Employer Normal Cost Rate			
a. Present Value of Fully Projected Benefits	$2,049	$21,075	$1,889
b. Valuation Assets[1]	1,013	16,494	1,483
c. Unfunded Benefits (a - b)	1,035	4,580	407
d. Present Value of Member Contributions	518	2,290	201
e. Past Liability Balance	0	0	4
f. Employer Responsibility (c - d - e)	**$518**	**$2,290**	**$201**
Present Value of Projected Salaries to Current Members (PVS)			
g. Plan 1 PVS	N/A	N/A	$180
h. Plan 2 PVS	7,031	26,475	1,065
i. Plan 3 PVS	N/A	N/A	N/A
j. Total PVS (g + h + i)	**$7,031**	**$26,475**	**$1,244**
k. Employer Normal Cost (f / j)	7.36%	8.65%	16.18%
l. Employer Minimum Contribution Rate	6.02%	9.94%	7.83%
m. Employer Contribution Rate with Minimum	7.36%	9.94%	16.18%
n. Excess Employer Rate	N/A	N/A	7.57%
o. Rate to Amortize Past Liability Balance[2]	N/A	N/A	0.35%
p. Change In Plan Provisions (Laws of 2022)	0.10%	0.00%	0.00%
q. Calculated Employer Contribution Rate (m + n + o + p)	**7.46%**	**9.94%**	**24.10%**
3. Adopted Normal Cost Rates for 2023-25[3]			
a. Member Contribution Rate	6.60%	8.53%	8.61%
b. Employer Contribution Rate	6.60%	5.12%	17.66%
c. State Contribution Rate	N/A	3.41%	N/A
d. Total Contribution Rate (a + b + c)	**13.20%**	**17.06%**	**26.27%**

Note: Totals may not agree due to rounding.

[1] LEOFF 2's assets include $450 million transferred from the LEOFF 2 Benefit Improvement Account under SHB 1701 measured at June 30, 2021.

[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)				
(Dollars in Millions)		**PERS 1**	**TRS 1**	**LEOFF 1**
a.	**Future Value of Fully Projected Benefits**	$22,145	$15,836	$8,436
b.	**Present Value of Fully Projected Benefits (PVFB)**	11,216	8,094	4,032
c	**Valuation Assets**	8,064	6,001	6,143
d.	**Actuarial Present Value of Future Normal Costs**	24	6	0
e.	**Balance of Plan 1 Benefit Improvements**[1]	243	239	N/A
f.	**UAAL (b - c - d - e)**	**$2,884**	**$1,848**	**($2,110)**
g.	**Amortization Date**	N/A	N/A	6/30/2024
h.	**Present Value of Projected Salaries**[2]	$141,134	$67,917	$2,234
i.	**Contribution Rate Before Adjustments (f / h)**	2.04%	2.72%	(94.44%)
j.	**Minimum Contribution Rate**	3.50%	5.75%	N/A
k.	**Preliminary Contribution Rate**	3.50%	5.75%	(94.44%)
l.	**Plan 1 Benefit Improvements**	0.21%	0.44%	N/A
m.	**Change In Plan Provisions (Laws of 2022)**	0.14%	0.27%	7.92%
n.	**Calculated Plan 1 UAAL Contribution Rates (k + l + m)**[3]	**3.85%**	**6.46%**	**(86.52%)**
Adopted UAAL Contribution Rates for 2023-25		**3.85%**	**6.46%**	**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 improvents 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	Plan 1	Plans 2/3	Plans 2/3
Active Members					
Retirement	$313	$33,222	$98	$16,874	$4,896
Termination	0	4,053	0	3,693	839
Death	2	190	0	117	33
Disability	0	153	0	51	24
ROC[1] on Termination	0	618	0	81	75
ROC[1] on Death	4	214	1	39	20
Total Active	**$319**	**$38,450**	**$99**	**$20,855**	**$5,889**
Inactive Members					
Terminated Vested	$43	$3,816	$13	$1,420	$939
Terminated Non-Vested[2]	6	390	2	73	57
Service Retired[3]	9,986	19,624	7,497	6,183	2,774
Disability Retired	90	159	67	13	18
Survivors	773	663	415	130	78
TAP Annuities	0	244	0	582	152
Total Inactive	**$10,898**	**$24,896**	**$7,995**	**$8,401**	**$4,017**
Laws of 2022	177	0	169	0	0
2021 Total	**$11,393**	**$63,347**	**$8,263**	**$29,256**	**$9,906**
2019 Total	**$11,575**	**$51,593**	**$8,415**	**$23,168**	**$8,096**

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	Plans 1/2	
Active Members					
Retirement	$1,549	$20	$12,389	$758	$70,119
Termination	225	0	215	6	9,032
Death	6	0	133	4	485
Disability	14	0	650	1	892
ROC[1] on Termination	58	0	129	4	965
ROC[1] on Death	10	0	86	2	376
Total Active	**$1,862**	**$20**	**$13,601**	**$774**	**$81,869**
Inactive Members					
Terminated Vested	$72	$0	$390	$22	$6,714
Terminated Non-Vested[2]	26	0	22	1	578
Service Retired[3]	85	1,808	6,506	1,001	55,465
Disability Retired	2	1,465	357	4	2,174
Survivors	1	740	198	87	3,084
TAP Annuities	0	0	0	0	978
Total Inactive	**$187**	**$4,013**	**$7,473**	**$1,115**	**$68,995**
Laws of 2022[4]	11	177	0	0	533
2021 Total	**$2,060**	**$4,209**	**$21,075**	**$1,889**	**$151,397**
2019 Total	**$1,391**	**$4,077**	**$16,096**	**$1,589**	**$126,001**

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).

[4] LEOFF 2 liability increases from SHB 1701 included in the Active Members and Service Retired line items. We estimate a total liability increase of approximately $1,250 million measured at June 30, 2021.

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	$292	$24,880	$93	$10,801	$3,515
Termination	(4)	2,193	(1)	2,042	406
Death	2	135	0	75	23
Disability	0	69	0	18	10
ROC[2] on Termination	(0)	(263)	(0)	(40)	(23)
ROC[2] on Death	3	129	1	15	11
Total Active	**$293**	**$27,143**	**$93**	**$12,912**	**$3,941**
Inactive Members					
Terminated Vested	$43	$3,816	$13	$1,420	$939
Terminated Non-Vested[3]	6	390	2	73	57
Service Retired[4]	9,986	19,624	7,497	6,183	2,774
Disability Retired	90	159	67	13	18
Survivors	773	663	415	130	78
TAP Annuities	0	244	0	582	152
Total Inactive	**$10,898**	**$24,896**	**$7,995**	**$8,401**	**$4,017**
Laws of 2022	177	0	169	0	0
2021 Total	**$11,368**	**$52,039**	**$8,257**	**$21,312**	**$7,958**
2019 Total	**$11,535**	**$42,600**	**$8,405**	**$16,883**	**$6,474**

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).

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	$765	$19	$7,940	$501	$48,806
Termination	84	0	36	2	4,759
Death	3	0	18	1	257
Disability	5	0	336	0	437
ROC[2] on Termination	(9)	0	(32)	(1)	(368)
ROC[2] on Death	4	0	47	1	211
Total Active	**$852**	**$19**	**$8,346**	**$504**	**$54,103**
Inactive Members					
Terminated Vested	$72	$0	$390	$22	$6,714
Terminated Non-Vested[3]	26	0	22	1	578
Service Retired[4]	85	1,808	6,506	1,001	55,465
Disability Retired	2	1,465	357	4	2,174
Survivors	1	740	198	87	3,084
Tap Annuities	0	0	0	0	978
Total Inactive	**$187**	**$4,013**	**$7,473**	**$1,115**	**$68,995**
Laws of 2022[5]	1	177	0	0	523
2021 Total	**$1,039**	**$4,209**	**$15,819**	**$1,620**	**$123,621**
2019 Total	**$685**	**$4,077**	**$11,992**	**$1,370**	**$104,020**

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).

[5] LEOFF 2 accrued liability increases from SHB 1701 included in the Active Members and Service Retired line items. We estimate a total accrued liability increase of approximately $920 million measured at June 30, 2021.

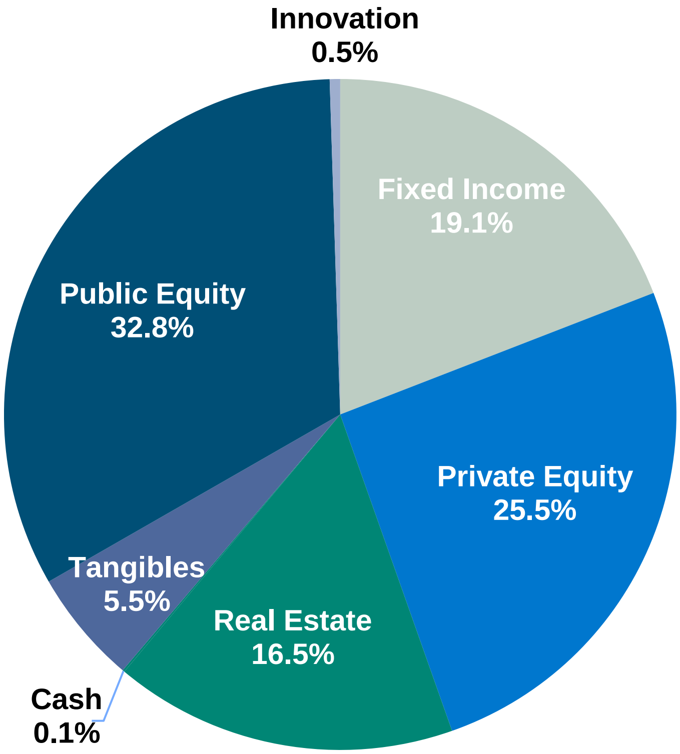
Some line items in the EAN accrued liability tables are negative. This is a result of how these benefits are accrued, over a member's working career, under the EAN actuarial cost method. The accrued liability for a given benefit provision is the difference between (1) today's value of all future benefits 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 Of 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.

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 our Interactive Reports webpage.

PLAN ASSETS

Retirement Commingled Trust Fund (CTF) Asset Allocation



Source: Washington State Investment Board June 30, 2021, Quarterly Report.

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 43 of the *2021 Economic Experience Study* for more information.

The following tables show the MVA changes from the previous contribution rate-setting valuation to this year's valuation.

Change in Market Value of Assets								
(Dollars in Millions)	PERS				TRS			
	Plan 1	TAP*	Plans 2/3 Pension**	Total	Plan 1	TAP*	Plans 2/3 Pension**	Total
2019 Market Value	**$7,851**	**$166**	**$42,365**	**$42,532**	**$5,880**	**$427**	**$15,516**	**$15,943**
Revenue								
Member Contributions	$10	$0	$1,462	$1,462	$3	$0	$298	$298
Employer/State Contributions	1,472	0	1,875	1,875	1,072	0	1,190	1,190
Total Contributions	**$1,482**	**$0**	**$3,337**	**$3,337**	**$1,075**	**$0**	**$1,488**	**$1,488**
Investment Return	$2,675	$74	$16,028	$16,102	$1,995	$177	$6,000	$6,178
Restorations* **	4	0	68	68	1	0	7	7
Transfers In	0	65	1	67	0	115	3	117
Miscellaneous	0	0	0	0	0	0	0	0
Total Revenue	**$4,161**	**$140**	**$19,434**	**$19,574**	**$3,071**	**$292**	**$7,498**	**$7,790**
Disbursements								
Monthly Benefits	$2,379	$28	$2,923	$2,951	$1,772	$69	$869	$938
Refunds	8	0	88	88	2	0	9	9
Total Benefits	**2,387**	**28**	**3,011**	**3,039**	**1,774**	**69**	**878**	**947**
Transfers Out	0	0	7	7	0	0	3	3
Expenses	0	0	1	1	0	0	2	2
Payables	0	0	0	0	0	0	0	0
Total Disbursements	**$2,387**	**$28**	**$3,020**	**$3,048**	**$1,774**	**$69**	**$883**	**$951**
2021 Market Value	$9,626	$278	$58,780	$59,057	$7,177	$650	$22,131	$22,782
Adjustments to Market Value	$0	$0	$0	$0	$0	$0	$0	$0
2021 Adjusted Market Value (MV)	$9,626	$278	$58,780	$59,057	$7,177	$650	$22,131	$22,782
2021 Actuarial Value (AV)	$8,064			$49,451	$6,001			$19,098
Ratio (AV / MV)	**84%**			**84%**	**84%**			**84%**

Note: Totals may not agree due to rounding.

**Assets from purchased Total Allocation Portfolio (TAP) annuities by Plan 3 members are combined with the Plan 2/3 pension assets for purposes of calculating contribution rates.*

***Excludes defined contribution portion of Plan 3 assets.*

****Includes additional annuity purchases and service credit purchases.*

Change in Market Value of Assets *(Continued)*								
(Dollars in Millions)	SERS			PSERS	LEOFF		WSPRS	All Systems
	TAP*	Plan 2/3 Pension**	Total	Plan 2	Plan 1	Plan 2	Plans 1/2	
2019 Market Value*	**$113**	**$6,005**	**$6,118**	**$717**	**$6,029**	**$13,916**	**$1,362**	**$100,349**
Revenue								
Member Contributions	$0	$190	$190	$93	$0	$391	$20	$2,468
Employer/State Contributions	0	427	427	93	0	394	41	6,564
Total Contributions	**0**	**617**	**617**	**187**	**0**	**785**	**61**	**9,032**
Investment Return	47	2,305	2,352	313	2,057	5,233	490	37,395
Restoration***	0	2	2	1	0	44	3	130
Transfers In	32	1	33	0	0	0	1	218
Miscellaneous	0	0	0	0	0	0	0	0
Total Revenue	**$79**	**$2,926**	**$3,005**	**$501**	**$2,057**	**$6,062**	**$554**	**$46,775**
Disbursements								
Monthly Benefits	$19	$431	$451	$9	$743	$769	$140	$10,152
Refunds	0	9	9	8	0	18	1	143
Total Benefits	**19**	**441**	**460**	**18**	**743**	**787**	**142**	**10,295**
Transfers Out	0	3	3	0	0	0	0	14
Expenses	0	0	0	0	0	4	0	8
Payables	0	0	0	0	0	0	0	0
Total Disbursements	**$19**	**$444**	**$463**	**$18**	**$743**	**$791**	**$142**	**$10,317**
2021 Market Value	$173	$8,487	$8,660	$1,200	$7,343	$19,187	$1,775	$136,807
Adjustments to Market Value****	$0	$0	$0	$0	$0	$450	$0	$450
2021 Adjusted Market Value (MV)	$173	$8,487	$8,660	$1,200	$7,343	$19,637	$1,775	$137,256
2021 Actuarial Value (AV)			$7,257	$1,013	$6,143	$16,494	$1,483	$115,005
Ratio (AV / MV)			**84%**	**84%**	**84%**	**84%**	**84%**	**84%**

Note: Totals may not agree due to rounding.

**Assets from purchased Total Allocation Portfolio (TAP) annuities by Plan 3 members are combined with the Plan 2/3 pension assets for purposes of calculating contribution rates.*

***Excludes defined contribution portion of Plan 3 assets.*

****Includes additional annuity purchases and service credit purchases.*

*****Adjusted the Market Value of Assets to reflect the transfer of the Benefit Improvement Account, measured at June 30, 2021, into the LEOFF 2 trust under SHB 1701.*

Calculation of Actuarial Value of Assets

(Dollars in Millions)			PERS 1	PERS 2/3	TRS 1	TRS 2/3	SERS 2/3
a. Adjusted Market Value at 6/30/2021			$9,626	$59,057	$7,177	$22,782	$8,660
Deferred Gains and (Losses)							
Ending	**Period**	**Remaining**					
6/30/2021	8	7	1,557	9,468	1,160	3,643	1,385
6/30/2020*	3,4	1,2	($115)	($422)	($86)	($159)	($61)
6/30/2019	2	0	0	0	0	0	0
6/30/2018	3	0	0	0	0	0	0
6/30/2017	7	2	119	560	101	199	78
b. Total Deferral			**$1,561**	**$9,606**	**$1,176**	**$3,684**	**$1,402**
c. Market Value less Deferral (a - b)			$8,064	$49,451	$6,001	$19,098	$7,257
d. 70% of Market Value of Assets			$6,738	$41,340	$5,024	$15,947	$6,062
e. 130% of Market Value of Assets			$12,514	$76,775	$9,330	$29,616	$11,258
f. Actuarial Value of Assets**			**$8,064**	**$49,451**	**$6,001**	**$19,098**	**$7,257**

Note: Totals may not agree due to rounding. The gain/(loss) for plan years not shown has been fully recognized.

**Plans 1 equal four year smoothing; all other plans equal three year smoothing period.*

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

Calculation of Actuarial Value of Assets *(Continued)*

(Dollars in Millions)			PSERS 2	LEOFF 1	LEOFF 2	WSPRS 1/2	Total
a. Adjusted Market Value at 6/30/2021			$1,200	$7,343	$19,637	$1,775	$137,256
Deferred Gains and (Losses)							
Ending	**Period**	**Remaining**					
6/30/2021	8	7	186	1,196	3,083	286	21,966
6/30/2020*	3,4	1,2	(7)	(89)	(135)	(13)	(1,086)
6/30/2019	2	0	0	0	0	0	0
6/30/2018	3	0	0	0	0	0	0
6/30/2017	7	2	8	93	194	19	1,371
b. Total Deferral			**$187**	**$1,200**	**$3,142**	**$292**	**$22,251**
c. Market Value less Deferral (a - b)			$1,013	$6,143	$16,494	$1,483	$115,005
d. 70% of Market Value of Assets			840	5,140	13,746	1,242	96,080
e. 130% of Market Value of Assets			1,561	9,546	25,528	2,307	178,433
f. Actuarial Value of Assets**			**$1,013**	**$6,143**	**$16,494**	**$1,483**	**$115,005**

Note: Totals may not agree due to rounding. The gain/(loss) for plan years not shown has been fully recognized.

**Plans 1 equal four year smoothing; all other plans equal three year smoothing period.*

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

Investment Gains and (Losses) for Fiscal Year 2021					
(Dollars in Millions)	**PERS 1**	**PERS 2/3***	**TRS 1**	**TRS 2/3***	**SERS 2/3***
a. 2020 Market Value**	$7,679	$44,703	$5,735	$17,008	$6,499
b. Total Cash Flow	(445)	136	(342)	315	78
c. 2021 Market Value**	9,572	59,017	7,136	22,774	8,650
d. Actual Return (c - b - a)	**$2,338**	**$14,179**	**$1,743**	**$5,451**	**$2,074**
e. Weighted Asset Amount	$7,454	$44,768	$5,563	$17,167	$6,538
f. Expected Return (7.5% x e)	559	3,358	417	1,288	490
g. Investment Gain/(Loss) for Prior Year (d - f)	$1,779	$10,821	$1,326	$4,163	$1,583
h. Dollar-Weighted Rate of Return**	31.33%	31.67%	31.31%	31.76%	31.73%

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 Fiscal Year 2021 *(Continued)*					
(Dollars in Millions)	**PSERS 2**	**LEOFF 1**	**LEOFF 2**	**WSPRS**	**Total**
a. **2020 Market Value***	$832	$5,917	$14,528	$1,383	$104,283
b. **Total Cash Flow**	89	(372)	(7)	(40)	(588)
c. **2021 Market Value***	1,199	7,342	19,121	1,773	136,583
d. Actual Return (c - b - a)	**$279**	**$1,797**	**$4,599**	**$429**	**$32,889**
e. **Weighted Asset Amount**	$875	$5,733	$14,530	$1,364	$103,991
f. **Expected Return (7.5% x e)****	66	430	1,075	102	7,785
g. **Investment Gain/(Loss) for Prior Year (d - f)**	$213	$1,367	$3,524	$327	$25,104
h. **Dollar-Weighted Rate of Return***	31.91%	31.32%	31.65%	31.46%	31.62%

Note: Totals may not agree due to rounding.

**Source: Washington State Investment Board.*

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

Investment Gains and (Losses) for Fiscal Year 2020					
(Dollars in Millions)	**PERS 1**	**PERS 2/3***	**TRS 1**	**TRS 2/3***	**SERS 2/3***
a. 2019 Market Value**	$7,800	$42,325	$5,841	$15,506	$5,994
b. Total Cash Flow	(462)	249	(360)	307	102
c. 2020 Market Value**	7,679	44,506	5,735	16,529	6,372
d. Actual Return (c - b - a)	**$340**	**$1,932**	**$254**	**$716**	**$276**
e. Weighted Asset Amount	$7,592	$42,566	$5,678	$15,700	$6,060
f. Expected Return (7.5% x e)	569	3,192	426	1,178	454
g. Investment Gain/(Loss) for Prior Year (d - f)	($229)	($1,261)	($172)	($462)	($179)
h. Dollar-Weighted Rate of Return**	4.48%	4.54%	4.47%	4.56%	4.55%

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 Fiscal Year 2020 *(Continued)*					
(Dollars in Millions)	**PSERS 2**	**LEOFF 1**	**LEOFF 2**	**WSPRS**	**Total**
a. 2019 Market Value*	$715	$6,028	$14,159	$1,361	$99,729
b. Total Cash Flow	81	(373)	(258)	(38)	(752)
c. 2020 Market Value*	832	5,917	14,528	1,383	103,479
d. Actual Return (c - b - a)	**$35**	**$262**	**$627**	**$61**	**$4,502**
e. Weighted Asset Amount	$757	$5,861	$13,937	$1,346	$99,497
f. Expected Return (7.5% x e)**	57	440	1,031	101	7,448
g. Investment Gain/(Loss) for Prior Year (d - f)	($22)	($178)	($404)	($40)	($2,947)
h. Dollar-Weighted Rate of Return*	4.62%	4.47%	4.50%	4.50%	4.52%

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 Annual Comprehensive 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 Plan 2, the valuation interest rate is prescribed by the PFC and is subject to revision by the Legislature. For LEOFF Plan 2, the valuation interest rate is prescribed by the LEOFF Plan 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 2020 and 2021 investment gains or losses, we used an investment return assumption corresponding to the time investment returns were realized of 7.5 percent (7.4 percent for LEOFF Plan 2). Future calculations will use the new investment return assumption of 7.0 percent for all systems. 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 our Interactive Reports webpage for funded status measures that vary by interest rate assumptions and asset valuation methods.

Funded Status on an Actuarial Value Basis*

(Dollars in Millions)	PERS		TRS		SERS
	Plan 1	Plans 2/3	Plan 1	Plans 2/3	Plan 2/3
Accrued Liability	$11,368	$52,039	$8,257	$21,312	$7,958
Valuation Assets	$8,064	$49,451	$6,001	$19,098	$7,257
Unfunded Liability	**$3,303**	**$2,588**	**$2,256**	**$2,214**	**$701**
Funded Ratio					
2021	**71%**	**95%**	**73%**	**90%**	**91%**
2020	69%	98%	71%	93%	93%
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 7.0%. All assets have been valued under the actuarial asset method.*

Funded Status on an Actuarial Value Basis* *(Continued)*

(Dollars in Millions)	PSERS	LEOFF		WSPRS	Total
	Plan 2	Plan 1	Plan 2	Plans 1/2	
Accrued Liability	$1,039	$4,209	$15,819	$1,620	$123,621
Valuation Assets	$1,013	$6,143	$16,494	$1,483	$115,005
Unfunded Liability	**$26**	**($1,934)**	**($676)**	**$137**	**$8,616**
Funded Ratio					
2021	**98%**	**146%**	**104%**	**92%**	**93%**
2020	101%	148%	113%	97%	95%
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 7.0%. All assets have been valued under the actuarial asset method.*

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

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

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 (longer lifespans than our best estimate) and assumed no future improvements (shorter lifespans than our best estimate). The following tables 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	$115,728	$123,621	$131,630
Valuation Assets	$115,005	$115,005	$115,005
Unfunded Liability	$722	$8,616	$16,624
Funded Ratio	99%	93%	87%

Sensitivity of Funded Ratios to Interest Rates			
(Dollars in Millions)	**1% Lower 6.0%**	**Best Estimate 7.0%**	**1% Higher 8.0%**
Accrued Liability	$140,636	$123,621	$109,591
Valuation Assets	$115,005	$115,005	$115,005
Unfunded Liability	$25,630	$8,616	($5,415)
Funded Ratio	82%	93%	105%

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 biennial 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**
2019 Normal Cost Before Laws of 2020	**6.36%**	**8.05%**	**7.76%**
Remove Rate Floor	0.00%	0.00%	0.00%
Remove Prior Employer Liability	0.00%	0.00%	0.00%
2019 Adjusted Normal Cost Rate	**6.36%**	**8.05%**	**7.76%**
Liabilities			
Salaries	0.29%	(0.19%)	(0.11%)
Termination	0.04%	(0.07%)	(0.20%)
Retirement	0.01%	0.02%	0.03%
Disability	0.02%	0.01%	0.02%
Mortality	0.04%	0.01%	0.01%
Growth / Return to Work	1.52%	1.63%	1.88%
New TAP 3 Annuity Purchases	0.05%	0.13%	0.13%
Other Liabilities	0.05%	(0.03%)	(0.05%)
Total Liability Gains/Losses	**2.02%**	**1.51%**	**1.71%**
Assets*			
Contributions	(0.01%)	0.29%	0.33%
New TAP 3 Annuity Purchases	(0.04%)	(0.12%)	(0.13%)
Disbursements	0.08%	0.03%	0.08%
Investment Returns	(1.50%)	(0.90%)	(1.28%)
Total Asset Gains/Losses	**(1.47%)**	**(0.70%)**	**(0.99%)**
Incremental Changes			
Plan Change	0.00%	0.00%	0.00%
Method Change	0.00%	0.00%	0.00%
Assumption Change	0.02%	0.02%	0.02%
Correction Change	(0.01%)	0.00%	0.00%
Experience Study Change	2.04%	1.83%	1.86%
Total Incremental Changes Gains/Losses	**2.05%**	**1.85%**	**1.88%**
Present Value of Future Salaries Gains/Losses	**(1.77%)**	**(1.60%)**	**(1.92%)**
Other Gains/Losses	**0.01%**	**0.06%**	**0.03%**
Total Change	**0.84%**	**1.12%**	**0.71%**
2021 Preliminary Normal Cost	**7.20%**	**9.17%**	**8.47%**
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	0.00%	0.53%	0.00%
Laws of 2022	0.00%	0.00%	0.00%
2021 Adjusted Normal Cost	**7.20%**	**9.70%**	**8.47%**

Note: Totals may not agree due to rounding.

**Asset Gain/Loss performed on AVA not MVA.*

Change in Employer and State Plan 2/3 Normal Cost Rate by Source
(Continued)

Change in Normal Costs	PSERS	LEOFF[1]	WSPRS[2]
2019 Normal Cost Before Laws of 2020	**6.50%**	**7.68%**	**18.41%**
Remove Rate Floor	0.00%	(1.87%)	0.00%
Remove Prior Employer Liability[3]	0.00%	0.00%	(5.64%)
2019 Adjusted Normal Cost Rate	**6.50%**	**5.81%**	**12.77%**
Liabilities			
Salaries	0.26%	0.34%	(0.47%)
Termination	(0.33%)	(0.06%)	(0.08%)
Retirement	0.02%	0.14%	(0.09%)
Disability	0.01%	0.00%	0.06%
Mortality	0.02%	0.01%	0.23%
Growth / Return to Work	3.17%	1.64%	1.96%
Other Liabilities	(0.09%)	0.19%	1.01%
Total Liability Gains/Losses	**3.06%**	**2.26%**	**2.62%**
Assets[4]			
Contributions	(0.19%)	(0.29%)	0.87%
Disbursements	0.06%	0.16%	0.17%
Investment Returns	(0.41%)	(1.71%)	(3.63%)
Total Asset Gains/Losses	**(0.54%)**	**(1.84%)**	**(2.58%)**
Incremental Changes			
Plan Change	0.00%	1.62%	0.02%
Method Change	0.00%	0.00%	0.00%
Assumption Change	0.00%	0.00%	0.62%
Correction Change	0.00%	0.00%	0.00%
Experience Study Change	1.11%	1.94%	4.92%
Total Incremental Changes Gains/Losses	**1.11%**	**3.56%**	**5.56%**
Present Value of Future Salaries Gains/Losses	**(2.78%)**	**(1.13%)**	**(2.32%)**
Other Gains/Losses	**0.01%**	**(0.01%)**	**0.13%**
Total Change	**0.86%**	**2.84%**	**3.41%**
2021 Preliminary Normal Cost	**7.36%**	**8.65%**	**16.18%**
Increase from Applied Rate Floor	0.00%	1.29%	0.00%
Rate to Amortize Prior Employer Liability	0.00%	0.00%	0.35%
Excess Member Rate	0.00%	0.00%	7.57%
Laws of 2022	0.10%	0.00%	0.00%
2021 Adjusted Normal Cost	**7.46%**	**9.94%**	**24.10%**

Note: Totals may not agree due to rounding.

[1] The LEOFF contribution rate represents the sum of the employer and state contribution rates. This rate is split 60/40 between local employers and the state.

[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 (4.32%), 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, and PSERS[2]**	**TRS**	**LEOFF[3]**
2019 UAAL Rate Before Laws of 2020	**3.60%**	**5.96%**	**(27.53%)**
Remove Rate Floor	(0.54%)	(1.59%)	0.00%
Remove Plan 1 Benefit Improvements	(0.10%)	(0.21%)	N/A
Fixed Amortization Date Adjustment[4]	N/A	N/A	(50.81%)
2019 Adjusted UAAL Rate	**2.96%**	**4.16%**	**(78.34%)**
Liabilities	**0.00%**	**0.00%**	**0.00%**
Salaries	0.00%	0.00%	0.00%
Termination	0.00%	0.00%	0.00%
Retirement	0.00%	(0.01%)	(0.05%)
Disability	0.00%	0.00%	0.00%
Mortality	0.02%	0.04%	(0.52%)
Return to Work	0.00%	0.00%	0.00%
Inflation (CPI)	0.00%	0.00%	(2.48%)
Other Liabilities	0.01%	0.01%	1.70%
Total Liability Gains/Losses	**0.03%**	**0.04%**	**(1.35%)**
Assets[5]	**0.00%**	**0.00%**	**0.00%**
Contributions	(0.36%)	(0.63%)	(0.00%)
Disbursements	(0.00%)	0.01%	(0.24%)
Investment Returns	(0.46%)	(0.75%)	(16.51%)
Total Asset Gains/Losses	**(0.82%)**	**(1.36%)**	**(16.75%)**
Incremental Changes	**0.00%**	**0.00%**	**0.00%**
Plan Change	0.12%	0.22%	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	0.31%	0.51%	2.78%
Total Incremental Changes Gains/Losses	**0.43%**	**0.73%**	**2.78%**
Present Value of Future Salaries Gains/Losses	**(0.57%)**	**(0.71%)**	**(0.99%)**
Other Gains/Losses	**0.01%**	**(0.14%)**	**0.21%**
Total Change	**(0.92%)**	**(1.44%)**	**(16.10%)**
2021 Preliminary UAAL Rate	**2.04%**	**2.72%**	**(94.44%)**
Increase from Applied Rate Floor	1.46%	3.03%	0.00%
Increase from Plan 1 Benefit Improvements	0.21%	0.44%	N/A
Laws of 2022	0.14%	0.27%	7.92%
2021 Adjusted UAAL Rate	**3.85%**	**6.46%**	**(86.52%)**

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 June 30, 2024.

[5] Asset Gain/Loss performed on AVA not MVA.

III. PARTICIPANT DATA

OVERVIEW OF SYSTEM MEMBERSHIP

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

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

In addition to the six systems described above, the state also administers benefits for several other retirement systems that are not covered in this report. The results of these valuations are prepared by OSA in separate reports:

- The Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Plan is open to new volunteers and is administered by the Board for Volunteer Fire Fighters and Reserve Officers. This plan also provides medical benefits for duty-related injuries.
- The two Judicial systems closed to new members in 1988; see the DRS Annual Comprehensive Financial Report for details. New judges become members of PERS Plans 2/3.
- The Higher Education Supplemental Retirement Plans are offered to certain employees of colleges and universities in Washington. These plans were closed to new members by July 1, 2011.

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

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

Reconciliation of Active and Annutant Data								
	PERS				TRS			
	Plan 1	Plan 2	Plan 3	Total	Plan 1	Plan 2	Plan 3	Total
2019 Actives	1,538	122,454	38,047	162,039	350	21,561	55,351	77,262
Transfers	0	(306)	308	2	0	(27)	126	99
Hires/Rehires	67	26,267	9,949	36,283	5	5,717	6,610	12,332
New Retirees	(644)	(6,934)	(906)	(8,484)	(179)	(508)	(1,801)	(2,488)
Deaths	(13)	(435)	(106)	(554)	(4)	(29)	(91)	(124)
Terminations	(73)	(16,398)	(9,183)	(25,654)	(8)	(2,548)	(5,068)	(7,624)
2021 Actives	**875**	**124,648**	**38,109**	**163,632**	**164**	**24,166**	**55,127**	**79,457**
2019 Annuitants	45,633	54,948	5,684	106,265	32,570	5,855	13,701	52,126
New Retirees	842	10,528	1,542	12,912	231	893	3,300	4,424
Annuitant Deaths	(4,290)	(2,749)	(150)	(7,189)	(2,513)	(238)	(231)	(2,982)
New Survivors	574	795	84	1,453	420	62	138	620
Other	(33)	(41)	(3)	(77)	(25)	(1)	(16)	(42)
2021 Annuitants	**42,726**	**63,481**	**7,157**	**113,364**	**30,683**	**6,571**	**16,892**	**54,146**
Ratio Actives to Annuitants	**0.02**	**1.96**	**5.32**	**1.44**	**0.01**	**3.68**	**3.26**	**1.47**

Reconciliation of Active and Annuitant Data *(Continued)*				
	SERS			PSERS
	Plan 2	Plan 3	Total	Plan 2
2019 Actives	28,239	35,527	63,766	7,758
Transfers	(116)	206	90	0
Hires/Rehires	7,594	6,778	14,372	3,335
New Retirees	(1,476)	(1,427)	(2,903)	(131)
Deaths	(94)	(94)	(188)	(14)
Terminations	(5,461)	(7,481)	(12,942)	(1,816)
2021 Actives	**28,686**	**33,509**	**62,195**	**9,132**
2019 Annuitants	10,056	9,987	20,043	296
New Retirees	2,457	2,525	4,982	166
Annuitant Deaths	(414)	(300)	(714)	(4)
New Survivors	129	111	240	1
Other	(9)	(3)	(12)	0
2021 Annuitants	**12,219**	**12,320**	**24,539**	**459**
Ratio Actives to Annuitants	**2.35**	**2.72**	**2.53**	**19.90**

Reconciliation of Active and Annutant Data *(Continued)*	LEOFF			WSPRS			All
	Plan 1	Plan 2	Total	Plan 1	Plan 2	Total	Systems
2019 Actives	20	18,557	18,577	397	646	1,043	330,445
Transfers	0	0	0	0	0	0	191
Hires/Rehires	0	2,489	2,489	0	122	122	68,933
New Retirees	(7)	(1,377)	(1,384)	(77)	(1)	(78)	(15,468)
Deaths	0	(29)	(29)	(1)	(1)	(2)	(911)
Terminations	0	(957)	(957)	(1)	(31)	(32)	(49,025)
2021 Actives	**13**	**18,683**	**18,696**	**318**	**735**	**1,053**	**334,165**
2019 Annuitants	6,891	6,064	12,955	1,181	0	1,181	192,866
New Retirees	8	1,582	1,590	83	2	85	24,159
Annuitant Deaths	(604)	(107)	(711)	(41)	0	(41)	(11,641)
New Survivors	228	64	292	18	1	19	2,625
Other	(7)	(29)	(36)	2	0	2	(165)
2021 Annuitants	**6,516**	**7,574**	**14,090**	**1,243**	**3**	**1,246**	**207,844**
Ratio Actives to Annuitants	**0.00**	**2.47**	**1.33**	**0.26**	**245.00**	**0.85**	**1.61**

SUMMARY OF PLAN PARTICIPANTS

Summary of Plan Participants								
PERS	2021				2019			
	Plan 1	Plan 2	Plan 3	Plans 2/3	Plan 1	Plan 2	Plan 3	Plans 2/3
Active Members								
Number	875	124,648	38,109	162,757	1,538	122,454	38,047	160,501
Total Salaries *(Dollars in Millions)*	$62	$9,430	$2,739	$12,169	$105	$8,582	$2,449	$11,031
Average Age	68.4	47.3	44.2	46.6	66.6	47.7	43.3	46.7
Average Service	26.2	11.6	8.8	10.9	26.2	11.9	8.2	11.0
Average Salary	$70,726	$75,650	$71,871	$74,765	$68,120	$70,079	$64,368	$68,725
Terminated Members								
Vested	240	29,001	6,705	35,706	396	28,726	6,286	35,012
Non-Vested*	2,275	122,008	0	122,008	2,529	113,586	0	113,586
Total Terminated	**2,515**	**151,009**	**6,705**	**157,714**	**2,925**	**142,312**	**6,286**	**148,598**
Annuitants								
Service Retired**	36,920	57,657	6,674	64,331	39,521	49,549	5,280	54,829
Disability Retired	655	1,776	96	1,872	754	1,869	92	1,961
Survivors	5,151	4,048	387	4,435	5,358	3,530	312	3,842
Total Annuitants	**42,726**	**63,481**	**7,157**	**70,638**	**45,633**	**54,948**	**5,684**	**60,632**
Avg. Monthly Benefit, All Annuitants***	$2,284	$1,986	$1,087	$1,895	$2,159	$1,777	$990	$1,703
Number of New Service Retirees	378	5,288	786	6,074	597	5,034	713	5,747
Avg. Benefit, New Service Retirees***	$2,712	$2,517	$1,230	$2,351	$2,492	$2,275	$1,173	$2,139

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	**2021**				**2019**			
	Plan 1	**Plan 2**	**Plan 3**	**Plans 2/3**	**Plan 1**	**Plan 2**	**Plan 3**	**Plans 2/3**
Active Members								
Number	164	24,166	55,127	79,293	350	21,561	55,351	76,912
Total Salaries *(Dollars in Millions)*	$18	$2,027	$5,422	$7,449	$36	$1,687	$5,080	$6,767
Average Age	70.1	41.7	46.8	45.3	68.0	41.6	46.3	45.0
Average Service	34.4	7.8	14.7	12.6	33.4	7.6	14.1	12.3
Average Salary	$110,479	$83,869	$98,350	$93,936	$102,091	$78,259	$91,770	$87,982
Terminated Members								
Vested	82	3,042	8,503	11,545	119	2,823	8,831	11,654
Non-Vested*	224	7,852	0	7,852	243	7,140	0	7,140
Total Terminated	**306**	**10,894**	**8,503**	**19,397**	**362**	**9,963**	**8,831**	**18,794**
Annuitants								
Service Retired**	27,440	6,205	16,126	22,331	29,275	5,532	13,058	18,590
Disability Retired	403	75	96	171	453	82	97	179
Survivors	2,840	291	670	961	2,842	241	546	787
Total Annuitants	**30,683**	**6,571**	**16,892**	**23,463**	**32,570**	**5,855**	**13,701**	**19,556**
Avg. Monthly Benefit, All Annuitants***	$2,362	$2,282	$1,411	$1,655	$2,262	$2,098	$1,272	$1,519
Number of New Service Retirees	108	489	1,694	2,183	177	472	1,784	2,256
Avg. Benefit, New Service Retirees***	$3,876	$2,669	$1,714	$1,928	$3,466	$2,512	$1,531	$1,736

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	2021			2019		
	Plan 2	Plan 3	Plans 2/3	Plan 2	Plan 3	Plans 2/3
Active Members						
Number	28,686	33,509	62,195	28,239	35,527	63,766
Total Salaries *(Dollars in Millions)*	$1,185	$1,403	$2,588	$1,087	$1,365	$2,453
Average Age	49.0	49.6	49.3	49.5	49.0	49.2
Average Service	8.5	10.1	9.3	8.7	9.5	9.1
Average Salary	$41,295	$41,873	$41,606	$38,505	$38,427	$38,462
Terminated Members						
Vested	6,662	9,405	16,067	6,222	9,049	15,271
Non-Vested*	19,773	0	19,773	16,768	0	16,768
Total Terminated	**26,435**	**9,405**	**35,840**	**22,990**	**9,049**	**32,039**
Annuitants						
Service Retired**	11,385	11,756	23,141	9,323	9,512	18,835
Disability Retired	269	90	359	274	93	367
Survivors	565	474	1,039	459	382	841
Total Annuitants	**12,219**	**12,320**	**24,539**	**10,056**	**9,987**	**20,043**
Avg. Monthly Benefit, All Annuitants***	$1,006	$566	$785	$941	$523	$733
Number of New Service Retirees	1,280	1,275	2,555	1,012	1,174	2,186
Avg. Benefit, New Service Retirees***	$1,052	$629	$841	$1,027	$585	$790

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)*		
PSERS	**2021**	**2019**
Active Members		
Number	9,132	7,758
Total Salaries *(Dollars in Millions)*	$684	$529
Average Age	40.8	40.4
Average Service	5.8	5.4
Average Salary	$74,920	$68,236
Terminated Members		
Vested	796	629
Non-Vested*	4,521	2,856
Total Terminated	**5,317**	**3,485**
Annuitants		
Service Retired**	424	266
Disability Retired	22	18
Survivors	13	12
Total Annuitants	**459**	**296**
Avg. Monthly Benefit, All Annuitants	$1,092	$900
Number of New Service Retirees	92	60
Avg. Benefit, New Service Retirees	$1,424	$1,117

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	**2021**			**2019**		
	Plan 1	**Plan 2**	**Total**	**Plan 1**	**Plan 2**	**Total**
Active Members						
Number	13	18,683	18,696	20	18,557	18,577
Total Salaries *(Dollars in Millions)*	$2	$2,289	$2,291	$2	$2,117	$2,119
Average Age	68.3	42.3	42.4	67.8	42.8	42.8
Average Service	43.2	13.1	13.1	43.3	13.6	13.6
Average Salary	$126,512	$122,513	$122,516	$106,597	$114,085	$114,077
Terminated Members						
Vested	0	1,115	1,115	1	969	970
Non-Vested*	26	2,626	2,652	27	2,193	2,220
Total Terminated	**26**	**3,741**	**3,767**	**28**	**3,162**	**3,190**
Annuitants						
Service Retired**	2,172	6,698	8,870	2,322	5,312	7,634
Disability Retired	2,658	543	3,201	2,904	473	3,377
Survivors	1,686	333	2,019	1,665	279	1,944
Total Annuitants	**6,516**	**7,574**	**14,090**	**6,891**	**6,064**	**12,955**
Avg. Monthly Benefit, All Annuitants	$4,719	$4,684	$4,692	$4,507	$4,260	$4,392
Number of New Service Retirees***	2	821	823	6	614	620
Avg. Benefit, New Service Retirees***	$10,109	$5,597	$5,608	$8,800	$4,942	$4,980

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.*

Summary of Plan Participants *(Continued)*						
WSPRS	**2021**			**2019**		
	Plan 1	**Plan 2**	**Total**	**Plan 1**	**Plan 2**	**Total**
Active Members						
Number	318	735	1,053	397	646	1,043
Total Salaries *(Dollars in Millions)*	$40	$75	$115	$47	$62	$109
Average Age	50.4	34.7	39.5	49.2	33.8	39.7
Average Service	23.6	8.6	13.1	22.3	7.8	13.3
Average Salary	$126,512	$101,438	$109,010	$119,395	$95,495	$104,592
Terminated Members						
Vested	62	44	106	69	37	106
Non-Vested*	16	77	93	17	64	81
Disability Retired**	35	0	35	37	0	37
Total Terminated	**113**	**121**	**234**	**123**	**101**	**224**
Annuitants						
Service Retired***	1,054	2	1,056	996	0	996
Survivors	189	1	190	185	0	185
Total Annuitants	**1,243**	**3**	**1,246**	**1,181**	**0**	**1,181**
Avg. Monthly Benefit, All Annuitants	$4,996	$959	$4,851	$4,611	$0	$4,611
Number of New Service Retirees	56	1	57	46	0	46
Avg. Benefit, New Service Retirees	$6,483	$524	$6,378	$6,187	$0	$6,187

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.*

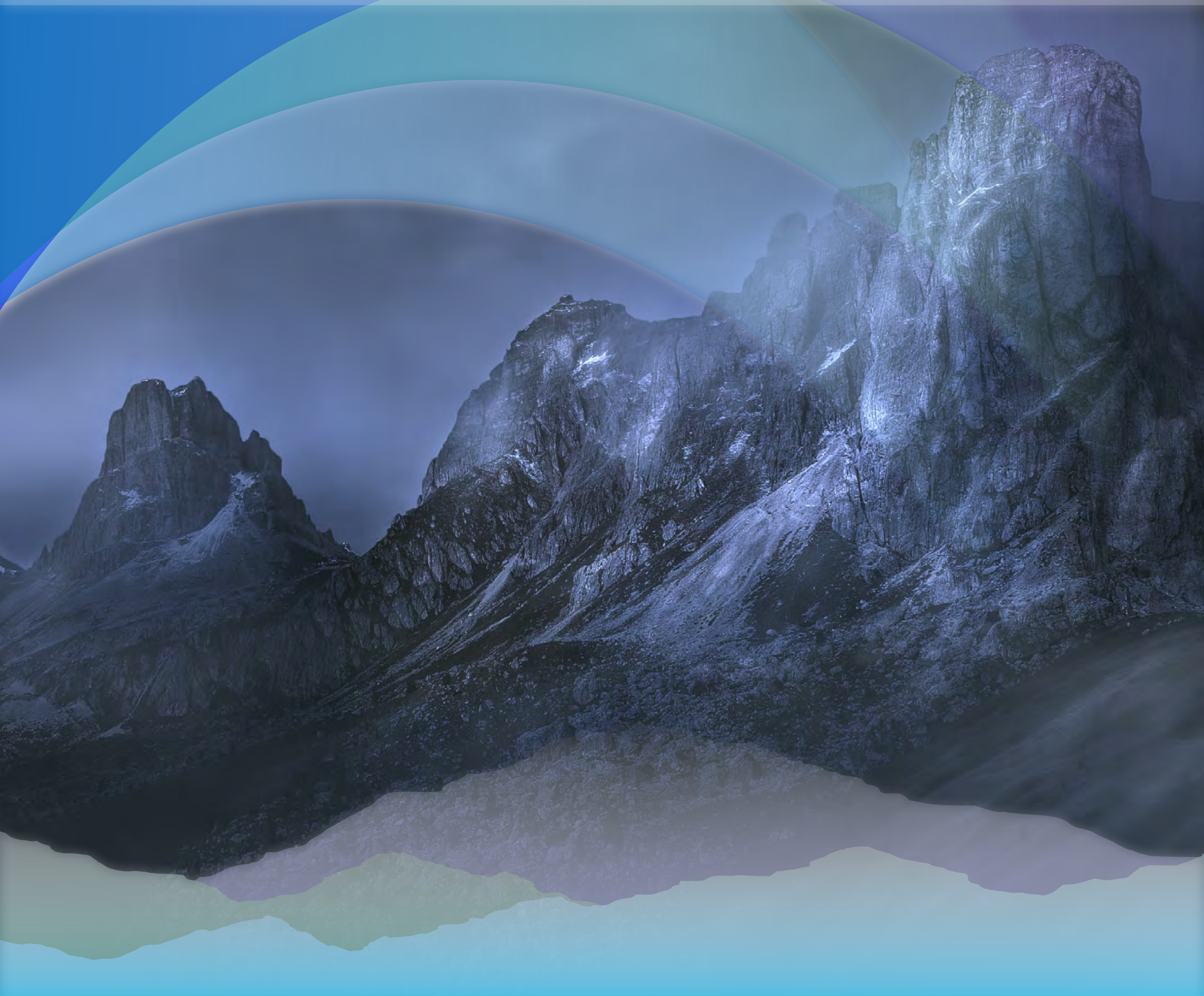
****Includes retirements from active and terminated with vested status.*

The following table provides summary statistics for Plan 3 retirees of PERS, TRS, and SERS purchasing Total Allocation Portfolio (TAP) annuities. These annuities are purchased from a member's defined contribution account. Assets and liabilities for TAP annuities are included in the funded ratio and contribution rate calculations. Please see the DRS website for more information on TAP and other types of annuities offered by the retirement systems.

Summary of Members Purchasing TAP Annuities			
	PERS 3	**TRS 3**	**SERS 3**
Number	964	2,053	1,158
Average Age	67.2	68.0	69.2
Avg. Monthly Benefit, All Annuitants	$1,392	$1,508	$750
Number of New Purchasers in FY 2021	104	177	114
Avg. Purchase Price, New Purchasers*	$286,900	$295,100	$133,600
Avg. Monthly Benefit, New Purchasers	$1,508	$1,558	$750

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

IV. APPENDICES



ACTUARIAL METHODS AND ASSUMPTIONS

To calculate the contribution rates necessary to pre-fund a plan's benefits, an actuary uses an actuarial cost method, a funding policy, economic assumptions, and demographic assumptions. The actuary may also use an asset valuation method other than market value. The section below list the methods and assumptions that change regularly or are new since the last rate-setting valuation report. Please see our Actuarial Methods webpage for descriptions of the actuarial cost methods and asset valuation method we use for this valuation, and please see our Actuarial Assumptions webpage for descriptions of all remaining assumptions.

CHANGES IN METHODS AND ASSUMPTIONS SINCE THE LAST RATE-SETTING VALUATION

- We updated the Joint-and-Survivor Factors and Early Retirement Factors in our model. These factors are used to value benefits for early retirement and survivors of members that are deceased prior to retirement. These factors match the administrative factors recently provided to DRS for future implementation that reflect current demographic and economic assumptions.
- We updated the economic assumptions based on the 2021 action of the PFC and the LEOFF Plan 2 Retirement Board. The investment return assumption was reduced from 7.50 (7.40 for LEOFF 2) to 7.00 percent, and the salary growth assumption was lowered from 3.50 to 3.25 percent. This action is a result of recommendations from our biennial economic experience study; please see the full report for additional details.
- We adjusted the LEOFF 2 liabilities, plan assets, and funding policy based on the passage of SHB 1701. This bill provided an increase to pension benefits, moved assets from the LEOFF 2 benefit improvement account to the trust fund available to fund current law benefits, and adjusted minimum contribution rate policy. Please see our fiscal note for the details on these new plan provisions and our website for changes in our assumptions.
- We increased the WSPRS general salary growth assumption for FY 2023 from 3.25 to 10.00 percent consistent with the increases included in the 2022 supplemental budget (Chapter 297, Laws of 2022, Sec 913 [2] and 914 [2]). It's our understanding this increase will apply to all troopers and will be granted in addition to other salary increases for experience and promotions. Therefore, we did not adjust our service-based salary increases assumption.
- We considered but did not make changes to our model to reflect the following:
  - SB 5021 passed in the 2021 Legislative Session to provide pension benefit protection for members experiencing reductions in pay or service due to the COVID-19 budgetary crisis. Available data suggests furloughs tended to be significantly less than initially anticipated by the state and our fiscal note. As such, we did not make an adjustment within our model to reflect this legislation.
  - Approximately 6.5 percent of WSPRS active members terminated in October 2021 when failing to meet the Governor's vaccination mandate. It's unclear if these members have the option to rehire after receiving the vaccine or were (or will be) replaced by new hires. Given the uncertainty in status and the experience occurring after our measurement date, we chose not to reflect this (or similar plan experience from other systems) in our model.

COMMENTS ON VALUATION MODEL

As required under ASOP No. 56 – Modeling, we share the following comments related to our reliance on the ProVal® software developed by Winklevoss Technologies.

- We understand this software model was primarily created for use by actuaries when performing valuations and projections of pension and retiree medical plans. The use of the model for this analysis is appropriate given it's intended purpose.
- To assess the general operation of the model, we reviewed the output for reasonableness. This includes comparing the results to our simplified estimates done in Microsoft Excel and examining sample lives to confirm the programming is working as intended. We are not aware of any known weaknesses or limitations of the model that have a material impact on the results.
- The PFC hires auditors to independently review and replicate the results of rate-setting valuations. This process provides an additional reasonableness check of the model output.

Additionally, we considered how the use of different inputs to the model (e.g., data, assumptions, provisions) produce different results and evaluated the relative impacts to our expectations. This allows us to gain a deeper knowledge of the model's important dependencies and major sensitivities.

SUMMARY OF PLAN PROVISIONS

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

These tables 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.

Summary of Frequently Changing Plan Provisions

PERS	Plan 1	Plan 2	Plan 3
COLA	$2.69* per Month per YOS on 7/1/22	Lesser of CPI** or 3%	Lesser of CPI** or 3%
Minimum Benefit per Month	$70.18 per YOS on 7/1/22, $2,138.63* for Select Annuitants	N/A	N/A
Material Plan Provision Changes since Last Rate-Setting Valuation	Plan 1 COLA 3% Increase (C 52, L 22)	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 *(Continued)*

TRS	Plan 1	Plan 2	Plan 3
COLA	$2.69* per Month per YOS on 7/1/22	Lesser of CPI** or 3%	Lesser of CPI** or 3%
Minimum Benefit per Month	$70.18 per YOS on 7/1/22, $2,138.63* for Select Annuitants	N/A	N/A
Material Plan Provision Changes since Last Rate-Setting Valuation	Plan 1 COLA 3% Increase (C 52, L 22)	None	None
Significant Plan Provisions Not Included in This Valuation	$800 Million UAAL Payment*** (C 334, L 21, Sec 747)	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.*
****Under current law, this payment occurs after the measurement date and will be reflected in our next rate-setting valuation.*

Summary of Frequently Changing Plan Provisions *(Continued)*

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 Rate-Setting 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 Provisions *(Continued)*	
PSERS	**Plan 2**
COLA	Lesser of CPI* or 3%
Minimum Benefit per Month	N/A
Material Plan Provision Changes since Last Rate-Setting Valuation	Expanded Disability Benefits (C 22 L 22)
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 *(Continued)*		
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 Rate-Setting Valuation	Lump Sum Payment (C 168 L 22)	Benefit Improvement / New Minimum Funding Policy (C 125 L 22)
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 Provisions *(Continued)*		
WSPRS	**Plan 1**	**Plan 2**
COLA	Lesser of CPI* or 3%	Lesser of CPI* or 3%
Minimum Benefit per Month**	$40.44 per YOS on 1/1/22	$40.44 per YOS on 1/1/22
Material Plan Provision Changes since Last Rate-Setting 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.*

***Amount increases by 3% annually.*

V. RESOURCES

THE OFFICE OF THE STATE ACTUARY'S WEBSITE

Our website 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.

2021 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.

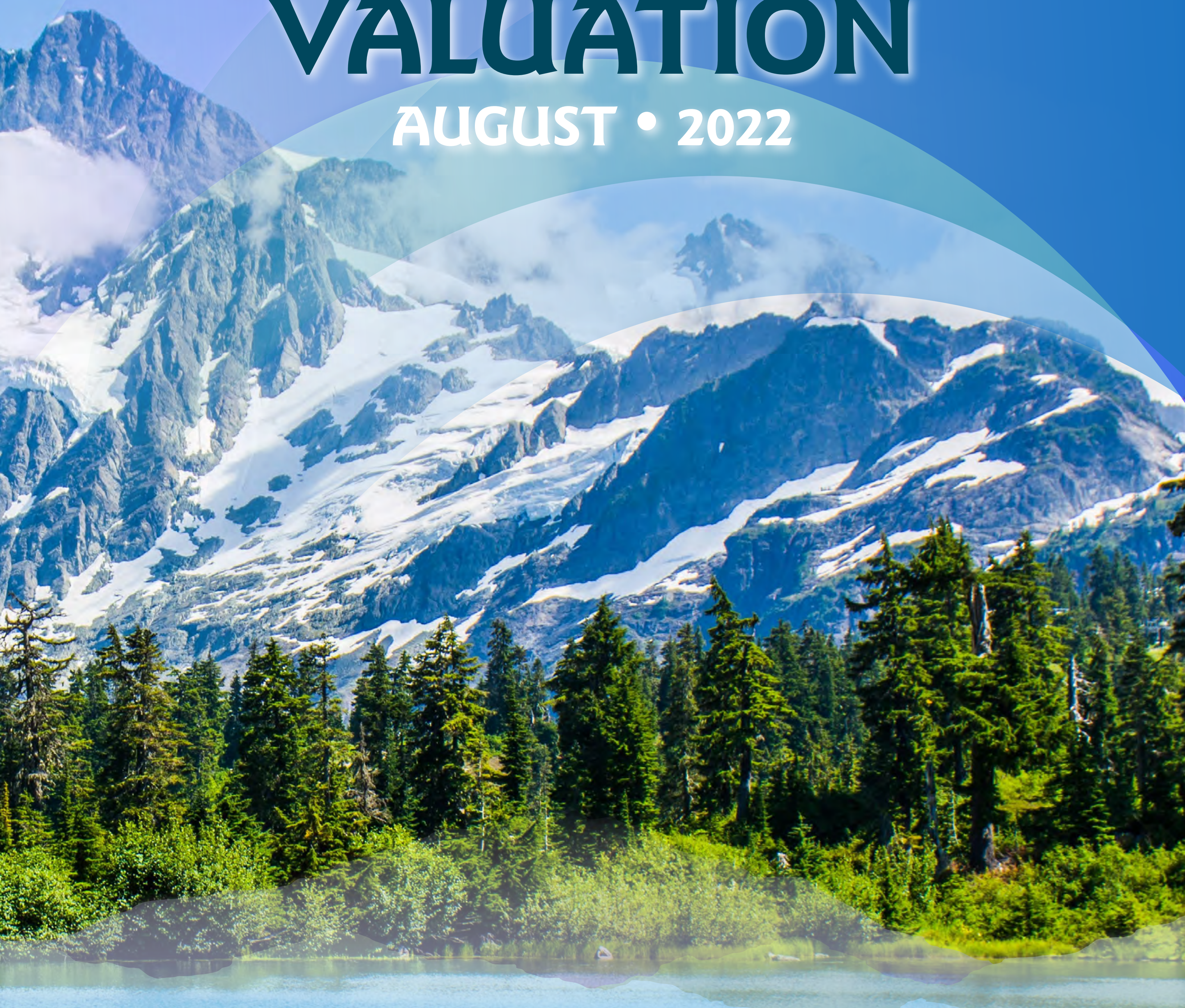
INTERACTIVE REPORTS

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

WASHINGTON STATE

2021 ACTUARIAL VALUATION

AUGUST • 2022



Office of the State Actuary

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