

2022 ACTUARIAL VALUATION

**WASHINGTON STATE
VOLUNTEER FIRE
FIGHTERS' AND
RESERVE OFFICERS'
RELIEF AND
PENSION FUND**



OCTOBER 2023



Office of the State Actuary
"Supporting financial security for generations."



BOARD FOR VOLUNTEER FIRE FIGHTERS AND RESERVE OFFICERS

Olympia Forum Building
605 E 11th Avenue #112
PO Box 114
Olympia, WA 98507

Phone: 360.753.7318
Toll Free: 877.753.7318
Fax: 360.586.1987
bvff.wa.gov

REPORT PREPARED BY THE OFFICE OF THE STATE ACTUARY



Office of the State Actuary

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

Melinda Aslakson

Sarah Baker

Katie Bennington

Kelly Burkhart

Mitch DeCamp

Cristina Diaz

Graham Dyer

Aaron Gutierrez, MPA, JD

Beth Halverson

Michael Harbour, ASA, MAAA

Kevin Lee

Luke Masselink, ASA, EA, MAAA

Darren Painter

Lindsey Russell

Frank Serra

Kyle Stineman, ASA, MAAA

Keri Wallis

Lisa Won, ASA, FCA, MAAA

2100 Evergreen Park Dr., SW Suite 150
PO Box 40914
Olympia, WA 98504-0914
leg.wa.gov/osa

Phone: 360.786.6140
TDD: 711
state.actuary@leg.wa.gov

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

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Volunteer Fire Fighters’ and Reserve Officers’ Relief and Pension Fund Actuarial Valuation Report As of June 30, 2022 October 2023

As required under [Chapter 41.24.320](#) of the Revised Code of Washington (RCW), this report documents the results of an actuarial valuation of the Washington State Volunteer Fire Fighters’ and Reserve Officers’ (VFF) Relief and Pension Fund.

The primary purpose of this valuation is to determine the pension and relief contribution requirements for the plan as of June 30, 2022, under the funding policy established by the Board for Volunteer Fire Fighters and Reserve Officers (the Board). This valuation also provides information on the funding progress and developments in the plan 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. The **Actuarial Exhibits** and **Participant Data** sections of the report provide detailed actuarial asset and liability information, as well as participant data. The **Appendix** summarizes the principal actuarial assumptions and methods, major plan provisions, and supporting information used to perform this valuation. The **Resource** section outlines additional supplemental information found on our website.

We encourage you to submit any questions you might have about 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 reference information.

Sincerely,

Michael T. Harbour, ASA, MAAA
Actuary

Frank Serra
Senior Actuarial Analyst

Section One:

Summary of Key Results



INTENDED USE

The purpose of this report is to develop contribution rates to pre-fund the pension and relief benefits based on a June 30, 2022, 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 plan over the past two years, given last year's valuation relied on projected data. 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 (and may not be appropriate) to satisfy the accounting requirements under the Governmental Accounting Standards Board (GASB) rules.

COMMENTARY ON RISK

Actuarial Standards of Practice (ASOPs) 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 and the rate of mortality for retirees. 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 funded status. These changes can affect plan risk, and these sensitivities can evolve as the plans grow and mature over time.

To help readers better understand some of these risks and their potential impacts, we have included in the Funded Status section of the **Actuarial Exhibits** the impact from changes in the investment rate of return assumption, one of our most impactful assumptions. We also speak to other risk considerations in the Commentary on Risk section of the **Actuarial Exhibits**.

FUNDING POLICY

The Board relies on systematic actuarial funding to finance the ongoing cost of the pension and relief plans. Under this financing approach, we reduce the cost of future pension and relief payments by the expected long-term return on invested contributions. The plan's assets are first allocated to pre-fund the pension benefits. Any assets above the pension plan's accrued liability are allocated to the relief plan.

The pension and relief plans are cost-sharing plans that rely on contributions from employees and employers, while the state contributes 40 percent of the annual Fire Insurance Premium Tax (FIPT) collected. Please refer to the **Appendix** for additional details on the actuarial funding methods. If all actuarial assumptions are realized and all future contributions determined 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.

Under current funding policy, certain plan costs are paid by members, employers, and the state. The actual contribution rate charged to individual members or employers is not intended to cover the full actuarial costs of the plan. However, annual plan income (including state contributions from the FIPT, but excluding investment income), continues to exceed the annual actuarial costs for the plan.

CONTRIBUTION RATES

We determine the pension and relief contribution rates as a flat dollar amount per person. The following table shows the calculated contribution rates based on the 2022 valuation, along with rates from the 2020 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 valuation that included the calculation of contribution rates.

Consistent with current Board funding policy, we calculate the per-person level dollar contribution rate needed to pre-fund pension benefits using the Entry Age Normal (EAN) Funding Method. This rate includes the normal cost rate, plus a rate to

amortize the Unfunded Actuarial Accrued Liability (UAAL). We calculate the per-person level dollar contribution rate needed to pre-fund relief benefits using the Aggregate Funding Method.

Actuarially Determined Annual Contributions per Person		
Valuation Year	2020	2022
Pension Rate		
Normal Cost Rate	\$123	\$123
UAAL Rate	0	0
Total Pension Rate	\$123	\$123
Relief Rate		
Normal Cost Rate	\$22	\$66

The following table shows the actual annual contributions, per person, collected by the Board for the Calendar Year (CY) 2023. The VFF member rates are set in statute, but the Board reviews contributions for Reserve Law Enforcement Officers (RLEO) and Emergency Medical Technicians (EMT) every fall. As per the RCW statute on VFF, employers of RLEOs and EMTs pay the full cost of their benefits.

2023 Collected Annual Contributions per Person	
VFF	
Pension Rate	
Member Fee	\$30
Employer Fee	30
Relief Rate	
Employer Fee	\$30
RLEOs and EMTs	
Pension Rate	
Member Fee	\$30
Employer Fee	105
Relief Rate	
Employer Fee	\$235

Please note that these contribution rates are expected to increase when [Engrossed Substitute Senate Bill \(ESSB\) 5829](#) becomes effective. A provision of this bill, which passed during the 2020 Legislative Session, increased the fixed member and employer contribution rates set in statute. See [RCW 41.24.030](#) for additional detail.

ACTUARIAL LIABILITIES

The following table summarizes key measures of actuarial liability. The Present Value of Fully Projected Benefits (PVFB) represents the total expected value of all future benefit payments for all current members, discounted back to the valuation date using the valuation interest rate. In other words, if we invest an amount equal to the PVFB 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 Accrued Liability identifies the portion of the PVFB that has been accrued or “earned” as of the valuation date based on the EAN actuarial cost method.

Actuarial Liabilities		
<i>(Dollars in Millions)</i>	2020	2022
Present Value of Fully Projected Benefits		
Pension Benefits	\$248.6	\$258.9
Relief Benefits	19.3	20.1
Entry Age Normal Accrued Liability		
Pension Benefits	\$243.7	\$254.1
Relief Benefits	9.2	9.1
Valuation Interest Rate	6.00%	6.00%

ESSB 5829 enhanced member benefits, and we first included the costs associated with these enhanced benefits in the [2019 Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund Actuarial Valuation Report](#) (VAVR). At the earliest, the benefit enhancements were scheduled to commence on July 1, 2022, reliant upon a determination letter from the Internal Revenue Service (IRS). However, as of the date of this valuation, these benefit enhancements have not yet been implemented. After consulting with the Board, we now assume these benefit enhancements will commence on July 1, 2024. Please note that this valuation does not capture any potential RLEO impacts or IRS tax implications from the passage of ESSB 5829.

ASSETS

The following table shows the plan's Market Value of Assets (MVA) and Actuarial Value of Assets (AVA), along with actual rates of investment return and other key revenue and disbursement figures. Since actual assets were processed as part of last year's roll-forward valuation, we also display 2021 assets, in addition to 2022 and 2020 assets.

To limit the volatility in contribution rates and funded status due to short-term market fluctuations, the AVA smooths (or defers recognition of) the difference between actual and expected annual investment returns for a certain number of years. The AVA provides a more stable measure of the plan's assets on an ongoing basis than the MVA.

Assets			
<i>(Dollars in Millions)</i>	2020	2021	2022
Assets (Measured at End of Year)			
MVA	\$265.3	\$268.2	\$220.8
MVA Return*	4.3%	3.1%	(15.7%)
AVA	\$262.0	\$271.9	\$271.1
AVA Return	8.2%	5.8%	2.1%
Revenues and Disbursements			
Contributions	\$0.8	\$0.9	\$0.8
Net Fire Insurance Premium Tax	8.2	7.7	6.7
Investment Earnings	11.6	8.1	(40.9)
Disbursements	(\$15.9)	(\$13.7)	(\$14.0)

*This is the dollar-weighted rate of return on the MVA.

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 (AAL) 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 combined funded status for the pension and relief plans. However, based on current funding policy, plan assets are first allocated to pre-fund the pension benefits. As a result, the pension plan's funded ratio is 100 percent whenever total assets exceed the pension AAL.

Pension and Relief Funded Status		
<i>(Dollars in Millions)</i>	2020	2022
a. Entry Age Normal Accrued Liability	\$252.9	\$263.1
b. Actuarial Value of Assets	262.0	271.1
c. Unfunded Liability (a - b)	(9.1)	(8.0)
d. Funded Ratio (b / a)	104%	103%

Note: Totals may not agree due to rounding.

PARTICIPANT DATA

The following table summarizes participant data used in the actuarial valuation for the plan year ending June 30, 2022, along with information from the 2020 valuation.

Changes in Participant Data			
	2020	2022	Percent Change
Actives			
Number of Active Members in Relief Plan	9,651	9,649	(0%)
Number of Active Members in Pension Plan	8,244	7,992	(3%)
Average Age	42.6	42.9	1%
Average Years of Service	10.5	10.6	1%
Percent of Volunteers Covered by Pension Plan	85%	83%	(3%)
Inactives			
Number of Retirees/Beneficiaries	4,669	4,834	4%
Number of Terminated Vested Members	6,148	6,095	(1%)
Number of Survivors (Line-of-Duty)	11	11	0%
Number of Members with Permanent Disabilities	10	6	(40%)

COMMENTS ON 2022 RESULTS

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

PLAN EXPERIENCE

- ❖ The actual investment rate of return on the MVA was 3.1 and (15.7) percent for Fiscal Years (FYs) 2021 and 2022, respectively. We assumed an annual investment rate of return of 6.0 percent. The asset losses are recognized in the AVA over a three-year and eight-year period, respectively, consistent with the asset smoothing method.
- ❖ The FIPT revenue comprised approximately 90 percent of plan contributions, consistent with historical trends. However, the amount of the FIPT allocated to the pension fund in FY 2022 decreased by approximately 20 percent as compared

to FY 2020, due to a greater portion of the FIPT being allocated to the plan's administrative account to implement software and data-related updates.

- ❖ In general, worse than expected economic experience will not impact plan obligations but can increase contribution rates. Due to current Board funding policy, there is no impact to the pension plan contribution rate, but the calculated relief rate will increase.

CHANGES IN ASSUMPTIONS AND METHODS

- ❖ We modeled the plan provision whereby terminated vested members who delay commencement of their retirement benefit are eligible to receive a lump sum for any applicable back payments. This method change increased total plan obligations by approximately 5 percent.
- ❖ After consulting with the Board, we now assume the benefit enhancements provided under ESSB 5829 will commence on July 1, 2024. We previously assumed these enhanced benefits would commence on July 1, 2022. Please see the Actuarial Gain/Loss section of the **Actuarial Exhibits** for further information.

CHANGES TO FUTURE VALUATIONS

The following changes are expected to be incorporated in future actuarial valuations:

Separate RLEO Plan – [House Bill \(HB\) 1336](#), which passed during the 2023 Legislative Session, splits the Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund into two plans – one plan for VFFs and EMTs, and a separate plan for RLEOs. This plan split is scheduled to go into effect in late 2023 and will be addressed in future valuations. In preparation for this plan split, we provide a summary of membership data and actuarial liabilities for the RLEO population in the RLEO Supplemental Information section of the **Appendix**.

Changes to Funding Policy – Our office worked with the actuarial firm Milliman to perform an audit of the funding methodology of the pension and relief plans. Our takeaways were presented to the Board in 2021. We will continue to consult with the Board regarding the plans' funding policy and will reflect any potential changes in future valuations.

Updated Economic Assumptions and Administrative Factors – We will be revisiting the Inflation and Investment Rate of Return assumptions that we use in our modeling, as well as the administrative factors (e.g., early retirement reduction factors) that staff from the Board uses to adjust benefit amounts. Any updates to these items will be reflected in the subsequent valuation.

Section Two:
**Actuarial
Exhibits**





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Actuarial Certification Letter Volunteer Fire Fighters’ and Reserve Officers’ Relief and Pension Fund Actuarial Valuation Report As of June 30, 2022

October 2023

This report documents the results of an actuarial valuation of the Volunteer Fire Fighters’ and Reserve Officers’ Relief and Pension Fund defined under [Chapter 41.24](#) of the Revised Code of Washington (RCW). We prepared this report for the Board for Volunteer Fire Fighters and Reserve Officers (the Board) for the primary purpose of determining contribution requirements for the pension and relief plans based on a June 30, 2022, measurement date, consistent with the Board’s adopted funding policy. 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. We have not performed analysis of the potential range of such future measurements for the purposes of this valuation.

The valuation results summarized in this report involve calculations that require assumptions about future economic and demographic events. In our opinion, all assumptions, methods, and calculations used in the underlying valuation are reasonable and appropriate for the primary purpose stated above and are in conformity with generally accepted actuarial principles and standards of practice as of the date of this publication. 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.

We applied economic and demographic assumptions consistent with our most recent experience studies – the [2021 Pension Experience Study](#), [2018 Relief Experience Study](#), and [2022 VFF Economic Experience Study](#). We relied on medical trend rates from the [2022 Public Employees Benefit Board Other Postemployment Benefits \(PEBB OPEB\) Actuarial Valuation Report](#) to model future medical costs. These trend rates, however, were not intended to model future medical costs for VFF; we chose to apply the Uniform Medical Plan Non-Medicare Costs trend inflation assumption



based on the self-insured nature of the VFF relief plan. The other healthcare-related assumptions were reviewed for reasonableness by a healthcare actuary during the *2018 Relief Experience Study*.

The Board provided us with member, beneficiary, and relief benefit data. We checked the data for reasonableness as appropriate based on the purpose of the valuation. The Washington State Investment Board (WSIB) and the Office of the State Treasurer (OST) provided financial and asset information. An audit of the data and financial information was not performed. We relied on all the information provided as complete and accurate. In our opinion, this information is adequate and substantially complete for purposes of this valuation. The Board and the Office of the State Actuary (OSA) are actively working together to further improve the quality of the data. We use this data for experience studies to set the assumptions upon which the projected costs of the plan are based. In addition, continued improvement in the quality of the participant data will increase the reliability of future valuation results.

The Board adopted the funding policy and asset valuation method for the pension and relief plans, as described in the **Summary of Key Results** section. We believe the asset valuation method is reasonable for its intended purpose of addressing contribution rate volatility when applied in combination with these funding methods and the current asset allocation. Unless noted otherwise, we selected all other assumptions and methods used in this valuation.

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,

Michael T. Harbour, ASA, MAAA
Actuary

Luke Masselink, ASA, EA, MAAA
Senior Actuary

CONTRIBUTION RATES

We used the EAN Funding Method to determine the pension contribution rates as a level dollar amount. This method divides the contribution rate into two parts: a normal cost rate and a rate to amortize the UAAL. We used the Aggregate Funding Method to determine the relief contribution rates as a level dollar amount.

Calculated Annual Contributions per Person*	
Pension Benefits	
Entry Age Normal Cost	\$123
Cost of UAAL	\$0
Total Pension Rate	\$123
Relief Benefits	
Aggregate Normal Cost	\$66
<i>Note: Totals may not agree due to rounding.</i>	
<i>*The actual administrative expenses were approximately \$61 per person for FY 2022.</i>	

The total pension contribution rate, which is the sum of the normal cost and UAAL pension rates, and the relief contribution rate should be sufficient to fund all projected pension and relief benefits of today's members. However, this assumes:

- ❖ Member, employer, and state contributions are collected regularly.
- ❖ Benefit provisions remain the same.
- ❖ Assumptions prove reasonable.

We do not expect a smooth pattern of future relief contribution rates due to the method for allocating assets between the pension and relief plans. This method entails allocating plan assets to pre-fund the pension benefits first, then allocating any assets above the pension plan's accrued liability to the relief plan.

Development of Pension Plan Normal Cost*	
(Dollars in Thousands)	Total
Future Value of Fully Projected Benefits	\$683,056
a. Present Value of fully Projected Benefits	258,878
b. Entry Age Normal Actuarial Accrued Liability	254,055
c. Present Value of Future Normal Costs (PVFNC) (a - b)	4,824
d. Present Value of Future Service (PVFS)**	39,313
e. Per Person Entry Age Normal Cost (c / d in Dollars)	\$123

Note: Totals may not agree due to rounding.

**Please see the Methods section of the Appendix for details on the modified version of the EAN actuarial cost method used.*

***We calculated the Pension PVFS over all active pension members.*

Development of Pension Plan UAAL	
<i>(Dollars in Thousands)</i>	Total
Future Value of Fully Projected Benefits	\$683,056
a. Present Value of Fully Projected Benefits	258,878
b. Actuarial Value of Assets Allocated to Pensions	254,055
c. Unfunded PVFB (a - b)	4,824
d. Present Value of Future Normal Costs	4,824
e. Unfunded Actuarial Accrued Liability (c - d)	\$0
f. Contribution to Amortize the UAAL (Rolling 15-Year)	0
g. Number of Active Members in Pension Plan	7,992
h. Per Person UAAL Contribution (f / g in Dollars)	\$0

Note: Totals may not agree due to rounding.

Development of Relief Plan Normal Cost	
<i>(Dollars in Thousands)</i>	Total
Future Value of Fully Projected Benefits	\$43,717
a. Present Value of Fully Projected Benefits	20,087
b. Actuarial Value of Assets*	17,034
c. Unfunded PVFB (a - b)	3,052
d. Present Value of Future Service**	46,139
e. Per Person Aggregate Normal Cost (c / d in Dollars)	\$66

Note: Totals may not agree due to rounding.

**We use the excess assets above those allocated to the pension plan for purposes of calculating an Aggregate normal cost rate.*

***We calculated the Relief PVFS over all active relief members.*

ACTUARIAL LIABILITIES

The following two tables itemize the liability of the pension and relief plans, respectively, as of the valuation date. Underneath these tables is a 100-year projection of the pension and relief plan benefit payments, on both a future value and present value basis.

Actuarial Liabilities — Pension Plan		
(Dollars in Thousands)	Entry Age Normal Actuarial Accrued Liability	Present Value of Fully Projected Benefits
Active Members		
Retirement	\$47,675	\$50,101
Termination	16,793	18,847
Death Benefits	1,026	1,115
Withdrawal	1,899	2,154
Total Actives	\$67,394	\$72,217
Inactive Members		
Retirees	\$107,421	\$107,421
Terminated Vested*	70,080	70,080
Survivor	9,160	9,160
Total Inactives	\$186,661	\$186,661
All Members		
2022 Total	\$254,055	\$258,878
2020 Total	\$243,660	\$248,623

Note: Totals may not agree due to rounding.

*Roughly 17%, or \$12 million, of this figure is attributable to back payments assumed to be made to retirement eligible members at retirement.

Actuarial Liabilities — Relief Plan		
(Dollars in Thousands)	Entry Age Normal Actuarial Accrued Liability	Present Value of Fully Projected Benefits
Active Members		
Duty Disability	\$172	\$1,334
Duty-Related Death*	(44)	1,454
Medical and Temporary Disability	3,232	11,578
Total Actives	\$3,360	\$14,366
Inactive Members		
Survivor	\$3,845	\$3,845
Disability	1,876	1,876
Total Inactives	5,721	5,721
All Members		
2022 Total	\$9,080	\$20,087
2020 Total	\$9,231	\$19,326

Note: Totals may not agree due to rounding.

*Please see page 26 of our Washington State retirement systems [2021 Actuarial Valuation Report](#) for an explanation of this negative accrued liability.

Pension — Fully Projected Benefit Payments								
<i>(Dollars in Thousands)</i>								
Year	Future Value	Present Value	Year	Future Value	Present Value	Year	Future Value	Present Value
2022*	\$25,622	\$24,887	2056	\$9,619	\$1,288	2090	\$767	\$14
2023	13,883	12,721	2057	9,257	1,170	2091	671	12
2024	16,625	14,371	2058	8,875	1,058	2092	583	10
2025	16,965	13,835	2059	8,504	956	2093	503	8
2026	17,265	13,283	2060	8,167	867	2094	431	6
2027	17,490	12,694	2061	7,814	782	2095	366	5
2028	17,637	12,076	2062	7,494	708	2096	309	4
2029	17,743	11,461	2063	7,167	638	2097	258	3
2030	17,745	10,814	2064	6,847	575	2098	213	2
2031	17,688	10,169	2065	6,545	519	2099	174	2
2032	17,603	9,547	2066	6,237	467	2100	141	1
2033	17,486	8,947	2067	5,936	419	2101	112	1
2034	17,369	8,384	2068	5,615	374	2102	88	1
2035	17,183	7,825	2069	5,281	332	2103	68	1
2036	16,970	7,290	2070	4,950	293	2104	52	0
2037	16,712	6,773	2071	4,627	259	2105	39	0
2038	16,428	6,281	2072	4,315	228	2106	29	0
2039	16,141	5,822	2073	4,016	200	2107	21	0
2040	15,868	5,400	2074	3,730	175	2108	15	0
2041	15,572	4,999	2075	3,456	153	2109	11	0
2042	15,257	4,621	2076	3,195	133	2110	8	0
2043	14,897	4,256	2077	2,947	116	2111	6	0
2044	14,498	3,908	2078	2,711	101	2112	4	0
2045	14,079	3,580	2079	2,487	87	2113	3	0
2046	13,674	3,280	2080	2,275	75	2114	2	0
2047	13,301	3,010	2081	2,075	65	2115	2	0
2048	12,901	2,754	2082	1,887	56	2116	1	0
2049	12,494	2,516	2083	1,710	47	2117	1	0
2050	12,075	2,294	2084	1,544	40	2118	1	0
2051	11,650	2,088	2085	1,389	34	2119	1	0
2052	11,236	1,900	2086	1,245	29	2120	1	0
2053	10,798	1,723	2087	1,111	24	2121	1	0
2054	10,407	1,566	2088	987	20			
2055	10,023	1,423	2089	872	17	Total	\$683,056	\$258,878

Note: Totals may not sum due to rounding.

*We assume eligible terminated vested members retire immediately and receive a lump sum for any applicable back payments.

Relief — Fully Projected Benefit Payments								
<i>(Dollars in Thousands)</i>								
Year	Future Value	Present Value	Year	Future Value	Present Value	Year	Future Value	Present Value
2022	\$2,340	\$2,272	2056	\$418	\$56	2090	\$82	\$2
2023	2,131	1,952	2057	399	50	2091	76	1
2024	1,959	1,693	2058	380	45	2092	70	1
2025	1,812	1,477	2059	362	41	2093	64	1
2026	1,687	1,298	2060	346	37	2094	58	1
2027	1,580	1,147	2061	330	33	2095	53	1
2028	1,487	1,018	2062	316	30	2096	48	1
2029	1,402	906	2063	302	27	2097	43	1
2030	1,328	809	2064	289	24	2098	38	0
2031	1,263	726	2065	277	22	2099	33	0
2032	1,204	653	2066	266	20	2100	29	0
2033	1,151	589	2067	255	18	2101	25	0
2034	1,101	532	2068	244	16	2102	21	0
2035	1,056	481	2069	235	15	2103	18	0
2036	1,015	436	2070	226	13	2104	14	0
2037	977	396	2071	217	12	2105	12	0
2038	939	359	2072	208	11	2106	9	0
2039	903	326	2073	200	10	2107	7	0
2040	868	295	2074	192	9	2108	6	0
2041	834	268	2075	183	8	2109	4	0
2042	800	242	2076	176	7	2110	3	0
2043	767	219	2077	168	7	2111	2	0
2044	735	198	2078	160	6	2112	2	0
2045	703	179	2079	153	5	2113	1	0
2046	672	161	2080	146	5	2114	1	0
2047	641	145	2081	139	4	2115	0	0
2048	612	131	2082	132	4	2116	0	0
2049	584	118	2083	126	3	2117	0	0
2050	558	106	2084	119	3	2118	0	0
2051	532	95	2085	113	3	2119	0	0
2052	507	86	2086	107	2	2120	0	0
2053	484	77	2087	100	2	2121	0	0
2054	461	69	2088	94	2			
2055	439	62	2089	88	2			
						Total	\$43,717	\$20,087

Note: Totals may not sum due to rounding.

ASSETS

The following table summarizes the change in the MVA over the past year. The subsequent table then calculates the AVA based on the adopted asset valuation method, which smooths the inherent volatility in the MVA by deferring a portion of annual investment gains or losses. For more information on this method, please see the Actuarial Methods section of the **Appendix**.

Change in Market Value of Assets	
<i>(Dollars in Thousands)</i>	
Market Value as of June 30, 2021	\$268,209
Revenue	
Member Pension Contributions	\$53
Employer Pension Contributions	362
Relief Plan Contributions	365
Investment Earnings Net of Expenses	(40,929)
Net Fire Insurance Premium Tax (Net FIPT)*	6,724
Total Revenue	(\$33,426)
Disbursements	
Refunds	\$4
Legal Expenses	19
Disability and Survivor Benefits	542
Medical Benefits	1,121
Retirement Pensions (monthly and lump sums)	12,354
Other**	(8)
Total Disbursements	\$14,032
Market Value as of June 30, 2022	\$220,751

Note: Totals may not agree due to rounding.

**Excludes roughly \$3 million allocated to the administrative account by the Board.*

***Due to OFM re-statement of FY 2022 benefit payments.*

Calculation of the Actuarial Value of Assets				
<i>(Dollars in Thousands)</i>				
a. Market Value at 6/30/2022				\$220,751
Deferred Gains and (Losses)				
Plan Year Ending	Original Deferred Gain/Loss	Years Deferred	Years Remaining	Current Deferred Gain/Loss
6/30/2022	(56,691)	8	7	(49,605)
6/30/2021	(7,598)	3	1	(2,533)
6/30/2020	(6,788)	3	0	0
6/30/2019	3,117	2	0	0
6/30/2018	4,322	2	0	0
6/30/2017	12,591	7	1	1,799
6/30/2016	(9,146)	5	0	0
b. Total Deferral				(\$50,338)
c. Market Value less Deferral (a - b)				\$271,089
d. 70% of Market Value of Assets				154,526
e. 130% of Market Value of Assets				286,976
f. Actuarial Value of Assets*				\$271,089
g. Ratio of Actuarial Value to Market Value (f / a)				123%

Note: Totals may not agree due to rounding.

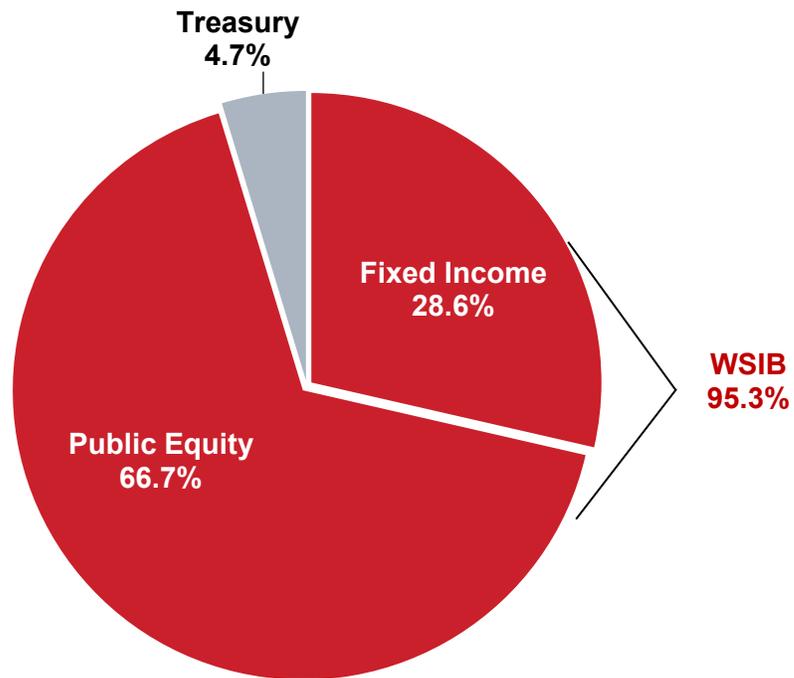
**The AVA may not exceed 130% nor drop below 70% of the AVA.*

The trust fund was established to pay for both pension and relief benefits. The Board chose to allocate the assets to pensions up to the AAL for the pension plan with any remaining assets allocated to relief benefits. The following table summarizes the allocation of the assets to the pension and relief plans.

Allocation of Actuarial Value of Assets by Plan			
<i>(Dollars in Millions)</i>	Pension	Relief	Total
June 30, 2022	\$254.1	\$17.0	\$271.1
June 30, 2021*	N/A	N/A	271.9
June 30, 2020	243.7	\$18.3	262.0
June 30, 2019	226.0	\$22.6	248.7
June 30, 2018	190.7	\$39.6	230.3
June 30, 2017	190.2	\$22.2	212.4
June 30, 2016	190.0	\$10.8	200.8
June 30, 2015	188.5	\$6.0	194.5
June 30, 2014	185.5	\$3.5	189.0
June 30, 2013	182.5	\$0.0	182.5
June 30, 2012	170.3	\$7.4	177.6

**Indicates a roll-forward valuation in which pension and relief asset allocations were not calculated.*

Plan assets are invested by WSIB and OST. The following graph shows the allocation of the assets as of the valuation date. It is our understanding that, going forward, the Board intends to limit the portion allocated to OST to 1 to 2 percent of plan assets. Please see our *2022 VFF Economic Experience Study* for additional context.

Asset Allocation as of June 30, 2022

To help track annual funding, we developed a table that compares the actuarially determined annual costs of the plan to the expected income for the upcoming year. A positive net income means the plan is expected to collect more in non-investment revenue than the benefits that are earned (or accrued) in the given year.

2023 Actuarially Determined Costs vs. Expected Income			
Actuarially Determined Costs*			
		Rate	
	Count	<i>(Dollars in Ones)</i>	Total
Entry Age Normal Cost	7,992	\$123	\$981
UAAL (Surplus)	7,992	0	0
Relief Aggregate Normal Cost	9,649	\$66	\$638
Total Actuarial Costs for Pension and Relief Plans			\$1,619
Expected Income			
State			
Expected Net FIPT**			\$8,200
Pension			
		Rate	
	Count	<i>(Dollars in Ones)</i>	Total
VFFs (Member and Employer)	7,900	\$30 + \$30	\$474
RLEOs and EMTs***	92	135	12
Total Pension			\$486
Relief			
		Rate	
	Count	<i>(Dollars in Ones)</i>	Total
VFFs (Employer)	9,528	\$30	\$286
RLEOs and EMTs***	121	235	28
Total Relief			\$314
Total State, Pension, and Relief Contributions			
Total Income			\$9,001
Net Income (Income Less Actuarial Costs)			\$7,382

Note: Totals displayed in thousands and may not agree due to rounding.

*Assumes \$0 UAAL contribution rate if the plan is currently in a surplus funded position.

**Represents the 2021 Net FIPT grown by roughly 4 percent per year to 2023, which is the ten-year average annual growth in the net FIPT, excluding 2022. We exclude 2022 from this calculation due to the large, one-time allocation to the administrative account made in this year.

***Based on contribution rates adopted by the Board for CY 2023.

FUNDED STATUS

In our actuarial valuation report, we calculate a plan's funded status by comparing the plan's current assets to the AAL of its members. Current assets are determined under an asset valuation method, while the AAL is 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.

Actuaries can select from several acceptable actuarial cost methods when measuring a plan's funded status, based on the purpose of the measurement. The cost methods vary by the manner in which 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 OFM [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.

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.

With this background in mind, we display the funded status of the pension and relief plans on an "actuarial value" basis in the middle columns of the following tables. For the actuarial value basis, we use the assumed investment rate of return (6.0 percent) 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. As an example, in the tables, we also display the funded status using a lower and higher interest rate assumption.

Based on the funding policy adopted by the Board starting with the [2010 VAVR](#), any assets above the pension plan AAL are allocated to fund the relief benefits. As a result, the funded status of the pension plan would remain 100 percent when total assets exceed the pension plan AAL.

Pension Funded Status at Variable Interest Rate Assumptions			
<i>(Dollars in Thousands)</i>	5% ROR	Best Estimate 6% ROR	7% ROR
Entry Age Normal Accrued Liability	\$284,665	\$254,055	\$228,987
AVA	271,089	254,055	228,987
Unfunded Liability	\$13,576	\$0	\$0
Funded Ratio			
June 30, 2022	95%	100%	100%
June 30, 2020*	95%	100%	100%
June 30, 2019**	100%	100%	100%
June 30, 2018	100%	100%	100%
June 30, 2017*	100%	100%	100%
June 30, 2016	97%	100%	100%
June 30, 2015*	94%	100%	100%
June 30, 2014*	93%	100%	100%
June 30, 2013*	91%	99%	100%
June 30, 2012	96%	100%	100%

Note: Prior to June 30, 2020, we used a +/- 0.75% sensitivity around 7.00%. Starting in 2021, we conduct roll-forward valuations in odd-numbered years.

**Actuarial assumptions changed.*

***Benefits increased.*

Relief Funded Status at Variable Interest Rate Assumptions			
<i>(Dollars in Thousands)</i>	Best Estimate		
	5% ROR	6% ROR	7% ROR
Entry Age Normal Accrued Liability	\$9,912	\$9,080	\$8,365
AVA	0	17,034	42,102
Unfunded Liability	\$9,912	(\$7,954)	(\$33,737)
Funded Ratio			
June 30, 2022	0%	188%	503%
June 30, 2020*	0%	198%	517%

Note: Starting in 2021, we conduct roll-forward valuations in odd-numbered years. We did not calculate Entry Age Normal Accrued relief liabilities prior to the 2020 valuation.

**Actuarial assumptions changed.*

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.

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

ACTUARIAL GAIN/LOSS

The following table displays actuarial gains and losses, expressed in terms of EAN AAL. Actuaries use gain/loss analysis to compare actual changes to assumed changes from various sources with respect to assets and liabilities. We also use this analysis to determine:

- ❖ The accuracy of our valuation model.
- ❖ 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 table that follows provides more details on the individual sources of gains and losses for both the pension and relief plans.

Change in Entry Age Normal Liability by Source		
<i>(Dollars in Millions)</i>	Pension	Relief
Actual Liability for 2020 Valuation	\$243.7	\$9.2
Expected Normal Cost	1.6	3.4
Expected Disbursements	(26.1)	(4.3)
Expected Interest	28.6	1.1
Expected Liability for 2022 Valuation	247.8	9.4
Changes in Experience	(5.5)	(0.0)
Termination	0.6	0.2
Retirement	0.0	0.0
Disability	0.0	(0.4)
Mortality	0.7	(0.8)
New Entrants	1.3	0.5
Other Liabilities*	(8.1)	0.5
Other Changes	11.7	(0.3)
Changes to Actuarial Assumptions	0.0	(0.3)
Changes to Actuarial Methods	11.7	0.0
Laws of 2022/2023	0.0	0.0
Actual Liability for 2022 Valuation	\$254.1	\$9.1

**This reduction in the pension liability is comprised of several items, including data corrections. However, a portion of this gain is attributable to the delayed implementation of benefit improvement bill ESSB 5829 from the 2020 Legislative Session, which we initially expected to become effective in 2022.*

Changes from assets and Present Value of Future Service (PVFS) also impact the calculated contribution rates. Additionally, new hires since the prior valuation led to higher-than-expected PVFS (as well as liabilities). In isolation, higher than expected PVFS results in a decrease in contribution rates.

CHANGES IN METHODS AND ASSUMPTIONS SINCE THE 2020 VALUATION

Below is a description of the method and assumption changes that have occurred since the 2020 valuation, along with a table summarizing the impact of these changes on calculated contribution rates. For a summary of the key actuarial assumptions and methods used in the preparation of this valuation, please see the **Appendix**.

- ❖ Based on conversations with staff for the Board, it is our understanding that when a terminated vested member files for retirement after the date they were first eligible to do so, they will receive retroactive payments back to the date of first retirement eligibility, which is often age 65. We added this administrative practice to our modeling beginning with this 2022 valuation. This method change increased total plan obligations by approximately 5 percent.
 - In consultation with the Board, we assume terminated vested members aged 95 or older will not file for retirement. For purposes of the valuation, we assume they have passed away and no further benefits are due.
- ❖ After consulting with the Board, we now assume the benefit enhancements provided under ESSB 5829 will commence on July 1, 2024. We previously assumed these enhanced benefits would commence on July 1, 2022.
- ❖ We updated the medical trend rates applied to active relief plan benefits for consistency with our *2022 PEBB OPEB Actuarial Valuation Report*. We chose to apply the Uniform Medical Plan Non-Medicare Costs trend inflation assumption based on the self-insured nature of the VFF relief plan.

Per Person Annual Contribution Rates				
	2020 Final	Changes to Data & Assets*	Changes to Methods & Assumptions	2022 Final
Pension Rate				
Normal Cost Rate	\$123	\$0	\$0	\$123
UAAL Rate	0	0	0	0
Total Pension Rate	\$123	\$0	\$0	\$123
Relief Rate				
Normal Cost Rate	\$22	(\$208)	\$252	\$66

*This also represents the impact on contribution rates from the delayed implementation of ESSB 5829.

COMMENTARY ON RISK

Actuarial Standards of Practices guide actuaries when performing and communicating their work. ASOP No. 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 our work, we make economic and demographic assumptions such as the level of returns on future investments. In some cases, small changes in these assumptions or unexpected plan experience can lead to significant changes in measurements, like the calculation of the plan's contribution rates or funded status. This can affect plan risk, and these sensitivities can evolve as the plans grow and mature over time. The Board's response to these changes also affects plan risk.

To help assess the risk to the VFF pension and relief plans, we have added analysis to this report to help readers better understand some of these key risks and their potential impacts. We identified Investment, Funding, and Relief Costs as the key risks to the plan.

- ❖ **Investment Risk** – We assume an Investment Rate of Return assumption of 6.00 percent for the plan. The Funded Status at Variable Interest Rate Assumptions tables, found in the **Actuarial Exhibits** section, provide an illustration of the range of impacts under a lower or higher investment rate of return assumption.

If the plan experiences investment returns that are significantly lower than expected, additional funding may be needed beyond an increase in the adopted EMT and RLEO employer contribution rates.

- ❖ **Funding Risk** – The plans are funded through contributions and investment earnings on those contributions. Risks to the plans may emerge if future contributions are changed in a significant way.

Contributions come from members and employers, as well as the Net FIPT. Contributions from the latter comprise approximately 90 percent of the plan's non-investment revenues. Any notable change to this funding source could have a material impact to the funding of the plans. As the plan continues to mature, and the ratio of retirees to actives grows, the plans become more reliant on the Net FIPT.

- ❖ **Risk of Significant Relief Plan Costs** – The relief plan covers medical expenses for active members, so we make assumptions for the total annual amount of medical expenses per person. During the *2018 Relief Experience Study*, we observed a "significant event" (defined as a single medical expense larger than \$500,000) had only occurred once over a 12-year period; however, we acknowledge that these events could occur more frequently. More recently, we observed a significant event that occurred during FY 2020.

If more significant events occur than expected or a single, large scale catastrophic event occurs, then this will have a negative impact on cash flows as well as potentially increasing the number of members receiving relief annuities.

This section provides a high-level discussion of some key risks identified for VFF pension and relief plans, but there are several methods available for assessing risk as discussed in the Ways to Measure Risk section on our Washington State Retirement Systems [Commentary on Risk](#) webpage. This webpage provides additional background and commentary on assessing plan risk. We recommend the Board, with OSA's assistance, continues to monitor these risks and others that may be of interest.



Section Three:
**Participant
Data**



PARTICIPANT DATA

The following tables summarize key plan membership statistics. Starting in 2020, we intend to produce valuations in even-numbered years. As a result, odd-numbered years starting with 2021 will not be captured in the Membership Data going forward since that analysis relied on projected rather than actual data.

Membership Data					
	2017	2018	2019	2020	2022
Actives					
Number of Members in Relief System	11,184	10,785	10,089	9,651	9,649
Average Age	41.2	41.2	41.8	42.2	42.4
Average Total Service	9.7	9.5	9.8	9.8	9.7
Number of Emergency Medical Technicians	62	47	51	45	46
Number of Reserve Law Enforcement Officers	162	140	112	105	75
Number of Rehires Receiving a Pension	93	70	95	106	119
Number of Members in Pension System	9,223	8,960	8,428	8,244	7,992
Percent of Volunteers Covered by Pension System	82%	83%	84%	85%	83%
Average Age	42.1	42.1	42.5	42.6	42.9
Average Total Service	10.8	10.6	10.7	10.5	10.6
Average Pension Benefit Service	9.0	8.9	9.2	9.2	8.8
Number of Emergency Medical Technicians	26	22	25	26	29
Number of Reserve Law Enforcement Officers	137	127	100	95	63
Annuitants					
Number of Retirees/Beneficiaries	4,446	4,494	4,602	4,669	4,834
Average Age	75.0	75.2	75.4	75.6	76.1
Number of New Retirees	216	205	251	235	453*
Average Annual Benefit	\$2,266	\$2,287	\$2,314	\$2,329	\$2,363
Total Annual Benefit Payments (Dollars in Millions)	\$10.1	\$10.3	\$10.7	\$10.9	\$11.4
Terminated Vested					
Number of Terminated Vested Members	6,120	6,181	6,187	6,148	6,095
Average Age	59.9	60.4	60.7	61.0	62.4
Average Total Service	16.0	16.0	15.9	16.0	15.7
Relief Annuities					
Number of Duty-Death Survivors	9	8	9	11	11
Average Age	70.9	70.1	69.9	66.8	68.4
Average Annual Benefit	\$22,260	\$22,736	\$22,736	\$23,113	\$24,623
Number of Duty-Related Disabled	12	11	11	10	6
Average Age	69.0	68.7	69.9	71.3	67.1
Average Annual Benefit	\$24,118	\$23,976	\$23,976	\$24,500	\$26,265

*Reflects number of new retirees since 2020, since data was not processed under the 2021 roll-forward valuation.

Pension Active Members — Age and Membership Service Distribution											
Membership Service	Attained Age										Total
	< 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	
1	343	142	118	87	75	41	41	29	24	22	922
2	265	145	120	84	60	52	31	26	23	25	831
3-4	287	179	177	178	125	91	72	52	44	58	1,263
5-9	130	287	291	272	219	193	142	130	100	117	1,881
10-14	0	57	150	145	160	147	117	87	56	109	1,028
15-19	0	0	25	114	120	116	98	101	77	69	720
20-24	0	0	0	43	72	104	103	93	72	68	555
25 +	0	0	0	0	27	92	123	187	236	127	792
Total	1,025	810	881	923	858	836	727	705	632	595	7,992

Relief Active Members — Age and Membership Service Distribution											
Membership Service	Attained Age										Total
	< 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	
1	653	288	221	181	134	96	78	55	46	63	1,814
2	329	188	152	104	76	66	40	37	29	37	1,059
3-4	340	207	199	193	146	104	85	57	52	75	1,458
5-9	142	305	302	293	226	202	154	136	113	142	2,015
10-14	0	58	154	149	162	147	121	94	60	142	1,087
15-19	0	0	26	116	121	117	100	104	85	79	748
20-24	0	0	0	43	73	104	104	93	72	78	567
25 +	0	0	0	0	27	92	123	188	242	229	901
Total	1,464	1,046	1,054	1,079	965	928	805	764	699	845	9,649

Pension Retirees*		
Age	Number of Retirees	Average Annual Benefit
<65	128	\$9,458
65-69	1,049	12,932
70-74	1,110	12,213
75-79	1,125	11,539
80-84	757	11,121
85-89	442	10,896
90+	223	2,249
Total	4,834	\$2,363

*Includes survivors of retirees.

Line-of-Duty Death Survivors		
Age	Number of Survivors	Average Annual Benefit
<60	2	\$24,623
60-74	5	24,623
75-89	4	24,623
90+	0	0
Total	11	\$24,623

Retirees with Disabilities		
Age	Number of Retirees	Average Annual Benefit
<60	1	\$24,623
60-74	4	27,086
75-89	1	24,623
90+	0	0
Total	6	\$26,265

Section Four:
Appendix



ECONOMIC EXPERIENCE

Economic experience reflects the current economic, financial, and inflationary environment.

- ❖ **Investment Returns** – The Investment Return assumption represents the average annual rate of investment return we expect the assets of the plan to earn over the long-term. For the VFF plan, we use an investment return assumption of 6.0 percent.

However, we recognize that actual annual investment performance over short-term periods will deviate from this long-term assumption. The following table illustrates this by displaying the dollar-weighted annual rate of investment return over the last ten years. The Board-adopted asset smoothing method helps reduce the volatility of these investment returns on calculated plan contribution rates and funded status.

Annual Rate of Return	
Year	Return
2022	(15.65%)
2021	3.07%
2020	4.33%
2019	8.30%
2018	8.93%
2017	13.23%
2016	2.48%
2015	4.42%
2014	18.69%
2013	11.97%

- ❖ **Premium Tax** – The state's contribution to the plan is made through the premium tax paid on fire insurance policies. The level of annual premium tax fluctuates because the amount of the contribution equals the total amount paid by insurers to guarantee associations, which varies from year to year. Each year, 40 percent of this premium tax is contributed to the plan, and this amount has historically been split between the administrative fund and the pension/relief fund. Only the pension/relief fund portion is used to calculate contribution rates.

Premium Taxes Contributed to the Pension/Relief Fund	
Year	Dollars in Thousands
2022	\$6,724
2021	7,667
2020	8,196
2019	7,639
2018	7,227
2017	6,646
2016	7,235
2015	5,903
2014	6,383
2013	5,958
10-Year Annual Growth*	
Average	1.8%

Note: Premium Taxes shown above are net of administrative expenses.

*Based on Geometric Return.

ACTUARIAL ASSUMPTIONS

Demographic Assumptions

Unless noted otherwise, the following assumptions were updated during the *2021 Pension Experience Study*.

- ❖ **Termination Rates** – Termination rates are modeled as a function of Membership Service. We assume that terminated members with vested benefits will defer retirement to age 65.

Probability of Termination	
Service Years	All Ages*
0-4	19%
5-9	15%
10-14	11%
15-19	7%
20-24	7%
25+	9%

*Our modeling assumes active participants, eligible for retirement, will not terminate.

- ❖ **Retirement Rates** – Retirement rates begin at age 60 for active members based on plan provisions.

Probability of Retirement		
Age	Service < 25	Service ≥ 25
60	10%	15%
61	10%	15%
62	10%	15%
63	10%	15%
64	10%	35%
65	20%	50%
66+	15%	35%

- ❖ **Disability Rates** – To value disability benefits under the relief plan, we used the duty disability rates developed for the *2018 Relief Experience Study*. We assume a rate of duty disablement of 0.005 percent for all active members, which equates to approximately 0.5 expected duty-related disabilities per year.
- ❖ **Mortality Rates** – As discussed in the *2021 Pension Experience Study*, the mortality assumptions used for this plan are consistent with assumptions used for Public Employees' Retirement System as shown on our Washington State Retirement Systems Actuarial Assumptions webpage.
 - We assume the VFF duty-related death rate is 1/20,000, or 0.005 percent, which equates to approximately 0.5 expected deaths per year. The Duty-Related Death assumption is constant at all ages and was studied as part of the *2018 Relief Experience Study*.
 - We assume, in consultation with the Board, that terminated vested members aged 95 and older have passed away and no further benefits are due to them.

Economic Assumptions

Unless noted otherwise, the following assumptions were updated during the *2022 VFF Economic Experience Study*.

- ❖ **Valuation Interest Rate** – We assume an annual investment rate of return of 6.0 percent.
- ❖ **Annual Cost-of-Living Adjustment (COLA)** – We assume a 2.25 percent annual COLA for applicable annuity-based benefits since they are fully indexed benefits. COLAs provided for the relief benefits are based on the change in the Consumer Price Index for U.S. Urban Wage Earners and Clerical Workers (CPI-W). COLAs are applied to temporary and permanent disability payments. Additionally, spouses and/or children of permanently disabled relief members and spouses and/or children of VFF relief members killed in the line of duty will receive COLAs on their benefits.

Pension Benefit Assumptions

The following assumptions were updated during the *2021 Pension Experience Study*.

- ❖ **Purchase of Membership Service Credit** – We assume all eligible members will purchase service credit for each year they did not make past pension contributions. As a result, we value all benefits, except for return of contributions, with eligibility and benefit amounts based on membership service instead of benefit service. Consistent with the benefit provisions of ESSB 5829 (Chapter 144, Laws of 2020), service credits above 25 years will be granted prospectively after the effective date of the bill. We do not model any assets associated with these future service credit purchases due to their limited impact on the valuation results.
- ❖ **Ratio of Survivors Selecting Annuities** – Upon the death of an active or terminated vested member, we assume 65 percent of members will have a surviving spouse who elects to receive a pension annuity. This assumption includes both the probability that the member has a spouse, and the probability that the spouse elects to receive an annuity (instead of a return of contributions).
- ❖ **Joint and Survivor Reduction Factor** – We assume a reduction factor of 0.836 will be applied to joint and survivor pension annuities. We base this assumption on the assumed age difference between male and female members and their spouses. We assume male members are three years older and female members are one year younger than their spouses.
- ❖ **Percent Male/Female** – We assume the population is 80 percent male and 20 percent female. We only use this assumption when the gender of a spouse is unknown. Otherwise, we use the gender as reported by the Board.

Relief Benefit Assumptions

Unless noted otherwise, the following assumptions were updated during the *2018 Relief Experience Study*.

- ❖ **Medical Costs** – We assume the following per person costs as of the valuation date and annual inflation as described by the following table.

Medical Benefit Assumptions		
Assumption	Per Person Costs	Assumed Inflation
Medical Claims	\$156.80	Medical Inflation
Member Physicals	\$11.00	0.00%
Temporary Disability	\$11.18	2.25%

- ❖ **Annual Medical Inflation** – To estimate future medical costs, we apply the Uniform Medical Plan Non-Medicare Costs trend from our *2022 PEBB OPEB Actuarial Valuation Report*. The ultimate rate for this annual medical trend is 3.8 percent.
- ❖ **Member Duration on Temporary Disability** – We assume members who receive temporary disability benefits will return to active volunteering within six months. These benefits are included in the total relief costs.

- ❖ **Percent Married** – We assume that 65 percent of the active population is married. We apply this assumption to the duty-related death and disability annuities provided to the spouse of the member.
- ❖ **Duration of Spousal Long-Term Disability Annuity** – We assume a spouse receiving the Long-Term Disability beneficiary annuity will be paid for the member's lifetime. We do not make an assumption for divorce.
- ❖ **Duration of Spousal Duty-Related Death Annuity** – We assume a spouse receiving the duty-related death beneficiary annuity will be paid for the spouse's lifetime. We do not make an assumption for remarriage.
- ❖ **Child-Related Benefits** – To account for the expected costs of child benefits provided by the plan, we increase member duty-related disability benefits by 5 percent and beneficiary duty-related death benefits by 10 percent.

ACTUARIAL METHODS

Asset Valuation Method

An asset valuation method is generally used to adjust the MVA and smooth the effects of short-term investment volatility. The adjusted assets are called the AVA or valuation assets. The asset valuation method adopted by the Board defers a portion of the annual investment gains or losses and is used in combination with the Board's adopted funding method (described below in the **Actuarial Cost Method** section).

Investment gains and losses occur when the annual return on investments varies from the long-term assumed rate. The number of years over which we smooth this gain or loss depends on the magnitude of the gain or loss, but the smoothing period cannot exceed 8 years. We then determine the AVA by adjusting the MVA to reflect any deferred investment gains or losses over each of the last 8 years at the annual recognition rates per year displayed in the following table.

Annual Gain/Loss		
Rate of Return	Smoothing Period	Annual Recognition
13% and up	8 years	12.5%
12-13%	7 years	14.3%
11-12%	6 years	16.7%
10-11%	5 years	20.0%
9-10%	4 years	25.0%
8-9%	3 years	33.3%
7-8%	2 years	50.0%
5-7%	1 year	100.0%
4-5%	2 years	50.0%
3-4%	3 years	33.3%
2-3%	4 years	25.0%
1-2%	5 years	20.0%
0-1%	6 years	16.7%
-1-0%	7 years	14.3%
-2% and lower	8 years	12.5%

Note: The actuarial value of assets may not exceed 130% nor drop below 70% of the MVA.

Additionally, to ensure the AVA maintains a reasonable relationship to the MVA, a 30 percent corridor is in place. This means the AVA may not exceed 130 percent nor drop below 70 percent of the MVA in any valuation.

Actuarial Cost Method

We use the EAN actuarial cost method to determine the present value of earned pensions (or accrued liability). The accrued liability is based on the difference between the pension's PVFB and the pension's Present Value of Future Normal Cost (PVFNC). In other words, the accrued liability is the difference between today's value of all projected pension benefits paid by the plan and today's value of the future normal costs as determined by the pension plan's actuarial funding method. The EAN liabilities are discounted to the valuation date using the valuation interest rate to determine the present value (today's value). The valuation interest rate is consistent with the long-term expected return on invested contributions.

The EAN Funding Method is comprised of two components – a normal cost rate and a rate to amortize the UAAL. We then develop the pension contribution rate as the sum of these two components.

- ❖ The EAN normal cost represents each year's cost as a level annual amount that, if collected from each member's entry age to their projected retirement age, would completely fund their projected pension benefits on an expected basis.
- ❖ The UAAL represents the excess of the PVFB over the sum of the PVFNC and AVA. In other words, the amount of liabilities that are not covered by current assets and future contributions, or in equation form: $UAAL = PVFB - PVFNC - AVA$. Such an excess can arise for numerous reasons. For example:
 - Benefits granted for service prior to establishment of the plan.
 - Retroactive benefit increases or benefit improvements.
 - Changes to actuarial assumptions and methods.
 - Actual experience under the plan that varies from the assumptions.

We developed the UAAL contribution rate in this valuation as a level dollar amount, amortized over a rolling 15-year period. That means we recalculate the UAAL contribution rate each year using a new 15-year period.

We use the Aggregate Funding Method to calculate the relief contribution rates. Compared to the EAN Funding Method, the Aggregate Funding Method does not separately amortize a UAAL. The relief normal cost is the level dollar amount that would fund all projected future relief benefits of today's members. The Aggregate contribution rate is developed by amortizing the relief's Unfunded PVFB over the PVFS of the active relief group, where the Unfunded PVFB represents the excess of the PVFB over the AVA allocated to the relief plan.

Present Value of Future Service

The actuarial cost methods utilize the PVFS for all applicable members to calculate the contribution rates. The expected total years of future service depends on when we assume members will leave active service. Our current termination, retirement, disability, and mortality rates reflect our best estimate of the future behavior of pension and relief members.

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 its 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 also use this model to estimate duty-related medical benefits paid while actively volunteering. While this may not be a typical application based upon the model's primary intent, our independent estimates indicate that the resulting outputs are reasonable for purposes of this valuation.

- ❖ We are not aware of any known weaknesses or limitations of the model that have a material impact on the results.

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 following pension and relief benefits are provided to VFF members:

- ❖ Optional membership in the retirement plan.
- ❖ Duty-related medical benefits.
- ❖ Temporary duty-related disability benefits.
- ❖ Permanent disability benefits for duty-related injuries.
- ❖ Death benefits for duty-related injuries.

These benefits are part of two distinct plans authorized by different sections of statute. The following section summarizes the benefits and contributions established under [Chapter 41.24 RCW](#). This section is for reference only and does not detail the rules and regulations upon which the actuarial calculations are made. **The dollars represent 2022 payment amounts.** The contribution amounts that are fixed in statute are expected to change, contingent upon a decision from the IRS. Please see [RCW 41.24.030](#) for details.

Contributions

❖ Pension.

- If a member chooses to enroll, he/she contributes \$30 annually and the municipality also contributes \$30. Municipalities may pay the entire contribution for the member.
- RLEOs and EMTs are required to pay the full amount adopted annually by the Board. That amount for CY 2022 was \$135.

❖ Relief.

- VFFs do not make contributions to the relief fund. Municipalities contribute \$30 annually on behalf of each member plus 1.5 percent of the annual salary of paid firefighters not covered under the Law Enforcement Officers' and Fire Fighters' Retirement System.
- Employers of RLEOs and EMTs are required to pay the full amount adopted annually by the Board. That amount for CY 2022 was \$235.

❖ Fire Insurance Premium Tax.

- 40 percent of the net premium taxes on fire insurance policies are paid into the plan.

Pension Benefits

NON-DUTY DEATH BENEFITS ([RCW 41.24.180](#))

If the member had less than ten years of service, the spouse will receive a refund of member contributions without interest. If the member had ten or more years of service, the spouse may elect an annuity or a refund of member and employer contributions without interest. The annuity is the member's accrued benefit actuarially adjusted to reflect a 100 percent joint and survivor pension and further actuarially reduced to reflect the difference in the number of years between the member's age at death and age 65.

RETIREMENT PENSIONS (RCW 41.24.170)

The following monthly retirement benefits reflect provisions prior to the passage of ESSB 5829. We will update this section of the report upon approval by the IRS and implementation by the Board.

- ❖ Normal retirement is available at age 65 with at least ten years of membership service. Early retirement eligibility begins at age 60 with ten years of service, with the benefit amount reduced 8 percent per year when retirement occurs prior to age 65. In addition, under normal or early retirement, the pension is reduced for service less than 25 years as shown in the Membership Service Factor for Retirement table.
- ❖ The monthly pension benefit formula is:

$$(\$50 + \$10 \times \text{Benefit Service}) \times \text{Membership Service Factor} \times \text{Age Factor}$$

- ❖ Benefit Service is the number of years the member made pension contributions. Membership Service is the number of years the member served as a volunteer. The maximum monthly pension benefit is \$300. There is no automatic postretirement COLA applied to the benefit.

MEMBERSHIP SERVICE FACTOR FOR RETIREMENT (RCW 41.24.170)

Membership Service Factor				
Membership Service	10-14	15-19	20-24	25 +
Factor	20%	35%	75%	100%

AGE FACTOR FOR RETIREMENT (RCW 41.24.170)

Age Factor						
Age	60	61	62	63	64	65
Factor	60%	68%	76%	84%	92%	100%

RETIREMENT ELECTION OPTIONS (RCW 41.24.172)

The normal payment form of the benefit is a single-life annuity. However, retirees have the option of selecting a 100 percent joint and survivor pop-up pension. If selected, the pension amount is actuarially reduced from the amount of the normal payment form to provide an ongoing survivor benefit. If the member dies first, the reduced pension continues to the spouse for their lifetime. If the spouse dies first, the pension pops up to the amount the member would have received under the single-life payment form.

EMERGENCY MEDICAL SERVICE DISTRICTS (RCW 41.24.330)

Chapter 331, Laws of 1993 extended the membership provisions of the pension and relief plans to include Emergency Medical Service District (EMSD) volunteers. The applicable RCW states the funding for EMTs should be consistent with the most recent actuarial valuation and cover the entire cost of their benefits. Volunteers pay the fixed dollar rate established in statute, while their employers pay the fixed dollar rate plus any excess cost.

RESERVE LAW ENFORCEMENT OFFICERS (RCW 41.24.400)

Chapter 11, Laws of 1995 and Chapter 148, Laws of 1999 extended the membership provisions of the pension and relief plans, respectively, to include RLEOs. These provisions mirror those of the EMSDs.

REFUND OF CONTRIBUTIONS (RCW 41.24.180)

Upon termination from the pension system, the member may elect to receive a refund of their contributions without interest. If the member chooses this option, he/she then forfeits any earned pension benefits.

BUYING BACK PAST SERVICE (RCW 41.24.1701)

If a member misses a pension contribution payment in any year following enrollment in the plan, they may make the contribution at a later date. Interest is added at a rate of one percent per month.

Relief Benefits

The payment amounts listed below are as of the valuation date of this report.

MEDICAL BENEFITS ([RCWS 41.24.035](#), [41.24.155](#), AND [41.24.220](#))

The Board will reimburse all duty-related medical charges, including:

- ❖ Physician fees, paid according to Labor and Industries' fee schedule.
- ❖ Hospital fees (room and care, x-rays, lab work, physical therapy).
- ❖ Physical exams for new entrants (up to \$100 per new member).
- ❖ Mileage for extended treatment not available locally to members.
- ❖ Vocational rehabilitation and prescriptions.

DISABILITY PAYMENTS ([RCW 41.24.150](#))

We rely on the Board for actual relief annuity amounts paid during the year.

- ❖ **Duty Disability** – Members receive temporary duty disability payments of \$4,104 per month for up to six months. If the member is on disability for six consecutive months, then the member is considered to be permanently disabled and they receive \$2,052 per month, their spouse receives \$410. For this valuation, we did not observe any dependent child payments, but we expect the monthly amount, for each dependent child, to be \$177. Disability benefits are subject to a maximum of \$4,104 per month. Spouses are not eligible to receive the beneficiary annuity if they get divorced from the member.
- ❖ **Effective July 1, 2001** – Benefits are increased annually in line with U.S CPI-W.
- ❖ **Non-Duty Disability** – None.

DEATH BENEFITS ([RCWS 41.24.160](#) AND [41.24.230](#))

We rely on the Board for actual relief annuity amounts paid during the year.

- ❖ **Survivors** – Surviving spouses of members who die while on active duty shall be paid \$2,052 monthly. For this valuation, we did not observe any dependent child payments, but we expect an additional monthly amount of \$575 to be paid to each of the member's surviving children while they are under 18 years old.
- ❖ **Effective July 1, 2001** – Benefits are increased annually in line with the same CPI index as noted for the Disability Payments.
- ❖ **Duty Death** – A lump sum of \$214,000 will be paid to a member's survivor if the member was killed in the line of duty.
- ❖ **Funeral and Burial Expenses** – A lump sum of \$2,000 is paid for members who die while on active duty. A \$500 lump sum is paid at the time of death for members who receive disability benefits.

RLEO SUPPLEMENTAL INFORMATION

House Bill 1336, which passed during the 2023 Legislative Session, splits the Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund into two systems – one for VFFs and EMTs, and a separate one for RLEOs. This split is scheduled to go into effect in late 2023 and will be addressed in future valuations. In preparation for this split, the following table provides a summary of membership data and actuarial liabilities for the RLEO population.

RLEO Summary as of June 30, 2022	
Active Membership Data	
Number of Members in Relief System	75
Average Age	48.5
Average Total Service	10.0
Number of Members in Pension System	63
Percent of Volunteers Covered by Pension System	84%
Average Age	48.1
Average Pension Benefit Service	9.2
Inactive Membership Data	
Number of Retirees/Beneficiaries	55
Average Age	72.2
Average Annual Benefit	\$1,989
Number of Terminated Vested Members	95
Average Age	55.6
Average Total Service	15.2
Number of Duty-Death Survivors	0
Number of Duty-Related Disabled	0
Actuarial Liabilities (Dollars in Thousands)	
Pension Plan	
Entry Age Normal Actuarial Accrued Liability	\$2,602
Present Value of Fully Projected Benefits	\$2,649
Relief Plan	
Entry Age Normal Actuarial Accrued Liability	\$30
Present Value of Fully Projected Benefits	\$117



Section Five:
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.

[Prior Actuarial Valuation Reports](#)

Archive of valuations over the past several years.

[2022 VFF Economic Experience Study](#)

Study examining the long-term economic assumptions for the VFF Relief and Pension Fund.

[2021 Pension Experience Study](#)

Report documenting the results of an experience study on the assumptions related to pension benefits for the VFF Relief and Pension Fund.

[2018 Relief Experience Study](#)

Report documenting the results of an experience study on the assumptions related to relief benefits for the VFF Relief and Pension Fund.



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