

2020 ACTUARIAL VALUATION

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



OCTOBER 2021



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



BOARD FOR VOLUNTEER FIRE FIGHTERS AND RESERVE OFFICERS

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Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund Actuarial Valuation Report As of June 30, 2020

October 2021

As required under Revised Code of Washington (RCW) [Chapter 41.24.320](#), this report documents the results of the actuarial valuation which the Office of the State Actuary (OSA) performed on the Volunteer Fire Fighters' and Reserve Officers' (VFF) Relief and Pension Fund of Washington.

Our primary purpose for performing this valuation is to determine the pension and relief contribution requirements for the plan as of June 30, 2020, 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 year. We organized this report into the following four sections:

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

The **Summary of Key Results** provides a high-level summary of the valuation results. The next two sections of the report provide detailed actuarial asset and liability information and membership data. The **Appendices** summarize the actuarial assumptions and methods, major plan provisions, and supporting information used to perform this valuation.

We encourage you to submit any questions concerning this report to our mailing address or our e-mail address at state.actuary@leg.wa.gov. We also invite you to visit our website (leg.wa.gov/osa) for further reference information.

Sincerely,

Michael T. Harbour, ASA, MAAA
Actuary

Kyle Stineman, ASA, MAAA
Actuary

Section One:

Summary of Key Results



INTENDED USE

The purpose for performing the *VFF Relief and Pension Fund Actuarial Valuation Report* is to:

- Develop contribution rates to pre-fund the pension and relief benefits under the funding policy established by the Board.
- Measure the pension system's funding progress.
- Compare actual experience with assumptions used.
- Detect significant demographic changes.
- Highlight key plan, assumption, and method changes since the last valuation.

This report is not intended to satisfy the accounting requirements under the Governmental Accounting Standards Board rules.

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 **Appendices** for additional details on the actuarial funding methods. 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.

CONTRIBUTION RATES

We determine the pension and relief contribution rates by performing an actuarial valuation. Consistent with current Board funding policy, we determine the per-person level dollar contribution rate required 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 determine the per-person level dollar contribution rate required to pre-fund relief benefits using the Aggregate Funding Method.

For reference, the following table displays the annual contributions, per person, collected by the Board for the calendar year 2021. The volunteer fire fighter member rates are set in statute but the Board reviews contributions for Reserve Law Enforcement Officers (RLEO) and Emergency Medical Technicians (EMT) every fall. Employers of RLEOs and EMTs pay the full cost of their benefits.

Required Annual Contributions Per Person		
Valuation Year	2019	2020
Pension Rate		
Normal Cost Rate	\$108	\$123
UAAL Rate	0	0
Total Pension Rate	\$108	\$123
Relief Rate		
Normal Cost Rate	(\$94)	\$22

2021 Collected Annual Contributions Per Person	
Volunteer Fire Fighters	
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 volunteer fire fighter rates are expected to increase when the recent benefit enhancement becomes effective. A provision of [Engrossed Substitute Senate Bill \(ESSB\) 5829](#), 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 table below summarizes key measures of actuarial liability along with the liabilities from last year's valuation. The Present Value of Fully Projected Benefits (PVFB) represents the total expected value of all future benefit payments for all members, discounted back to the valuation date using the valuation interest rate. The EAN Accrued Liability identifies the portion of the PVFB that has been earned as of the valuation date.

Actuarial Liabilities		
<i>(Dollars in Millions)</i>	2019	2020
Present Value of Fully Projected Benefits		
Pension Benefits	\$230.5	\$248.6
Relief Benefits	\$18.1	\$19.3
Entry Age Normal Accrued Liability		
Pension Benefits	\$226.0	\$243.7
Relief Benefits	\$8.5	\$9.2
Valuation Interest Rate	7.00%	6.00%

Beginning with this report, we display the EAN Accrued Liability for the relief plan. Please see the **Actuarial Exhibits** section for additional detail.

ASSETS

Consistent with the Board's adopted funding policy, assets are first allocated to the pension benefits. Any assets above the pension's Actuarial Accrued Liability (AAL) are then allocated to the relief benefits.

To limit the volatility in funded status due to short term market fluctuations, we smooth (or defer recognition of) the difference between actual and expected annual investment returns over a period not to exceed eight years. The Actuarial Value of Assets (AVA) equals the Market Value of Assets (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 the development of the AVA.

Assets		
<i>(Dollars in Millions)</i>	2019	2020
Assets (Measured at End of Year)		
MVA	\$260.6	\$265.3
MVA Return*	8.3%	4.3%
AVA	\$248.7	\$262.0
AVA Return	10.4%	8.2%
Revenues and Disbursements		
Contributions	\$0.9	\$0.8
Net Fire Insurance Premium Tax	7.6	8.2
Investment Earnings	20.6	11.6
Disbursements	(\$13.7)	(\$15.9)

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

FUNDED STATUS

The funded status helps readers evaluate the health of a pension plan. A history of funded status measured consistently over a defined period helps readers evaluate a plan's funding progress over time. The funded status represents the portion of the AAL covered by the AVA. A plan with a 100 percent funded status has one dollar in actuarial assets for each dollar of accrued liability at the valuation date.

Pension Funded Status		
(Dollars in Millions)	2019	2020
a. Entry Age Normal Accrued Liability	\$226.0	\$243.7
b. Actuarial Value of Assets Allocated to Pensions	226.0	243.7
c. Unfunded Liability (a-b)	0.0	0.0
d. Funded Ratio (b/a)	100%	100%

Note: Totals may not agree due to rounding.

Based on the current funding policy, any assets above the pension plan AAL are allocated to fund the relief benefits. As a result, the pension plan would remain 100 percent funded when total assets exceed the pension AAL. Note that we currently do not calculate a relief funded status but are actively reviewing the VFF Funding Methods with the Board.

PARTICIPANT DATA

Changes in the size and composition of plan membership play a major role in the results of the valuation. We observed the following changes in plan membership since last year's valuation.

Changes in Participant Data			
	2019	2020	Percent Change
Actives			
Number of Active Members in Relief Plan	10,089	9,651	(4%)
Number of Active Members in Pension Plan	8,428	8,244	(2%)
Percent of Volunteers Covered by Pension Plan	84%	85%	2%
Average Age	42.5	42.6	0%
Average Years of Service	10.7	10.5	(2%)
Inactives			
Number of Retirees/Beneficiaries	4,602	4,669	1%
Number of Terminated Vested Members	6,187	6,148	(1%)
Number of Survivors (Line of Duty)	9	11	22%
Number of Members with Permanent Disabilities	11	10	(9%)

KEY CHANGES SINCE THE PRIOR VALUATION

Since the [2019 Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund Actuarial Valuation Report](#) (VAVR), the plan realized economic and demographic experience that differed from our long-term assumptions. The actual experience from the most recent data and assets, among other changes, can increase (or decrease) the estimated plan obligations.

Economic Experience – The investment rate of return and the FIPT are key factors that impact the assets of the plan. For Fiscal Year (FY) 2020, we observed a 4.3 percent rate of return on the MVA, compared to the 7.0 percent we assumed.

Meanwhile, the FIPT was consistent with the amount expected, comprising approximately 90 percent of plan contributions.

In general, better-than-expected economic experience will not impact plan obligations but can reduce contribution rates. Due to Board funding policy, there is no impact to the pension plan contribution rate, but the relief rate will decrease. Please see the **Actuarial Exhibits** section for more details on the Board's funding policy.

Demographic Experience – Demographic assumptions are used to estimate when members are expected to stop volunteering (via termination, retirement, or disability) or when retirees are expected to start/stop receiving benefit payments.

Consistent with recent valuations, we observed a higher number of terminations and members delaying retirement than anticipated; this experience reduced plan costs. Overall, the total plan obligations differed by less than 1 percent from what we expected.

Detailed information on demographic experience can be found in the **Actuarial Exhibits** section of this report.

Other Changes – Assumption changes were a source of significant change to the plan obligations. For this report, we reviewed/updated both the economic and demographic assumptions.

We updated our inflation and investment rate of return assumptions for this report. The inflation assumption (which is used to model expected cost-of-living adjustments) was lowered for consistency with our most recent *Report on Financial Condition and Economic Experience Study*. The investment rate of return assumption was updated to reflect a forthcoming change in asset allocation. Both of these economic assumptions decreased since the last report; however, the investment rate of return had a more material impact on plan obligations. Overall, these economic assumption changes increased total plan obligations by approximately 12 percent.

The demographic assumptions were also updated to reflect the *2021 VFF Pension Experience Study*. As part of this study, we analyzed retirement rates, termination rates, and mortality rates, among other demographic assumptions. In general, we moved our assumptions towards historical experience which decreased total plan obligations by approximately 4 percent.

Please see the **Actuarial Certification Letter** for additional comments on the 2020 valuation results.

CHANGES TO FUTURE VALUATIONS

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

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; please see the October 2021 meeting materials from OSA for further details on the potential impact.

Selection of Asset Allocation – The Valuation Interest Rate of 6.00 percent was selected in absence of a final investment policy. As a result, further changes to the assumed investment rate of return may be reflected in our next report. Please see our **Actuarial Certification Letter** below for more details.

Impact of the State's 2021-23 Biennium Budget – As part of a forthcoming actuarial valuation, we will observe a one-time decrease in state contributions to the trust fund. This is the result of additional funds being allocated to certain administrative projects. As we understand, this is a temporary change and believe it will not have a material impact to the funded status.



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, 2020

October 2021

We prepared this report for the Board for Volunteer Fire Fighters and Reserve Officers (the Board). This report documents the results of the actuarial valuation we performed on the Volunteer Fire Fighters’ and Reserve Officers’ Pension and Relief Benefits as defined under [Chapter 41.24](#) of the Revised Code of Washington. The primary purpose for performing this valuation is to determine the contribution requirements for the pension and relief plans as of the valuation date, June 30, 2020, consistent with the Board’s adopted funding policy. This valuation also provides information on the funding progress and developments in the plan over the past year. This valuation report should not be used for other purposes. Please replace this report with a more recent report when available.

To produce the valuation results summarized in this report, we performed calculations requiring assumptions about future economic and demographic events. We applied demographic assumptions consistent with the most recent demographic experience studies ([2021 Pension Experience Study](#) and [2018 Relief Experience Study](#)).

The investment rate of return assumption was updated to reflect a change in asset allocation for the plan. As of the publication of this report, the plan assets have been removed from the commingled trust fund and the new asset allocation is under development. We relied on our professional judgement to select a 6.00 percent discount rate assumption using preliminary analysis provided by the Washington State Investment Board (WSIB) during the July 26, 2021, Volunteer Fire Fighters’ and Reserve Officers’ (VFF) board meeting. We plan to review this assumption next year when the final asset allocation has been selected by WSIB.

Our office does not employ healthcare actuaries, so we relied on the medical trend rates from the [2020 Public Employees Benefit Board Other Postemployment Benefits Actuarial Valuation Report](#) (PEBB OPEB Actuarial Valuation Report) to estimate future medical costs. These trend rates were not intended to model future medical costs of volunteer fire fighters; however, 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 and guidance from Milliman. The other healthcare-related assumptions were reviewed, for reasonableness, by a healthcare actuary during the 2018 Relief Experience Study.

We believe that the assumptions and methods used in the valuation are reasonable and appropriate for the primary purpose stated above. The use of another set of assumptions and methods, however, could also be reasonable and could produce materially different results. Actual results may vary from our expectations.

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Actuarial Certification Letter
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The Board established a fund to provide for both pension and relief benefits. The Board adopted the policy to pre-fund the pension benefits using the Entry Age Normal (EAN) Funding Method. The Board adopted the amortization policy for the Unfunded Actuarial Accrued Liability (UAAL) and the asset valuation method used in this valuation. The Board also adopted the policy to pre-fund the relief benefits using the Aggregate Funding Method. 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.

Under current funding policy, certain plan costs are paid by members, employers, and the state. The 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 fire insurance premium taxes, but excluding investment income), continues to exceed the annual actuarial requirements for the plan. 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 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. WSIB and the Office of the State Treasurer 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 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.

This valuation includes the cost of [Engrossed Substitute Senate Bill \(ESSB\) 5829](#) (Chapter 144, Laws of 2020) that enhanced member benefits. These costs were first included with the 2019 VAVR. At the earliest, the benefit enhancements commence on July 1, 2022, and are reliant upon a determination letter from the Internal Revenue Service (IRS). We reviewed the Actuarial Standards of Practices (ASOPs) as well as discussed with the Board and chose to include this cost in the valuation. We assume these benefit enhancements commence on July 1, 2022.

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 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

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

Required Annual Contributions Per Person*	
Pension Benefits	
Entry Age Normal Cost	\$123
Cost of UAAL	0
Total Pension Rate	\$123
Relief Benefits	
Aggregate Normal Cost	\$22

Note: Totals may not agree due to rounding.

**The administrative expenses were approximately \$45 per person for FY 2020.*

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. See the **Actuarial Methods** section for more detail.

Development of Pension Plan Normal Cost*	
(Dollars in Thousands)	Total
Future Value of Fully Projected Benefits	\$684,138
a. Present Value of Fully Projected Benefits (PVFB)	248,623
b. Entry Age Normal Actuarial Accrued Liability (AAL)	243,660
c. Present Value of Future Normal Costs (PVFNC) (a - b)	4,963
d. Present Value of Future Service (PVFS)**	40,516
e. Per Person Entry Age Normal Cost (c / d in Dollars)	\$123

Note: Totals may not agree due to rounding.

Please see the **Actuarial Methods section of the **Appendices** for details on the modified version of the EAN 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	\$684,138
a. Present Value of Fully Projected Benefits (PVFB)	248,623
b. Actuarial Value of Assets (AVA) Allocated to Pensions	243,660
c. Unfunded PVFB (a - b)	4,963
d. Present Value of Future Normal Costs (PVFNC)	4,963
e. Unfunded Actuarial Accrued Liability (UAAL) (c - d)	\$0
f. Contribution to Amortize the UAAL (Rolling 15-Year)	0
g. Number of Active Members in Pension Plan	8,244
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	\$42,377
a. Present Value of Fully Projected Benefits (PVFB)	19,326
b. Actuarial Value of Assets (AVA)*	18,306
c. Unfunded PVFB (a - b)	1,020
d. Present Value of Future Service (PVFS)**	46,289
e. Per Person Aggregate Normal Cost (c / d in Dollars)	\$22

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

Actuarial Liabilities—Pension Plan		
<i>(Dollars in Thousands)</i>	Entry Age Normal Actuarial Accrued Liability	Present Value of Fully Projected Benefits
Active Members		
Retirement	\$49,239	\$51,698
Termination	17,147	19,269
Death Benefits	1,079	1,172
Withdrawal	1,866	2,156
Total Actives	\$69,331	\$74,295
Inactive Members		
Retirees	\$103,355	\$103,355
Terminated Vested	62,085	62,085
Survivor	8,888	8,888
Total Inactives	\$174,328	\$174,328
All Members		
2020 Total	\$243,660	\$248,623
2019 Total	\$226,038	\$230,540

Note: Totals may not agree due to rounding.

Actuarial Liabilities—Relief Plan		
<i>(Dollars in Thousands)</i>	Entry Age Normal Actuarial Accrued Liability	Present Value of Fully Projected Benefits
Active Members		
Duty Disability	\$162	\$1,251
Duty-Related Death*	(48)	1,431
Medical and Temporary Disability	3,246	10,772
Total Actives	\$3,360	\$13,454
Inactive Members		
Survivor	\$3,504	\$3,504
Disability	2,367	2,367
Total Inactives	\$5,872	\$5,872
All Members		
2020 Total	\$9,231	\$19,326
2019 Total	\$8,498	\$18,069

*Please see page 24 of our Washington State retirement systems [2019 Actuarial Valuation Report](#) for an explanation of this negative accrued liability.

Note: Totals may not agree due to rounding.

Beginning with this report, we display the EAN Accrued Liability for the relief plan. Historically OSA has not calculated a relief accrued liability since relief benefits are paid as they are incurred and don't accrue with additional years of service credit like pensions do. Following an actuarial review of VFF Funding Methods by a third party (Milliman) and internal analysis by our office, we concluded that it would be appropriate to calculate an earned obligation for relief; this would be similar to how OPEB promises are measured.

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
2020	\$12,819	\$12,451	2054	\$9,987	\$1,338	2088	\$779	\$14
2021	13,414	12,291	2055	9,588	1,212	2089	681	12
2022	16,131	13,944	2056	9,177	1,094	2090	591	10
2023	16,590	13,530	2057	8,803	990	2091	510	8
2024	17,006	13,084	2058	8,431	895	2092	438	6
2025	17,264	12,531	2059	8,055	806	2093	372	5
2026	17,507	11,988	2060	7,706	728	2094	314	4
2027	17,713	11,442	2061	7,357	655	2095	262	3
2028	17,828	10,864	2062	7,037	591	2096	217	3
2029	17,900	10,291	2063	6,712	532	2097	178	2
2030	17,895	9,706	2064	6,386	478	2098	144	1
2031	17,814	9,115	2065	6,076	429	2099	115	1
2032	17,695	8,542	2066	5,747	383	2100	91	1
2033	17,553	7,993	2067	5,410	340	2101	70	1
2034	17,411	7,480	2068	5,069	300	2102	54	0
2035	17,204	6,973	2069	4,736	265	2103	41	0
2036	16,958	6,484	2070	4,415	233	2104	30	0
2037	16,665	6,011	2071	4,108	204	2105	22	0
2038	16,350	5,564	2072	3,813	179	2106	16	0
2039	16,038	5,149	2073	3,532	156	2107	12	0
2040	15,750	4,770	2074	3,264	136	2108	8	0
2041	15,423	4,406	2075	3,009	119	2109	6	0
2042	15,077	4,064	2076	2,766	103	2110	4	0
2043	14,688	3,735	2077	2,537	89	2111	3	0
2044	14,259	3,421	2078	2,319	77	2112	3	0
2045	13,820	3,128	2079	2,114	66	2113	2	0
2046	13,392	2,859	2080	1,922	57	2114	2	0
2047	12,996	2,618	2081	1,741	48	2115	1	0
2048	12,569	2,388	2082	1,571	41	2116	1	0
2049	12,150	2,178	2083	1,413	35	2117	1	0
2050	11,704	1,979	2084	1,265	30	2118	1	0
2051	11,271	1,798	2085	1,129	25	2119	1	0
2052	10,837	1,631	2086	1,002	21			
2053	10,389	1,475	2087	886	17			
						Total	\$684,138	\$248,623

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
2020	\$2,226	\$2,162	2054	\$421	\$56	2088	\$77	\$1
2021	2,040	1,869	2055	401	51	2089	71	1
2022	1,874	1,620	2056	382	46	2090	66	1
2023	1,734	1,414	2057	364	41	2091	60	1
2024	1,615	1,242	2058	347	37	2092	55	1
2025	1,515	1,099	2059	331	33	2093	50	1
2026	1,426	976	2060	315	30	2094	45	1
2027	1,347	870	2061	301	27	2095	40	0
2028	1,277	778	2062	287	24	2096	35	0
2029	1,215	698	2063	275	22	2097	31	0
2030	1,159	628	2064	263	20	2098	27	0
2031	1,108	567	2065	251	18	2099	23	0
2032	1,060	512	2066	241	16	2100	20	0
2033	1,017	463	2067	231	14	2101	16	0
2034	977	420	2068	221	13	2102	14	0
2035	940	381	2069	213	12	2103	11	0
2036	905	346	2070	204	11	2104	9	0
2037	872	314	2071	196	10	2105	7	0
2038	839	286	2072	187	9	2106	5	0
2039	808	259	2073	179	8	2107	4	0
2040	777	235	2074	171	7	2108	3	0
2041	747	213	2075	164	6	2109	2	0
2042	717	193	2076	156	6	2110	2	0
2043	688	175	2077	148	5	2111	1	0
2044	660	158	2078	141	5	2112	1	0
2045	632	143	2079	134	4	2113	0	0
2046	605	129	2080	127	4	2114	0	0
2047	580	117	2081	120	3	2115	0	0
2048	555	105	2082	114	3	2116	0	0
2049	531	95	2083	107	3	2117	0	0
2050	508	86	2084	101	2	2118	0	0
2051	485	77	2085	95	2	2119	0	0
2052	463	70	2086	89	2			
2053	442	63	2087	83	2	Total	\$42,377	\$19,326

ASSETS

Change in Market Value of Assets	
<i>(Dollars in Thousands)</i>	
Market Value as of June 30, 2019	\$260,609
Revenue	
Member Pension Contributions	\$40
Employer Pension Contributions	383
Relief Plan Contributions	388
Investment Earnings Net of Expenses	11,623
Net Fire Insurance Premium Tax (Net FIPT)*	8,196
Total Revenue	\$20,630
Disbursements	
Refunds	\$21
Expenses	1
Disability and Survivor Benefits	544
Miscellaneous	0
Medical Benefits	3,353
Retirement Pensions (Monthly and Lump Sums)	11,980
Total Disbursements	\$15,899
Market Value as of June 30, 2020	\$265,340

Note: Totals may not agree due to rounding.

*Excludes \$500K allocated to the administrative account by BVFF.

Actual administrative costs for the prior year were approximately \$439K.

Calculation of the Actuarial Value of Assets				
<i>(Dollars in Thousands)</i>				
a. Market Value at 6/30/2020				\$265,340
Deferred Gains and (Losses)				
Plan Year Ending	Original Deferred Gain/Loss	Years Deferred	Years Remaining	Current Deferred Gain/Loss
6/30/2020	(\$6,788)	3	2	(\$4,526)
6/30/2019	3,117	2	0	0
6/30/2018	4,322	2	0	0
6/30/2017	12,591	7	3	5,396
6/30/2016	(9,146)	5	0	0
6/30/2015	(5,125)	3	0	0
6/30/2014	\$20,028	8	1	2,504
b. Total Deferral				\$3,374
c. Market Value less Deferral (a - b)				\$261,966
d. 70% of Market Value of Assets				185,738
e. 130% of Market Value of Assets				344,942
f. Actuarial Value of Assets*				\$261,966
g. Ratio of Actuarial Value to Market Value (f/a)				99%

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 plans¹.

Allocation of Actuarial Value of Assets by Plan			
<i>(Dollars in Millions)</i>	Pension	Relief	Total
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
June 30, 2011	\$167.8	\$5.8	\$173.6

In previous reports, we displayed a pie chart with the investments allocated by asset class. We did not display this graphic because the final asset allocation is unknown as of the publication of this report. Please see the **Changes to Future Valuations** section for additional detail.

¹The June 30, 2010, VAVR was the first report that allocated a portion of the assets to the relief plan. Prior to that report, all assets were allocated to pensions.

To help track annual funding, we developed a table that compares the actuarial required 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.

2021 Actuarial Required Costs vs. Expected Income			
Actuarial Required Costs*			
	Count	Rate (Dollars in Ones)	Total
Entry Age Normal Cost	8,244	\$123	\$1,010
UAAL (Surplus)	8,244	0	0
Relief Aggregate Normal Cost	9,651	22	213
Total Actuarial Costs for Pension and Relief Plans			\$1,223
Expected Income			
State			
Expected Net FIPT**			\$8,524
Pension			
	Count	Rate (Dollars in Ones)	Total
VFF Member and Employer	8,123	\$30 + \$30	\$487
RLEOs and EMTs	121	135	16
Total Pension			\$504
Relief			
	Count	Rate (Dollars in Ones)	Total
VFF Employer	9,501	\$30	\$285
RLEOs and EMTs	150	235	35
Total Relief			\$320
Total State, Pension, and Relief Contributions			
Total Income			\$9,348
Net Income (Income Less Actuarial Costs)			\$8,126

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

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

***Assumes 4% growth from prior year's net FIPT which is approximately the ten-year average annual growth.*

FUNDED STATUS

We report a plan's funded status by comparing the plan's current assets to today's value of the earned pensions of its members. For this valuation report, we present the funded status on an Actuarial Value Basis (AVB). This measure compares the AVA to the pension plan's EAN accrued liabilities calculated using a long-term interest rate assumption.

The funded status on an AVB assumes the plan is ongoing and therefore uses the same long-term assumptions and methods to develop the assets and liabilities as used in determining the contribution requirements of the plan. We do not 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.

We 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. The AVA provides a more stable measure of the plan's assets on an ongoing basis.

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 required by the pension plan's actuarial funding method. The EAN cost method determines each year's normal 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. 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 funded status serves as an independent measure to assess the pension system's funding progress and is a consistent measure to compare to the funded statuses of other retirement systems. However, differences in assumptions between retirement systems can diminish the value of such comparisons.

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 on Actuarial Value Basis	
<i>(Dollars in Thousands)</i>	
Entry Age Normal Accrued Liability	\$243,660
Actuarial Value of Assets	243,660
Unfunded Liability	\$0
Funded Ratio	
June 30, 2020*	100%
June 30, 2019**	100%
June 30, 2018	100%
June 30, 2017*	100%
June 30, 2016	100%
June 30, 2015*	100%
June 30, 2014*	100%
June 30, 2013*	99%
June 30, 2012	100%
June 30, 2011	100%

*Actuarial assumptions changed.

**Benefits increased.

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 may 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.

The present value of actuarial liabilities is sensitive to the interest rate assumption. The following table shows how the funded status changes when we use different interest rate assumptions. We calculated the liabilities using a 5.00 percent and 7.00 percent investment rate of return assumption to show this sensitivity.

Pension Funded Status at Variable Interest Rate Assumptions			
<i>(Dollars in Thousands)</i>	5%	6%	7%
Entry Age Normal Accrued Liability	\$275,074	\$243,660	\$217,965
Actuarial Value of Assets	261,966	243,660	217,965
Unfunded Liability	\$13,108	\$0	\$0
Funded Ratio			
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%
June 30, 2011	95%	100%	100%

Note: Prior to June 30, 2020, we used a +/- 0.75% sensitivity around 7.00%.

*Actuarial assumptions changed.

**Benefits increased.

ECONOMIC EXPERIENCE

The economic experience will reflect the current economic, financial, and inflationary environment. These factors can change more rapidly than the factors affecting our demographic assumptions.

- **Investment Returns** – Moving forward, we assume future investments return a rate of 6.0 percent per year, net of expenses. 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. Actual annual investment performance over short-term periods will deviate from this long-term assumption. The following table displays the dollar-weighted annual rate of investment return over the last ten years, which shows the short-term volatility of the investment returns.

Annual Rate of Return	
Year	
2020	4.33%
2019	8.30%
2018	8.93%
2017	13.23%
2016	2.48%
2015	4.42%
2014	18.69%
2013	11.97%
2012	1.64%
2011	19.18%
10-Year Average Return*	
Average	9.15%

*Based on Geometric Return.

To reduce volatility on contribution rates and reported funded status, the Board adopted an asset smoothing method that limits short-term fluctuation due to the underlying volatility in the MVA.

- **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 an administrative fund and a pension fund. Only the pension fund portion is used to calculate contribution rates.

Premium Taxes Contributed to Plan	
Year	<i>(Dollars in Thousands)</i>
2020	\$8,196
2019	7,639
2018	7,227
2017	6,646
2016	7,235
2015	5,903
2014	6,383
2013	5,958
2012	5,602
2011	5,815
2010	\$5,685
10-Year Annual Growth*	
Average	3.7%

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

**Based on Geometric Return.*

DEMOGRAPHIC EXPERIENCE

The following table displays the various ways members enter and exit the VFF system. For each, we compare the actual counts to our expected counts over the 2020 valuation period, and calculate the ratio of the two in the “Act/Exp” column. Due to the relatively small population of the VFF system, we do expect to see some variation in these ratios on an annual basis. However, over the long term, we anticipate that our expected counts for each will model the actual counts closely, with the exception of new entrants since our valuations do not assume new members join the system. To help ensure our expected counts for each mode of exit are reasonable, we re-evaluate how we calculate these as part of our demographic experience studies.

Actual vs. Expected Demographic Counts (Pension Plan)			
Counts by Decrement Type	Actual	Expected	Act/Exp
Members Who Join the Plan			
New Volunteers	1,147	N/A	N/A
Return to Work	310	N/A	N/A
Members Who Leave the Plan			
Termination*	1,324	1,010	1.31
Retirement	67	238	0.28
Member Deaths			
Actives	7	21	0.34
Retiree	188	153	1.23
Survivor	16	16	1.03
Terminated Vested	19	131	0.14

**Approximately 92 terminations were members who were retirement eligible.*

ACTUARIAL GAIN/LOSS

Since the 2019 VAVR, key actuarial gains and losses impacted the results of this valuation as displayed in the following table. Lower than expected liabilities will reduce contribution rates and higher than expected liabilities will increase contribution rates.

Change in Liability by Source		
<i>(Dollars in Millions)</i>	Pension	Relief
Actual Liability for 2019 Valuation	\$230.5	\$18.1
Expected Disbursements	(12.6)	(2.2)
Interest	15.7	1.2
Expected Liability for 2020 Valuation	233.7	17.1
Changes in Experience	(2.3)	1.4
Other Changes	17.3	0.8
Actual Liability for 2019 Valuation	\$248.6	\$19.3

Difference Between Actual and Expected Liability		
Liability (Gain)/Loss	Pension	Relief
Changes in Experience		
Termination	(\$1.3)	(\$1.1)
Retirement	(0.1)	0.0
Disability	0.0	(0.2)
Mortality	(1.3)	0.5
New Entrants	1.5	2.2
Other Liabilities*	(1.1)	(0.0)
Total	(\$2.3)	\$1.4
Other Changes		
Changes to Actuarial Assumptions	\$17.3	\$0.8
Pension Experience Study (Retirement)	(1.9)	0.2
Pension Experience Study (Termination)	(2.1)	(1.0)
Pension Experience Study (Mortality)	(6.1)	0.2
New Discount Rate	27.2	1.6
Other**	0.1	(0.2)
Changes to Actuarial Methods	0.0	0.0
Laws of 2021	0.0	0.0
Total	\$17.3	\$0.8

*This gain for Pensions is comprised of several items, primarily data corrections and a limitation with our valuation software that will be resolved once the benefit improvements from the 2019 Legislative Session become effective.

**Includes the Miscellaneous assumptions from our Pension Experience Study, updated Medical Trend, and new Inflation assumption; note that the first only impacts pension, while the latter two only impact relief.

Changes from assets and Present Value of Future Service (PVFS) will also impact the calculated contribution rates.

For FY 2020, we observed a 4.3 percent rate of return on the MVA, compared to the 7.0 percent we assumed. In general, actual investment returns that are lower or higher than expected result in higher or lower contribution rates, respectively. However, the actual change in contribution rates is dependent upon the impact to the AVA since the plan is funded based on the AVA. The AVA is different from MVA because it recognizes past asset gains/losses over up to 8 years. The plan is currently deferring approximately \$3.4 million in assets, which will be recognized in future valuations. Another source of asset change was the FIPT, which was consistent with the amount expected and comprised of approximately 90 percent of plan contributions.

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.

EFFECT OF PLAN, METHOD, ASSUMPTION, AND CORRECTION CHANGES

Plan Changes

- None.

Method Changes

- None.

Assumption Changes

- **Pension Demographic Assumptions** – These assumptions were updated based upon our [2021 Pension Experience Study](#). Please see this study for a summary of assumption changes as well as additional information.
- **Economic Assumptions:**
 - **Investment Rate of Return Assumption** – We lowered our investment rate of return assumption from 7.00 percent to 6.00 percent. Please see our **Actuarial Certification Letter** for more details.
 - **Inflation Assumption** – We lowered this assumption from 2.50 percent to 2.25 percent based on analysis from our *2021 Report on Financial Condition and Economic Experience Study*, the duration of VFF plan liabilities, as well as our professional judgment.
- **Medical Trend Rates** – These rates were updated for consistency with our *2020 PEBB OPEB Actuarial Valuation Report*.

Corrections

- None.

Per Person Annual Contribution Rates				
Valuation Year	2019 Final	Changes to Data & Assets*	Changes to Laws, Assumptions & Methods**	2020 Final
Pension Rate				
Normal Cost Rate	\$108	\$1	\$14	\$123
UAAL Rate	0	0	\$0	0
Total Pension Rate	\$108	\$1	\$14	\$123
Relief Rate				
Normal Cost Rate	(\$94)	(\$263)	\$379	\$22

*This represents the impact on contribution rates resulting from updated asset values and demographics of the VFF population from the previous valuation date.

**This represents the impact on contribution rates attributable to corrections and plan, assumption, and method changes.

Section Three:
**Participant
Data**



PARTICIPANT DATA

Membership Data					
Actives	2016	2017	2018	2019	2020
Number of Members in Relief System	11,532	11,184	10,785	10,089	9,651
Average Age	40.8	41.2	41.2	41.8	42.2
Average Total Service	9.6	9.7	9.5	9.8	9.8
Number of Emergency Medical Technicians	65	62	47	51	45
Number of Reserve Law Enforcement Officer	190	162	140	112	105
Number of Rehires Receiving a Pension	76	93	70	95	106
Number of Members in Pension System	9,434	9,223	8,960	8,428	8,244
Percent of Volunteers Covered	82%	82%	83%	84%	85%
Average Age	41.9	42.1	42.1	42.5	42.6
Average Total Service	10.8	10.8	10.6	10.7	10.5
Average Pension Benefit Service	9.0	9.0	8.9	9.2	9.2
Number of Emergency Medical Technicians	30	26	22	25	26
Number of Reserve Law Enforcement Officer	158	137	127	100	95
Retirees					
Number of Retirees/Beneficiaries	4,367	4,446	4,494	4,602	4,669
Average Age	74.9	75.0	75.2	75.4	75.6
Number of New Retirees	202	216	205	251	235
Average Annual Benefit	\$2,245	\$2,266	\$2,287	\$2,314	\$2,329
Total Annual Benefit Payments (Dollars in Millions)	\$9.8	\$10.1	\$10.3	\$10.7	\$10.9
Terminated Vested					
Number of Terminated Vested	6,263	6,120	6,181	6,187	6,148
Relief Annuities					
Number of Duty-Death Survivors	11	9	8	9	11
Average Age	67.7	70.9	70.1	69.9	66.8
Average Annual Benefit	\$22,045	\$22,260	\$22,736	\$22,736	\$23,113
Number of Duty-Related Disabled	12	12	11	11	10
Average Age	68.0	69.0	68.7	69.9	71.3
Average Annual Benefit	\$24,252	\$24,118	\$23,976	\$23,976	\$24,500

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+	
1	398	167	169	112	75	37	44	20	56	1,078
2	270	143	104	112	70	45	35	25	49	853
3-4	302	194	199	173	114	102	66	63	111	1,324
5-9	134	272	264	270	223	165	133	103	202	1,766
10-14		59	154	145	171	136	139	91	163	1,058
15-19			46	127	123	119	91	117	145	768
20-24				29	102	93	108	106	153	591
25 +					27	74	141	188	376	806
Total	1,104	835	936	968	905	771	757	713	1,255	8,244

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+	
1	667	283	285	163	118	73	62	36	113	1,800
2	326	168	136	126	86	54	44	33	69	1,042
3-4	335	224	223	191	124	115	75	77	120	1,484
5-9	144	288	272	285	230	170	142	115	248	1,894
10-14		61	162	147	173	138	141	96	207	1,125
15-19			48	128	125	121	93	120	156	791
20-24				29	102	93	108	106	162	600
25 +					27	74	141	189	484	915
Total	1,472	1,024	1,126	1,069	985	838	806	772	1,559	9,651

Pension Retirees*					
Age	Number of Retirees	Average Annual Benefit	Age	Number of Retirees	Average Annual Benefit
60	31	\$1,441	76	208	\$2,386
61	15	1,816	77	234	2,247
62	17	2,247	78	190	2,409
63	44	1,932	79	160	2,234
64	44	2,263	80	153	2,256
65	189	2,445	81	156	2,300
66	241	2,620	82	159	2,036
67	201	2,538	83	151	2,089
68	213	2,539	84	110	2,149
69	203	2,495	85	100	2,183
70	207	2,382	86	87	2,288
71	241	2,380	87	86	2,220
72	233	2,418	88	48	2,349
73	280	2,232	89	66	2,239
74	213	2,352	90+	178	2,238
75	211	\$2,309	Total	4,669	\$2,329

*Includes beneficiaries of service retirees.

Line-of-Duty Death Survivors		
Age	Number of Survivors	Average Annual Benefit
<60	3	\$23,113
60-74	4	23,113
75-89	4	23,113
90+	0	0
Total	11	\$23,113

Retirees with Disabilities		
Age	Number of Retirees	Average Annual Benefit
<60	1	\$23,113
60-74	5	24,962
75-89	4	24,269
90+	0	0
Total	10	\$24,500



Section Four:
Appendices



ACTUARIAL ASSUMPTIONS

Decrement Rates

Unless noted otherwise, the following assumptions were developed in the *2021 Pension Experience Study*.

- **Termination Rates** – Termination rates are modeled as a function of Membership Service.

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.

We assume that terminated members with vested benefits will defer retirement to age 65.

- **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%

- **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.
- **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.

Pension Benefit Assumptions

The following assumptions were most recently reviewed/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.

- **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 developed in the *2018 Relief Experience Study*.

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

Medical Benefit Assumptions		
Assumption	Per Person Costs	Assumed Inflation
Medical Claims	\$140.48	Medical Inflation
Member Physicals	\$11.00	0.00%
Temporary Disability	\$10.69	2.25%

- **Annual Medical Inflation** – To estimate future medical costs, we apply the Uniform Medical Plan Non-Medicare Costs trend from our *2020 PEBB OPEB Actuarial Valuation Report* as shown in the table below.

Medical Inflation	
Fiscal Year	Rate
2021	7.4%
2022	5.3%
2023	5.3%
2024	5.1%
2025	5.1%
2026	5.1%
2027	5.1%
2028	5.1%
2029	5.1%
2030	5.1%
2040	5.2%
2050	5.3%
2060	5.1%
2070	4.6%
2080+	4.3%

Note: For display purposes, tables were summarized. Please see our [website](#) for the full table.

- **Duty-Related Death Rate** – We assume the VFF duty-related death rate is $1/20,000 = 0.005\%$, which equates to approximately 0.5 expected deaths per year. The duty-related death assumption is constant at all ages.
- **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.

Miscellaneous Assumptions

- **Valuation Interest Rate** – We assume an annual investment rate of return of 6.0 percent. Please see our Actuarial Certification Letter for additional details.
- **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 (CPI) for U.S. Urban Wage Earners and Clerical Workers. COLAs are applied to temporary and permanent disability payments. Additionally, spouses and/or children of permanently disabled VFF relief members and spouses and/or children of VFF relief members killed in the line of duty will receive COLAs on their benefits.

ACTUARIAL METHODS

Asset Valuation Method

An asset valuation method is generally used to adjust the MVA and smooth the effects of short-term volatility. The adjusted assets are called the AVA or valuation assets. The asset valuation method adopted by the Board provides up to eight years of smoothing for asset returns and is used in combination with the funding method (Actuarial Cost Method) described below.

We determine the AVA by adjusting the MVA to reflect the difference between the actual investment return and the expected investment return during each of the last eight years at the annual recognition rates per year displayed in the following table. Note that the asset valuation method will smooth assets based on the new expected investment rate of return (6.00 percent) beginning with the 2021 VAVR.

Annual Gain/Loss		
Rate of Return	Smoothing Period	Annual Recognition
14% and up	8 years	12.50%
13-14%	7 years	14.29%
12-13%	6 years	16.67%
11-12%	5 years	20.00%
10-11%	4 years	25.00%
9-10%	3 years	33.33%
8-9%	2 years	50.00%
6-8%	1 year	100.00%
5-6%	2 years	50.00%
4-5%	3 years	33.33%
3-4%	4 years	25.00%
2-3%	5 years	20.00%
1-2%	6 years	16.67%
0-1%	7 years	14.29%
0% and lower	8 years	12.50%

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

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

The EAN Actuarial Cost Method is comprised of two components:

- Normal cost.
- UAAL.

We develop the pension contribution rate as the sum of the normal cost and an amount to amortize the UAAL.

We use the EAN actuarial cost method to develop the pension contribution rates. The Pension normal cost is the level dollar amount, calculated individually, that would fund each member's pension benefits from their date of entry in the plan to their assumed retirement.

The UAAL represents the excess of the PVFB over the PVFNC and the AVA. In other words, the amount of liabilities that are not covered by the sum of current assets and future contributions.

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 relief plan's normal cost contribution rate is developed by amortizing the relief's Unfunded PVFB over the PVFS of the active relief group. 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

We relied on the ProVal® software developed by Winklevoss Technologies to perform this valuation. To assess the general operation of this 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. The use of the model for this analysis is appropriate given its intended purpose.

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 2020 payment amounts.** The contribution amounts that are fixed in statute are expected to change, contingent upon a decision from the IRS. Please see Chapter 41.24.030 RCW for details.

Participation

[RCW 41.24.010 \(8\)](#)

- "Participant" means: (a) For purposes of relief, any reserve officer who is or may become eligible for relief under this chapter or any fire fighter or emergency worker; and (b) for purposes of retirement pension, any fire fighter, emergency worker, or reserve officer who is or may become eligible to receive a benefit of any type under the retirement provisions of this chapter, or whose beneficiary may be eligible to receive any such benefit.

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 the 2021 calendar year was \$135.
- **Relief.**
 - VFF members 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 fire fighters not covered under LEOFF.
 - Employers of RLEOs and EMTs are required to pay the full amount adopted annually by the Board. That amount for the 2021 calendar year was \$235.
- **Fire Insurance Premium Tax** – 40 percent of the net premium taxes on fire insurance policies are paid into the plan.

Pension Benefits

DEATH BENEFITS

[RCW 41.24.180](#)

Non-Duty Death – 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 fire fighter’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 was a member of the relief plan. The maximum monthly pension benefit is \$300. There is no automatic postretirement COLA applied to the benefit.

MEMBERSHIP SERVICE FACTOR FOR RETIREMENT

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

AGE FACTOR FOR RETIREMENT

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

ACTUARIALLY EQUIVALENT EARLY RETIREMENT REDUCTION FACTORS

We apply these factors to calculate the annuity benefit paid to survivors of active members who die from a non-duty related cause.

Actuarially Equivalent ERFs			
Member's Age	Factor	Member's Age	Factor
<35	10.0%	50	28.9%
35	10.0%	51	31.2%
36	10.6%	52	33.7%
37	11.4%	53	36.4%
38	12.2%	54	39.3%
39	13.1%	55	42.5%
40	14.0%	56	46.0%
41	15.1%	57	49.9%
42	16.2%	58	54.2%
43	17.4%	59	58.8%
44	18.7%	60	64.0%
45	20.0%	61	69.8%
46	21.5%	62	76.1%
47	23.2%	63	83.2%
48	24.9%	64	91.1%
49	26.9%	65	100.0%

Note: These factors are rounded for display purposes.

RETIREMENT OPTIONS

[RCW 41.24.172](#)

- The normal payment form of the benefit is a single-life annuity.
- Retirees have the option of selecting a 100 percent joint and survivor pop-up pension. The pension amount is 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

- 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 of the EMSD volunteers should be consistent with the most recent actuarial valuation.
- The funding of the system includes contributions from the members and their districts at a rate established in statute. The total of these is less than the normal cost. The balance of the normal cost comes from another revenue source:

40 percent of the state's premium tax on fire insurance policies. Since the premium tax is independent of the number of members, the addition of new members lowers the system's funding. To prevent this, the entire normal cost and administration expenses are paid by the EMSDs and their volunteers. Volunteers pay the fixed dollar rate established in statute. The EMSDs pay the fixed dollar rate plus any excess cost.

RESERVE LAW ENFORCEMENT OFFICERS

- Chapter 11, Laws of 1995 extended the membership provisions of the pension plan to include RLEOs. The pension provisions mirror those of the EMSDs.
- Chapter 148, Laws of 1999 extended the membership provisions of the relief plan to include RLEOs. The relief provisions mirror those of the EMSDs.

REFUND OF CONTRIBUTIONS

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

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 1 percent per month.

Relief Benefits

MEDICAL BENEFITS

[RCW 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, laboratory work, physical therapy).
- Screening physical exams for new entrants (up to \$100 per new member).
- Mileage for extended treatment not available locally to VFF members.
- Vocational rehabilitation and prescriptions.

DISABILITY PAYMENTS²

[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 \$3,852.16 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 \$1,926.08 per month, their spouse receives \$385.23. For this valuation, we did not observe any dependent child payments, but we expect the monthly amount, for each dependent child, to be \$166.15. Disability benefits are subject to a maximum of \$3,852.16 per month. Spouses are not eligible to receive the beneficiary annuity if they get divorced from the VFF member.
- **Effective July 1, 2001** – Benefits are increased annually in line with the CPI Urban Wage Earners and Clerical Workers (CPI-W – All Cities).

²Disability payments display the amount of payments as of the valuation date of this report.

- **Non-Duty Disability** – None.

DEATH BENEFITS³

[RCW 41.24.160](#), [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 \$1,926.08 monthly. For this valuation, we did not observe any dependent child payments, but an additional monthly amount of \$539.35 is 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 U.S. CPI-W – All Cities.
- **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.

COMMENTARY ON RISK

Actuarial Standards of Practice 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 the course of developing our actuarial valuation 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** – As a result of an upcoming new asset allocation, we lowered the investment rate of return assumption to 6.00 percent. A lower assumption than last year does not necessarily imply that the plan is taking on less investment risk. If the plan experiences significantly lower (or higher) actual investment returns than expected, required contributions may materially change.

The Pension Funded Status at Variable Interest Rate Assumptions table, found in the **Actuarial Exhibits** section, provides an illustration for the range of impacts under a lower or higher investment rate of return assumption.

- **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 noninvestment revenues. As shown in the Premium Taxes Contributed to Plan table, found in the **Actuarial Exhibits** section, the Net FIPT has been steadily increasing. However, any notable change to this funding source could have material impact to the funding of the plans. As the plans 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 VFF 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 twelve-year period; however, we acknowledge that these events could occur more frequently. More recently, we observed a "significant event" that occurred during FY 2020.

³Death payments display the amount of payments as of the valuation date of this report.

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, 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.

THE OFFICE OF THE STATE ACTUARY'S WEBSITE

Our website (leg.wa.gov/osa) contains additional information and educational material not included in this report. The site also contains an archive of 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.

2021 Report on Financial Condition and Economic Experience Study

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

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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