



# 2016 Actuarial Valuation

**OCTOBER 2017**





## 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  
Web: [bvff.wa.gov](http://bvff.wa.gov)



Report prepared by the Office of the State Actuary

## Office of the State Actuary

*“Supporting financial security for generations.”*

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

Sarah Baker

Kelly Burkhart

Mitch DeCamp

Graham Dyer

Aaron Gutierrez, MPA, JD

Beth Halverson

Michael Harbour, ASA, MAAA

Lisa Hawbaker

2100 Evergreen Park Dr., SW Suite 150  
PO Box 40914  
Olympia, WA 98504-0914

[leg.wa.gov/osa](http://leg.wa.gov/osa)

Luke Masselink, ASA, EA, MAAA

Corban Nemeth

Darren Painter

Stephanie Roman, MA, JD

Frank Serra

Christi Steele

Kyle Stineman, ASA

Keri Wallis

Lisa Won, ASA, FCA, MAAA

Phone: 360.786.6140

TDD: 711

Fax: 360.586.8135

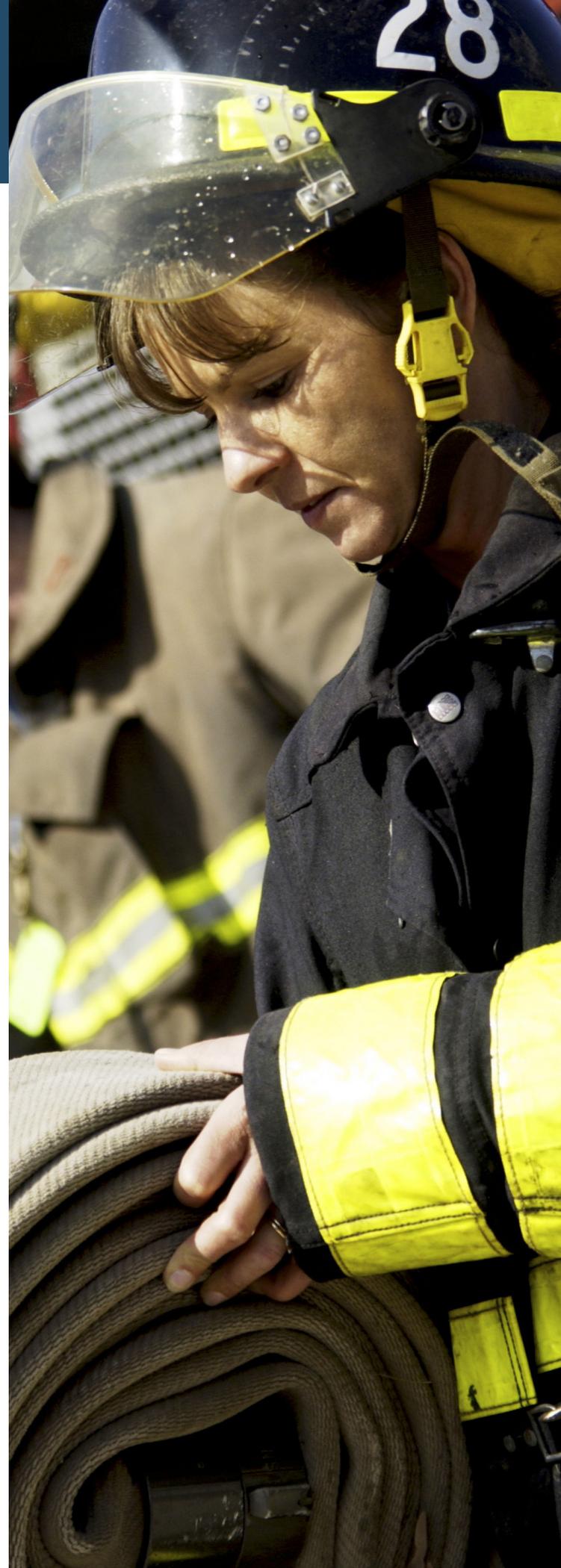
[state.actuary@leg.wa.gov](mailto:state.actuary@leg.wa.gov)

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# Office of the State Actuary

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## Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund Actuarial Valuation Report As of June 30, 2016

October 2017

As required under [RCW 41.24.320](#), this report documents the results of the actuarial valuation which the Office of the State Actuary (we) performed on the Volunteer Fire Fighters' and Reserve Officers' 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, 2016, under the funding policy established by the Board for Volunteer Fire Fighters and Reserve Officers. 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 regular address or our e-mail address at [state.actuary@leg.wa.gov](mailto:state.actuary@leg.wa.gov). We also invite you to [visit our website](#) for further information regarding the actuarial funding of the Washington State retirement systems.

Sincerely,

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

Michael Harbour, ASA, MAAA  
Senior Actuarial Analyst



SECTION ONE:

# Summary of Key Results





## Intended Use

The purpose for performing the Volunteer Fire Fighters' and Reserve Officers' (VFF) Relief and Pension Fund Actuarial Valuation is to:

- Develop contribution rates to pre-fund the pension and relief benefits under the funding policy established by the Board for Volunteer Fire Fighters and Reserve Officers (the Board).
- Measure the pension system's funding progress.
- Compare actual experience with assumptions used.
- Detect significant demographic changes.
- Highlight significant plan, assumption, and method changes.

We do not intend this report to satisfy the accounting requirements under the Governmental Accounting Standards Board rules.

## Funding Policy

The Board relies on systematic actuarial funding to finance the on-going 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. This is a cost-sharing plan that relies on contributions from employees and employers, while the state contributes 40 percent of the annual Fire Insurance Premium Tax 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 (NC) 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.

## SUMMARY OF KEY RESULTS

Per Person Annual Contributions		
Valuation Year	2015	2016
<b>Pension Rate</b>		
Employee	\$30	\$30
Employer	30	30
State	39	40
Normal Cost Rate	\$99	\$100
State UAAL Rate	0	0
Total Pension Rate	\$99	\$100
<b>Relief Rate</b>		
Employer	\$30	\$30
State	282	203
Total Relief Rate	\$312	\$233
<b>Operating Expenses</b>		
Administration and Expenses	\$32	\$33

Members of the pension plan and their employers are charged a set pension rate. Only employers of members are charged a set rate for relief costs. Emergency medical service districts and reserve law enforcement officers' employers pay the full cost of their benefits. Under current funding policy, the state covers all remaining plan costs through the collection of taxes on fire insurance premiums.

The operating expense rate is not actually collected, and is provided here for informational purposes only. We determined this rate based on actual annual costs from the prior year.

## Actuarial Liabilities

Actuarial Liabilities		
<i>(Dollars in Millions)</i>	2015	2016
<b>Present Value of Future Benefits</b>		
Pension Benefits	\$192.6	\$193.9
Relief Benefits	\$23.9	\$23.8
<b>Pension Plan*</b>		
Entry Age Normal Accrued Liability	\$188.5	\$190.0
Unfunded Actuarial Accrued Liability	\$0.0	\$0.0
Valuation Interest Rate	7.00%	7.00%

*\*We do not calculate an actuarial accrued liability for the relief plan since the relief benefits are paid as they are incurred. Relief benefits are not earned or accrued as a member's service increases.*

## 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 allocated to the relief benefits.

Assets		
(Dollars in Millions)	2015	2016
Market Value of Assets	\$207.9	\$208.7
Actuarial Value of Assets	194.5	200.8
Contributions*	1.0	1.0
Disbursements	12.1	12.5
Investment Return	8.8	5.1
Other**	5.9	7.2
Rate of Return on Assets***	4.4%	2.5%

\*Includes Employee, Employer, and Relief contributions.

\*\*Includes the Fire Insurance Premium Tax less Administrative Expenses.

\*\*\*This is the dollar-weighted rate of return on the Market Value of Assets.

## Funded Status

The funded status of the pension plan compares the plan's assets to the earned pension liabilities of its members. We determined this by comparing the Actuarial Value of Assets (AVA) to the EAN accrued pension liabilities calculated using the long-term interest rate assumption.

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. We do not calculate an AAL for the relief plan since the relief benefits are paid as they are incurred. Relief benefits are not earned or accrued as a member's service increases. As such, a relief funded status is not calculated.

Pension Funded Status		
(Dollars in Millions)	2015	2016
a. Entry Age Normal Accrued Liability	\$188.5	\$190.0
b. Actuarial Value of Assets Allocated to Pensions	188.5	190.0
c. Unfunded Liability (a-b)	0.0	0.0
d. Funded Ratio (b/a)	100%	100%

Note: Totals may not agree due to rounding.

## Participant Data

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

Changes in Participant Data			
	2015	2016	Increase
<b>Actives</b>			
Number of Active Members in Relief Plan	11,831	11,532	(3%)
Number of Active Members in Pension Plan	9,802	9,434	(4%)
Percent of Volunteers Covered by Pension Plan	83%	82%	(1%)
Average Age	41.6	41.9	1%
Average Years of Service	10.8	10.8	0%
<b>Inactives</b>			
Number of Retirees/Beneficiaries	4,296	4,367	2%
Number of Terminated Vested Members	6,197	6,263	1%
Number of Survivors (Line of Duty)	11	11	0%
Number of Members with Permanent Disabilities	12	12	0%

## Actuarial Gain/Loss

The table below describes the various sources that contribute to the change in contribution rates from one year to the next. For each source, we compare the actual amount experienced by the plan to the amount we assumed. Any difference will increase or decrease the contribution requirements accordingly. The changes in contribution rates shown in the following table represent a summary of the Pension and Relief contribution rates. The Actuarial Gain/Loss tables in the **Actuarial Exhibits** section of the report provide further detail.

Change in Contribution Rates by Source			
	Pension NC*	Pension UAAL	Relief NC
<b>2015 Contribution Rate</b>	<b>\$98.78</b>	<b>\$0.00</b>	<b>\$311.85</b>
Expected Contribution Rate Change	0.00	0.00	0.00
Liability (Gains) / Losses	11.31	(11.52)	6.57
Asset (Gains) / Losses	0.00	11.52	(62.74)
PV of Future Service (Gains) / Losses	(10.77)	0.00	(23.74)
Incremental Changes (Gains) / Losses	0.60	0.00	0.64
Other (Gains) / Losses	0.00	0.00	0.00
<b>Total Change</b>	<b>\$1.14</b>	<b>\$0.00</b>	<b>(\$79.27)</b>
<b>2016 Preliminary Contribution Rate</b>	<b>\$99.92</b>	<b>\$0.00</b>	<b>\$232.58</b>
<b>Laws of 2017</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>2016 Contribution Rate</b>	<b>\$99.92</b>	<b>\$0.00</b>	<b>\$232.58</b>

\*Please see the Methods section of the Appendix for details on the modified version of the EAN cost method used. Non-standard sources of annual gain/loss are produced as a result.

## Significant Changes since the Prior Valuation

The following comments summarize the significant changes from the last valuation. Please see the **Actuarial Certification Letter** for additional comments on the 2016 valuation results.

Since the *2015 Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund Actuarial Valuation Report* (VAVR), the most significant impact to the plan can be attributed to the continued decline in overall active membership counts. An actuarial valuation does not assume new members join the system, however if more members leave the system than expected, it can have a significant impact on the results of the valuation.

The plan also experienced actuarial gains and losses as a result of economic and demographic experience that differed from our long-term assumptions. Actuarial gains will reduce contribution rates; actuarial losses will increase contribution rates. Under a reasonable set of actuarial assumptions and methods, actuarial gains and losses will offset over long-term experience periods.

The investment rate of return and the Fire Insurance Premium Tax have a significant impact on the assets of the plan. The rate of investment return on the actuarial value of assets for the plan year was lower than the assumed rate of 7 percent, which by itself would lead to an increase in contribution rates. However, we see an overall decrease in contribution rates after accounting for the funds received from the Fire Insurance Premium Tax. This year's allocation of the Fire Insurance Premium Tax to the pension fund was higher than in the prior years.

Some key demographic assumptions include termination, retirement, disability and death rates. The plan experienced both actuarial gains and losses on these demographic assumptions. Liabilities increased less than expected due to higher turnover and fewer active duty-related disablements and deaths, which decreased contribution rates. At the same time, liabilities increased more than expected due to new entrants, which increased contribution rates.

In addition, new entrants into the plan increase the Present Value of Future Service, so the number of years for collecting contributions is larger and this results in an actuarial gain to the system, thus lowering contribution rates.

Detailed gain and loss information by plan can be found in the **Actuarial Exhibits** section of this report.



SECTION TWO:  
Actuarial Exhibits







# Office of the State Actuary

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## **Actuarial Certification Letter Volunteer Fire Fighters’ and Reserve Officers’ Relief and Pension Fund Actuarial Valuation Report As of June 30, 2016**

October 2017

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, 2016, consistent with the Board’s adopted funding policy. This report should not be used for other purposes. Please replace this report when a more recent report becomes available.

To produce the valuation results summarized in this report, we performed calculations requiring assumptions about future economic and demographic events. As part of the *2009 Actuarial Valuation Report of the Relief Benefits*, healthcare actuaries from Milliman reviewed the healthcare assumptions and methods we used for the relief plan for reasonableness. We relied on Milliman’s expertise for these assumptions and methods since we are not healthcare actuaries. We relied on the medical trend rates based upon the [2015 PEBB OPEB Report](#). We also utilized termination and retirement assumptions developed in the *VFFRPF 2008-2013 Pension Experience Study*. Several other demographic assumptions rely on experience from other Washington State retirement systems and are detailed in the [2007-2012 Demographic 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.

The Board adopted the investment rate of return assumption, the amortization policy for the Unfunded Actuarial Accrued Liability (UAAL), and the asset valuation method used in this valuation. We believe the asset valuation method will reduce the UAAL contribution rate volatility produced by the Entry Age Normal (EAN) Actuarial Funding Method when used in combination with the existing asset allocation policy of the Washington State Investment Board (WSIB). The combination of the current asset smoothing method with any other funding method or asset allocation policy may not be appropriate.

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 EAN Actuarial Funding Method. The Board also adopted the policy to pre-fund the relief benefits using the

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



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Aggregate Actuarial Funding Method. 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 OSA are actively working together to further improve the quality of the data. We previously recommended the Board implement a new data collection process for the relief benefits. A more detailed reporting of medical expenditures on an individual member basis and collecting additional beneficiary data is important in preparing for future experience studies. We use 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.

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,

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

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

## Contribution Rates

We used the Entry Age Normal (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 (NC) rate and a rate to amortize the Unfunded Actuarial Accrued Liability (UAAL). We used the Aggregate Funding Method to determine the relief contribution rates as a level dollar amount.

The total pension contribution rate, which is the sum of the NC 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 contributions, employer contributions, and premium taxes are collected regularly.
- Benefit provisions remain the same.
- Assumptions prove reasonable.

We do not expect a smooth pattern of future contributions due to the variability of the premium tax on fire insurance policies. The plan receives a portion of the annual premium taxes, which serve as a main source of revenue for the system. See the **Actuarial Methods** section for more detail. Additionally, the method for allocating assets between the pension and relief plans, as well as the method for allocating the Fire Insurance Premium Tax between the pension and administrative expense funds, could amplify the annual volatility of the relief contribution rate.

<b>Pension and Relief Plans Required Annual Contributions</b>		
	<b>Per Person*</b>	<b>Total</b>
<b>Pension Benefits</b>	<i>(Dollars in Ones)</i>	<i>(Dollars in Thousands)</i>
Entry Age Normal Cost	\$99.92	\$943
Cost of UAAL	0.00	0
<b>Total Pension Rate</b>	<b>\$99.92</b>	<b>\$943</b>
<b>Relief Benefits</b>		
Aggregate Normal Cost	\$232.58	\$2,682
<b>Total Relief Rate</b>	<b>\$232.58</b>	<b>\$2,682</b>
<b>Operating Expenses</b>		
<b>Administration and Expenses**</b>	<b>\$33.02</b>	<b>\$381</b>
<b>Total for Pension, Relief, and Expenses</b>	<b>\$365.52</b>	<b>\$4,006</b>

\*The Per Person rate is based on the number of active members in the data.

\*\*Estimated using actual dollars.

Note: Totals may not agree due to rounding.

### Development of Pension Plan Normal Cost\*

<i>(Dollars in Thousands)</i>	<b>Total</b>
Future Value of Fully Projected Benefits	\$654,828
a. Present Value of Fully Projected Benefits (PVFB)	\$193,888
b. Entry Age Normal Actuarial Accrued Liability (AAL)	\$189,958
c. Present Value of Future Normal Costs (PVFNC) (a - b)	\$3,930
d. Present Value of Future Service (PVFS)**	39,332
<b>e. Per Person Entry Age Normal Cost (c / d in Dollars)</b>	<b>\$100</b>
f. Number of Active Members in Pension Plan	9,434
g. Entry Age Normal Cost (e x f)	\$943

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

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

Note: Totals may not agree due to rounding.

### Development of Pension Plan UAAL

<i>(Dollars in Thousands)</i>	<b>Total</b>
Future Value of Fully Projected Benefits	\$654,828
a. Present Value of Fully Projected Benefits (PVFB)	\$193,888
b. Actuarial Value of Assets (AVA) Allocated to Pensions	\$189,958
c. Unfunded PVFB (a - b)	\$3,930
d. Present Value of Future Normal Costs (PVFNC)	\$3,930
<b>e. Unfunded Actuarial Accrued Liability (UAAL) (c - d)</b>	<b>\$0</b>
f. Contribution to Amortize the UAAL (Rolling 15-Year)	\$0
g. Number of Active Members in Pension Plan	9,434
<b>h. Per Person UAAL Contribution (f / g in Dollars)</b>	<b>\$0</b>

Note: Totals may not agree due to rounding.

### Development of Relief Plan Normal Cost

<i>(Dollars in Thousands)</i>	<b>Total</b>
Future Value of Fully Projected Benefits	\$74,529
a. Present Value of Fully Projected Benefits (PVFB)	\$23,812
b. Actuarial Value of Assets (AVA)*	\$10,834
c. Unfunded PVFB (a - b)	\$12,978
d. Present Value of Future Service (PVFS)**	55,798
<b>e. Per Person Aggregate Normal Cost (c / d in Dollars)</b>	<b>\$233</b>
f. Number of Active Members in Relief Plan	11,532
g. Aggregate Normal Cost (e x f)	\$2,682

\*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.

Note: Totals may not agree due to rounding.

## Actuarial Liabilities

<b>Present Value of Benefits – Pension Plan*</b>		
<i>(Dollars in Thousands)</i>		
<b>Liability Measures</b>	<b>EAN AAL**</b>	<b>Fully Projected</b>
<b>Active Members</b>		
Retirement	\$40,800	\$42,719
Termination	13,261	14,902
Death Benefits	1,184	1,279
Withdrawal	1,742	2,017
<b>Total Actives</b>	<b>\$56,987</b>	<b>\$60,917</b>
<b>Inactive Members</b>		
Retirees	\$78,853	\$78,853
Terminated Vested	47,810	47,810
Survivor	6,308	6,308
<b>Total Inactives</b>	<b>\$132,971</b>	<b>\$132,971</b>
<b>2016 Total</b>	<b>\$189,958</b>	<b>\$193,888</b>
<b>2015 Total</b>	<b>\$188,510</b>	<b>\$192,568</b>

\*Includes pension benefits only.

\*\*Entry Age Normal Actuarial Accrued Liability.

Note: Totals may not agree due to rounding.

<b>Present Value of Benefits - Relief Plan*</b>	
<i>(Dollars in Thousands)</i>	
<b>Liability Measures</b>	<b>Fully Projected</b>
<b>Active Members</b>	
Duty Disability	\$3,082
Duty-Related Death	2,895
Medical and Temporary Disability	12,050
<b>Total Actives</b>	<b>\$18,027</b>
<b>Inactive Members</b>	
Survivor	\$3,053
Disability	2,732
<b>Total Inactives</b>	<b>\$5,784</b>
<b>2016 Total</b>	<b>\$23,812</b>
<b>2015 Total</b>	<b>\$23,945</b>

\*Includes relief benefits only.

Note: Totals may not agree due to rounding.

Fully Projected Benefit Payments											
<i>(Dollars in Thousands)</i>											
VFF - Pension Benefits											
Year	Future Value	Present Value	Year	Future Value	Present Value	Year	Future Value	Present Value	Year	Future Value	Present Value
2016	\$11,399	\$11,020	2041	\$13,460	\$2,398	2066	\$5,097	\$167	2091	\$368	\$2
2017	11,934	10,782	2042	13,136	2,187	2067	4,792	147	2092	300	2
2018	12,462	10,523	2043	12,799	1,991	2068	4,499	129	2093	242	1
2019	12,976	10,240	2044	12,436	1,808	2069	4,216	113	2094	192	1
2020	13,465	9,931	2045	12,063	1,639	2070	3,943	99	2095	151	1
2021	13,853	9,549	2046	11,682	1,484	2071	3,679	86	2096	117	1
2022	14,260	9,186	2047	11,342	1,346	2072	3,425	75	2097	89	0
2023	14,631	8,808	2048	10,974	1,217	2073	3,181	65	2098	67	0
2024	14,963	8,419	2049	10,627	1,102	2074	2,946	56	2099	50	0
2025	15,183	7,984	2050	10,240	992	2075	2,721	49	2100	37	0
2026	15,385	7,561	2051	9,873	894	2076	2,505	42	2101	27	0
2027	15,561	7,147	2052	9,512	805	2077	2,298	36	2102	19	0
2028	15,648	6,717	2053	9,175	726	2078	2,100	31	2103	14	0
2029	15,701	6,299	2054	8,853	654	2079	1,912	26	2104	9	0
2030	15,693	5,884	2055	8,531	589	2080	1,733	22	2105	6	0
2031	15,620	5,473	2056	8,213	530	2081	1,563	19	2106	4	0
2032	15,502	5,076	2057	7,919	478	2082	1,402	16	2107	3	0
2033	15,376	4,706	2058	7,623	430	2083	1,250	13	2108	2	0
2034	15,239	4,359	2059	7,317	386	2084	1,107	11	2109	1	0
2035	15,061	4,026	2060	7,021	346	2085	974	9	2110	1	0
2036	14,841	3,708	2061	6,715	309	2086	849	7	2111	1	0
2037	14,596	3,408	2062	6,399	275	2087	734	6	2112	0	0
2038	14,309	3,122	2063	6,072	244	2088	628	5	2113	0	0
2039	14,035	2,862	2064	5,739	216	2089	531	4	2114	0	0
2040	\$13,768	\$2,624	2065	\$5,413	\$190	2090	\$445	\$3	2115	\$0	\$0
<b>Total</b>										<b>\$654,828</b>	<b>\$193,888</b>

Fully Projected Benefit Payments											
<i>(Dollars in Thousands)</i>											
VFF - Relief Benefits											
Year	Future Value	Present Value	Year	Future Value	Present Value	Year	Future Value	Present Value	Year	Future Value	Present Value
2016	\$1,993	\$1,927	2041	\$1,284	\$229	2066	\$558	\$18	2091	\$143	\$1
2017	1,975	1,784	2042	1,262	210	2067	540	17	2092	128	1
2018	1,956	1,652	2043	1,239	193	2068	522	15	2093	114	1
2019	1,935	1,527	2044	1,215	177	2069	503	13	2094	100	0
2020	1,913	1,411	2045	1,191	162	2070	484	12	2095	87	0
2021	1,891	1,303	2046	1,165	148	2071	464	11	2096	74	0
2022	1,867	1,203	2047	1,137	135	2072	444	10	2097	62	0
2023	1,842	1,109	2048	1,107	123	2073	424	9	2098	52	0
2024	1,816	1,022	2049	1,076	112	2074	405	8	2099	43	0
2025	1,788	940	2050	1,043	101	2075	386	7	2100	35	0
2026	1,757	864	2051	1,008	91	2076	367	6	2101	28	0
2027	1,723	791	2052	971	82	2077	350	5	2102	22	0
2028	1,688	724	2053	934	74	2078	334	5	2103	17	0
2029	1,652	663	2054	895	66	2079	318	4	2104	13	0
2030	1,615	606	2055	856	59	2080	302	4	2105	9	0
2031	1,578	553	2056	818	53	2081	287	3	2106	7	0
2032	1,542	505	2057	781	47	2082	272	3	2107	5	0
2033	1,507	461	2058	747	42	2083	258	3	2108	3	0
2034	1,473	421	2059	715	38	2084	244	2	2109	2	0
2035	1,441	385	2060	687	34	2085	230	2	2110	1	0
2036	1,410	352	2061	661	30	2086	216	2	2111	1	0
2037	1,382	323	2062	637	27	2087	201	2	2112	1	0
2038	1,356	296	2063	616	25	2088	187	1	2113	0	0
2039	1,331	271	2064	595	22	2089	172	1	2114	0	0
2040	\$1,307	\$249	2065	\$576	\$20	2090	\$158	\$1	2115	\$0	\$0
<b>Total</b>										<b>\$74,529</b>	<b>\$23,812</b>

# Assets

<b>Change in Market Value of Assets</b>	
<i>(Dollars in Thousands)</i>	
<b>Market Value as of June 30, 2015</b>	<b>\$207,855</b>
<b>Revenue</b>	
Member Pension Contributions	\$67
Employer Pension Contributions	444
Relief Plan Contributions	474
Investment Earnings Net of Expenses	5,126
Net Fire Insurance Premium Tax*	7,235
<b>Total Revenue</b>	<b>\$13,346</b>
<b>Disbursements</b>	
Refunds	\$16
Expenses	11
Disability and Survivor Benefits	539
Miscellaneous	0
Medical Benefits	1,194
Retirement Pensions (monthly and lump sums)	10,779
<b>Total Disbursements</b>	<b>\$12,539</b>
<b>Market Value as of June 30, 2016</b>	<b>\$208,662</b>

*\*BVFF allocated \$1.10M to their admin account for the 2015-17 Biennium. Actual admin costs for the prior year were approximately \$381K.*

*Note: Totals may not agree due to rounding.*



Calculation of the Actuarial Value of Assets			
Assets as of June 30, 2015			
<i>(Dollars in Thousands)</i>			
a. Market Value of Assets			\$207,855
b. Deferred Investment Gains (Losses)			13,380
c. Actuarial Value of Assets (a-b)			\$194,475
d. Ratio of Actuarial Value to Market Value (c/a)			94%
Assets as of June 30, 2016			
<i>(Dollars in Thousands)</i>			
<b>a. Market Value at 6/30/2016</b>			<b>\$208,662</b>
b. Deferred Gains and (Losses)			
Plan Year Ending	Years Deferred	Years Remaining	
6/30/2016	5	4	(7,317)
6/30/2015	3	1	(1,708)
6/30/2014	8	5	12,518
6/30/2013	5	1	1,569
6/30/2012	6	1	(1,439)
6/30/2011	8	2	4,248
6/30/2010	4	0	0
Total Deferral			\$7,870
<b>c. Market Value less Deferral (a - b)</b>			<b>\$200,792</b>
d. 70% of Market Value of Assets			\$146,063
e. 130% of Market Value of Assets			\$271,261
<b>f. Actuarial Value of Assets*</b>			<b>\$200,792</b>
<b>g. Ratio of Actuarial Value to Market Value (f/a)</b>			<b>96%</b>

\*The actuarial value of assets may not exceed 130% nor drop below 70% of the Market Value of Assets.

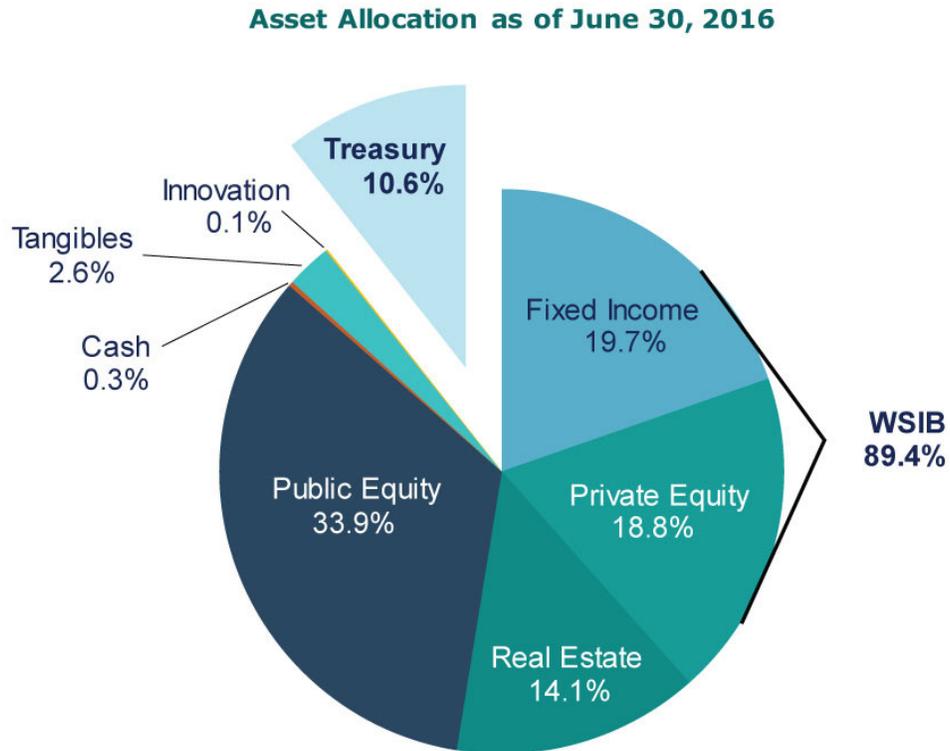
Note: Totals may not agree due to rounding.

The Board for Volunteer Fire Fighters and Reserve Officers (the Board) established the plan’s asset fund to pay for both pension and relief benefits. They chose to allocate the assets to pensions up to the Actuarial Accrued Liability (AAL) for the pension plan with any remaining assets allocated to relief benefits. The table below summarizes the allocation of the assets to the pension and relief plans.

Allocation of Assets by Plan			
<i>(Dollars in Millions)</i>	Pension	Relief	Total
Actuarial Value of Assets	\$190.0	\$10.8	\$200.8

The assumed 7.0 percent investment Rate of Return (ROR) for the plan assets is based upon a weighted average of the expected ROR for the assets in the Treasury and the Washington State Investment Board (WSIB) accounts. On a long-term basis, we expect the Treasury investments to earn 3.75 percent per year and the WSIB investments to earn 7.5 percent per year net of expenses. The distribution of total plan assets between each account fluctuates by year and is monitored by the

Board to ensure adequate assets in the Treasury account to make benefit payments. The graph below shows details of the asset allocation for the plan.



*The VFF asset allocation as of the valuation date includes assets in the WSIB CTF, which comprise a vast majority of the VFF assets. The remaining VFF assets are held in the Treasury and are invested in short-term bonds.*

<b>Annual Income vs. Costs</b>	
<i>(Dollars in Thousands)</i>	
<b>Pension and Relief Plans</b>	<b>Total</b>
<b>Actuarial Costs</b>	
Entry Age Normal Cost	\$943
UAAL (Surplus)	\$0
Total Pension	\$943
Relief Aggregate Normal Cost	\$2,682
<b>Total Actuarial Costs</b>	<b>\$3,625</b>
<b>Income</b>	
<b>State</b>	
Fire Insurance Premium Tax	\$7,235
Allocation to Administrative Fund	\$0
<b>Total State</b>	<b>\$7,235</b>
<b>Pension</b>	
Employee	\$277
Employer	\$277
Other Pension*	\$19
<b>Total Pension</b>	<b>\$574</b>
<b>Relief</b>	
Employer**	\$338
Other Relief*	\$59
<b>Total Relief</b>	<b>\$398</b>
<b>Total Income</b>	<b>\$8,206</b>
<b>Surplus (Deficit) Income</b>	<b>\$4,581</b>

\*Emergency Medical Services Districts and Reserve Law Enforcement Officers pay the full cost of their benefits.

\*\*Relief fees based on the rate of \$30.00 per member.

Note: Totals may not agree due to rounding.

## 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 Actuarial Value of Assets (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 on-going 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 Market Value of Assets (MVA) by deferring a portion of annual investment gains or losses for a certain number of years.

Investment gains and losses occur when the annual return on investments varies from the long-term assumed rate of 7 percent. The AVA provides a more stable measure of the plan's assets on an on-going 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 Present Value of Future Benefits and the pension's Present Value of Future Normal Cost. 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 June 30, 2010, actuarial valuation, 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.

We do not calculate an actuarial accrued liability for the relief plan since the relief benefits are paid as they are incurred. Relief benefits are not earned or accrued as a member's service increases. As such, a funded status is not calculated. Please see the Development of Relief Plan Normal Cost for a comparison of the present value of future relief benefits to the assets on hand for (allocated to) relief benefits.

<b>Pension Funded Status on Actuarial Value Basis</b>			
<i>(Dollars in Thousands)</i>			
<b>Entry Age Normal Accrued Liability<sup>1</sup></b>	<b>\$189,958</b>		
<b>Actuarial Value of Assets<sup>2</sup></b>	<b>189,958</b>		
<b>Unfunded Liability</b>	<b>\$0</b>		
<b>Funded Ratio</b>			
<b>June 30, 2016<sup>2</sup></b>	<b>100%</b>	December 31, 2002 <sup>3</sup>	122%
June 30, 2015 <sup>2,4</sup>	100%	December 31, 2001 <sup>4</sup>	142%
June 30, 2014 <sup>2,4</sup>	100%	December 31, 2000 <sup>4</sup>	144%
June 30, 2013 <sup>2,4</sup>	99%	December 31, 1999	132%
June 30, 2012 <sup>2</sup>	100%	December 31, 1998 <sup>3</sup>	120%
June 30, 2011 <sup>2</sup>	100%	December 31, 1997	144%
June 30, 2010 <sup>2</sup>	100%	December 31, 1996	129%
June 30, 2009 <sup>3</sup>	102%	December 31, 1995 <sup>4</sup>	118%
June 30, 2008	105%	December 31, 1994	112%
June 30, 2007 <sup>4</sup>	107%	December 31, 1993 <sup>4</sup>	114%
December 31, 2006	103%	December 31, 1992	108%
December 31, 2005 <sup>4</sup>	95%	December 31, 1991 <sup>3</sup>	103%
December 31, 2004	113%	December 31, 1990	111%
December 31, 2003	116%	December 31, 1989 <sup>4</sup>	112%

<sup>1</sup> Prior to 2007 we used the Projected Unit Credit Liability to calculate the funded status.

<sup>2</sup> Excess assets above Pension AAL are allocated to Relief Benefits.

<sup>3</sup> Benefits increased.

<sup>4</sup> 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 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 table below shows how the funded status changes when we use different interest rate assumptions. We calculated the liabilities using a 6.25 percent and 7.75 percent ROR to show this sensitivity.

Pension Funded Status at Variable Interest Rate Assumptions			
<i>(Dollars in Thousands)</i>	6.25% ROR	7.00% ROR	7.75% ROR
<b>Entry Age Normal Accrued Liability</b>	<b>\$207,116</b>	<b>\$189,958</b>	<b>\$175,128</b>
<b>Actuarial Value of Assets<sup>1</sup></b>	<b>200,792</b>	<b>189,958</b>	<b>175,128</b>
<b>Unfunded Liability</b>	<b>\$6,323</b>	<b>\$0</b>	<b>\$0</b>
<b>Funded Ratio</b>			
<b>June 30, 2016<sup>1</sup></b>	<b>97%</b>	<b>100%</b>	<b>100%</b>
June 30, 2015 <sup>1,3</sup>	94%	100%	100%
June 30, 2014 <sup>1,3</sup>	93%	100%	100%
June 30, 2013 <sup>1,3</sup>	91%	99%	100%
June 30, 2012 <sup>1</sup>	96%	100%	100%
June 30, 2011 <sup>1</sup>	95%	100%	100%
June 30, 2010 <sup>1</sup>	93%	100%	100%
June 30, 2009 <sup>2</sup>	93%	102%	111%
June 30, 2008	96%	105%	115%

<sup>1</sup> Excess assets above Pension AAL are allocated to Relief Benefits.

<sup>2</sup> Actuarial assumptions changed.

<sup>3</sup> 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** — We assume future investment returns at a rate of 7 percent per year, net of expenses. The investment return assumption represents the average annual rate of 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. 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. The dollar-weighted annual rate of return was 2.5 percent on the MVA for the year ending June 30, 2016 (the valuation date).
- 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. However, since the administrative cost for the entire 2015-17 Biennium was accounted for in the prior valuation, no portion of the Fire Insurance Premium Tax is allocated to the administrative fund for this valuation. Thus, the entire 40 percent of the premium tax went into the pension fund, which results in more assets on hand and a decrease in contribution rates.

<b>Premium Taxes Contributed to Plan</b>			
<i>(Dollars in Thousands)</i>			
<b>Year</b>			
<b>2016</b>	\$7,235	<b>2002</b>	\$3,605
<b>2015</b>	\$5,903	<b>2001</b>	\$3,320
<b>2014</b>	\$6,383	<b>2000</b>	\$2,869
<b>2013</b>	\$5,958	<b>1999</b>	\$2,706
<b>2012</b>	\$5,602	<b>1998</b>	\$2,285
<b>2011</b>	\$5,815	<b>1997</b>	\$2,539
<b>2010</b>	\$5,685	<b>1996</b>	\$2,973
<b>2009</b>	\$5,794	<b>1995</b>	\$2,330
<b>2008</b>	\$5,853	<b>1994</b>	\$2,370
<b>2007</b>	\$5,689	<b>1993</b>	\$2,016
<b>2006</b>	\$5,186	<b>1992</b>	\$1,736
<b>2005</b>	\$4,808	<b>1991</b>	\$2,081
<b>2004</b>	\$4,726	<b>1990</b>	\$1,892
<b>2003</b>	\$4,112	<b>1989</b>	\$1,900

## Demographic Experience

The table below displays the various modes of entry into and exit from the VFF system. For each, we compare the actual counts to our expected counts over the 2016 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 every few years as part of our Experience Studies.

<b>Actual vs. Expected Demographic Counts</b>			
	<b>Actual</b>	<b>Expected</b>	<b>Act/Exp</b>
<b>New Entrants</b>	1,539	N/A	N/A
<b>Retirements</b>	86	217.9	0.39
<b>Terminations</b>	1,502	1,180.0	1.27
<b>Active Deaths</b>	4	23.0	0.17
<b>Active Disabilities</b>	0	1.2	0.00
<b>Inactive Deaths*</b>	242	268.4	0.90

*\*Excludes terminated and vested records that cashout or become missing records.*

## Actuarial Gain/Loss

Since the 2015 VAVR, the key actuarial gains and losses impacted the results of this valuation as follows.

- **Pension Normal Cost Rate experienced a net increase.**
  - Due to new members joining the system, we experienced a loss on pension liabilities but a gain on the Present Value of Future Service (PVFS). The net impact of these two was a loss, increasing rates.
  - A correction change caused an additional slight rate increase.
- **Pension UAAL Rate remains at zero.**
  - Overall liability gains decreased contribution rates. Liability gains are primarily attributable to more active members terminating than expected, while the losses are attributable to new members joining the pension plan and members returning to active volunteer service.
  - Despite the annual rate of investment return falling short of our expectation, after taking into account the amount received from the Fire Insurance Premium Tax, we see an asset gain, which decreases the pension UAAL contribution rate.
  - The AVA continues to exceed the accrued pension liability, so the pension UAAL remains at zero. The AVA amount that exceeds the accrued pension liability is included in the calculation of the relief contribution rate.
- **Relief Normal Cost Rate experienced a net decrease.**
  - Due to new members joining the system, we experienced a loss on medical costs but a gain on the Present Value of Future Service (PVFS). The net impact of these two was a loss, increasing rates.
  - A correction change caused an additional slight rate increase.
  - However, excess assets from the pension fund are shifted to the relief fund, yielding an asset gain and lowering contribution rates. This gain outweighs the losses above, and results in an overall reduction in rates.

<b>Change in Pension Normal Cost Rate by Source*</b>	
<b>2015 Pension Normal Cost Rate</b>	<b>\$98.78</b>
<b>Liabilities</b>	
Termination	(\$5.87)
Retirement	0.45
Mortality	0.23
Growth / Return to Work	15.30
Other Liabilities	1.20
<b>Total Liabilities (Gains) / Losses</b>	<b>\$11.31</b>
<b>PV of Future Service (Gains) / Losses</b>	<b>(\$10.77)</b>
<b>Incremental Changes</b>	
Plan Changes	0.00
Method Changes	0.00
Assumption Changes	0.00
Corrections	0.60
<b>Total Incremental Changes (Gains) / Losses</b>	<b>\$0.60</b>
<b>Other (Gains) / Losses</b>	<b>\$0.00</b>
<b>Total Change</b>	<b>\$1.14</b>
<b>2016 Preliminary Pension Normal Cost Rate</b>	<b>\$99.92</b>
Laws of 2017	0.00
<b>2016 Pension Normal Cost Rate</b>	<b>\$99.92</b>

*\*Please see the Actuarial Methods section for details on the modified version of the EAN cost method used. Non-standard sources of annual gain/loss are produced as a result.*



<b>Change in Pension UAAL Rate by Source</b>	
<b>2015 Pension UAAL Rate</b>	<b>\$0.00</b>
<b>Expected UAAL Rate Change</b>	<b>\$0.00</b>
<b>Liabilities</b>	
Termination	(\$7.50)
Retirement	(1.24)
Mortality	(6.70)
Growth / Return to Work	7.86
Other Liabilities	(3.94)
<b>Total Liabilities (Gains) / Losses</b>	<b>(\$11.52)</b>
<b>Assets</b>	
Investment Return	(\$29.08)
Allocation of Excess Pension Assets*	40.60
<b>Total Assets (Gains) / Losses</b>	<b>\$11.52</b>
<b>Incremental Changes</b>	
Plan Changes	\$0.00
Method Changes	0.00
Assumption Changes	0.00
Corrections	0.00
<b>Total Incremental Changes (Gains) / Losses</b>	<b>\$0.00</b>
<b>Other (Gains) / Losses</b>	<b>\$0.00</b>
<b>Total Change</b>	<b>\$0.00</b>
<b>2016 Preliminary Pension UAAL Rate</b>	<b>\$0.00</b>
Laws of 2017	0.00
<b>2016 Pension UAAL Rate</b>	<b>\$0.00</b>

*\*Based on the funding policy adopted by the Board, assets are allocated to pension benefits first (up to the pension plan accrued liability), and to relief second.*



<b>Change in Relief Normal Cost Rate by Source</b>	
<b>2015 Relief Normal Cost Rate</b>	<b>\$311.85</b>
<b>Liabilities</b>	
Termination	(\$8.51)
Retirement	0.10
Disability	(9.96)
Mortality	(7.18)
Growth / Return to Work	
Medical	40.24
Non-Medical	19.28
Other Non-Medical	(7.23)
Medical	(20.74)
Other Liabilities	0.58
<b>Total Liabilities (Gains) / Losses</b>	<b>\$6.57</b>
<b>Assets</b>	
Investment Return	(\$1.61)
Allocation of Excess Pension Assets*	(61.13)
<b>Total Assets (Gains) / Losses</b>	<b>(\$62.74)</b>
<b>PV of Future Service (Gains) / Losses</b>	<b>(\$23.74)</b>
<b>Incremental Changes</b>	
Plan Changes	\$0.00
Method Changes	0.00
Assumption Changes	0.00
Corrections	0.64
<b>Total Incremental Changes (Gains) / Losses</b>	<b>\$0.64</b>
<b>Other (Gains) / Losses</b>	<b>\$0.00</b>
<b>Total Change</b>	<b>(\$79.27)</b>
<b>2016 Preliminary Relief Normal Cost Rate</b>	<b>\$232.58</b>
Laws of 2017	0.00
<b>2016 Relief Normal Cost Rate</b>	<b>\$232.58</b>

*\*Based on the funding policy adopted by the Board, assets are allocated to pension benefits first (up to the pension plan accrued liability), and to relief second.*



## Effect of Plan, Method, Assumption, and Correction Changes

### Plan Changes

- None.

### Method Changes

- None.

### Assumption Changes

- None.

### Corrections

- **Terminated and Vested Member Benefits** – We made a correction to our programming in valuing benefits for members who are terminated and vested. Prior to this correction, we applied early retirement factors and the percentage of survivors who select annuities at the time of termination, rather than at the time of death.
- **Beneficiaries and Line of Duty Death Survivor Data** – A data correction was made to properly value survivors as single life annuitants based on their age and gender.

Per Person Annual Contribution Rates				
Valuation Year	2015 Final	Data & Asset Changes*	Incremental Changes**	2016 Final
<b>Pension Rate</b>				
Employee	\$30	\$0	\$0	\$30
Employer	30	0	0	30
State	39	1	0	40
Normal Cost Rate	\$99	\$1	\$0	\$100
State UAAL or (Surplus) Rate	0	0	0	0
<b>Total Pension Rate</b>	<b>\$99</b>	<b>\$1</b>	<b>\$0</b>	<b>\$100</b>
<b>Relief Rate</b>				
Employer	\$30	\$0	\$0	\$30
State	282	(80)	0	203
<b>Total Relief Rate</b>	<b>\$312</b>	<b>(\$80)</b>	<b>\$0</b>	<b>\$233</b>

\*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





Membership Data					
Actives	2012	2013	2014	2015	2016
Number of Members in Relief System	12,631	12,290	12,151	11,831	11,532
Average Age	40.2	40.6	40.4	40.7	40.8
Average Total Service	8.7	9.8	9.6	9.7	9.6
Number of Emergency Medical Technicians	57	64	73	62	65
Number of Reserve Law Enforcement Officer	238	228	227	216	190
Number of Active Members Also Receiving a Pension	37	86	54	82	76
Number of Members in Pension System	10,432	10,230	10,093	9,802	9,434
Percent of Volunteers Covered	83%	83%	83%	83%	82%
Average Age	41.5	41.6	41.5	41.6	41.9
Average Total Service	9.9	10.8	10.8	10.8	10.8
Average Pension Benefit Service	8.9	8.9	8.9	8.9	9.0
Number of Emergency Medical Technicians	31	35	35	28	30
Number of Reserve Law Enforcement Officer	210	203	198	185	158
<b>Retirees</b>					
Number of Retirees/Beneficiaries	3,971	4,117	4,208	4,296	4,367
Average Age	74.3	74.4	74.6	75.0	74.9
Number of New Retirees	237	214	220	180	202
Average Annual Benefit	\$2,198	\$2,201	\$2,217	\$2,232	\$2,245
Total Annual Benefit Payments	\$8,729,864	\$9,062,937	\$9,330,521	\$9,586,607	\$9,804,953
<b>Terminated Vested</b>					
Number of Terminated Vested	6,174	6,123	6,092	6,197	6,263
<b>Relief Annuities</b>					
Number of Duty-Death Survivors	14	14	11	11	11
Average Age	74.1	75.2	71.6	69.2	67.7
Average Annual Benefit	\$20,264	\$20,984	\$21,425	\$21,718	\$22,045
Number of Duty-Related Disabled	13	13	14	12	12
Average Age	66.2	67.2	67.6	67.0	68.0
Average Annual Benefit	\$22,762	\$23,571	\$24,184	\$24,256	\$24,252

PARTICIPANT DATA

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	228	157	117	65	45	34	25	40	1,109
2	362	174	136	88	76	47	36	31	27	977
3-4	360	267	201	170	122	84	71	58	73	1,406
5-9	186	369	302	313	225	217	140	127	201	2,080
10-14	1	75	217	192	209	177	165	119	140	1,295
15-19	0	0	56	125	156	119	152	113	153	874
20-24	0	0	0	44	95	137	136	138	176	726
25 +	0	0	0	0	25	70	171	297	404	967
<b>Total</b>	<b>1,307</b>	<b>1,113</b>	<b>1,069</b>	<b>1,049</b>	<b>973</b>	<b>896</b>	<b>905</b>	<b>908</b>	<b>1,214</b>	<b>9,434</b>

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	876	417	313	213	116	85	81	61	108	2,270
2	482	225	172	112	91	58	41	41	39	1,261
3-4	429	323	243	188	135	96	87	69	96	1,666
5-9	197	410	322	325	236	232	156	146	268	2,292
10-14	1	77	222	198	214	185	171	130	169	1,367
15-19	0	0	57	125	156	120	152	116	164	890
20-24	0	0	0	44	95	137	136	142	183	737
25 +	0	0	0	0	25	70	172	300	482	1,049
<b>Total</b>	<b>1,985</b>	<b>1,452</b>	<b>1,329</b>	<b>1,205</b>	<b>1,068</b>	<b>983</b>	<b>996</b>	<b>1,005</b>	<b>1,509</b>	<b>11,532</b>





Pension Retirees*					
Age	Number of Retirees	Average Annual Benefit	Age	Number of Retirees	Average Annual Benefit
60	36	\$1,466	76	170	\$2,171
61	8	\$1,825	77	176	\$2,230
62	22	\$1,589	78	183	\$2,009
63	45	\$1,801	79	179	\$2,083
64	65	\$2,098	80	141	\$2,168
65	111	\$2,368	81	137	\$2,128
66	208	\$2,400	82	126	\$2,188
67	202	\$2,345	83	114	\$2,301
68	209	\$2,340	84	99	\$2,157
69	263	\$2,311	85	77	\$2,186
70	240	\$2,339	86	96	\$2,227
71	230	\$2,377	87	74	\$2,312
72	209	\$2,312	88	64	\$2,168
73	227	\$2,339	89	50	\$2,276
74	232	\$2,263	90 +	171	\$2,243
75	203	\$2,291	<b>Total</b>	<b>4,367</b>	<b>\$2,245</b>

\*Includes beneficiaries of service retirees.

Line-of-Duty Death Survivors			Retirees with Disabilities		
Age	Number of Survivors	Average Annual Benefit	Age	Number of Retirees	Average Annual Benefit
<60	5	\$22,045	<60	1	\$22,045
60-74	0	0	60-74	6	24,252
75-89	5	22,045	75-89	5	24,694
90+	1	\$22,045	90+	0	\$0
<b>Total</b>	<b>11</b>	<b>\$22,045</b>	<b>Total</b>	<b>12</b>	<b>\$24,252</b>



SECTION FOUR:  
Appendices





# Actuarial Assumptions

## Decrement Rates

- Disability Rates** — To value disability benefits under the relief plan, we used the duty disability rates developed for the 2009 relief valuation. We assume duty related disability rates increase with age. The older the Volunteer Fire Fighter (VFF) relief member is, the higher the probability of duty-related disability.
- Termination Rates** — Termination rates are modeled as a function of Membership Service. Rates increase at 25 years when members reach the maximum pension benefit level.
- Retirement Rates** — Retirement rates begin at age 60 for active members. We assume that terminated members with vested benefits will defer retirement to age 65.

Probability of Disability*	
Age	Rate
19	0.000%
20	0.008%
25	0.009%
30	0.010%
35	0.011%
40	0.012%
45	0.013%
50	0.014%
55	0.015%
60	0.016%
65	0.017%
70	0.018%
75	0.019%
79	0.020%
80	0.000%

\*The rates are linearly interpolated between the ages.

Probability of Retirement*		
Age	MS** < 25	MS >= 25
59	0%	0%
60	7%	7%
61	9%	9%
62	11%	11%
63	9%	9%
64	12%	12%
65	38%	90%
66-79	19%	90%
80	100%	100%

\*For calculating the Pension PVFS, we assume 100% retirement at 25 years of service.

\*\*Membership Service

Probability of Termination	
Service Years*	All Ages
0	17%
1	18%
2	19%
3	19%
4	18%
5	15%
6	14%
7	13%
8	12%
9	11%
10	10%
11	9%
12	9%
13	9%
14	9%
15	7%
16	6%
17	6%
18	6%
19	5%
20	5%
21	5%
22	5%
23	6%
24	8%
25	13%
26	11%
27+	9%

\*The service based reduction factors for pension benefits improve at 10, 15, 20, and 25 years of membership service. For calculating the Pension PVFS, we assume 100% termination at 25 years of service.

- Mortality Rates** — We use the Public Employees’ Retirement System (PERS) mortality rates for the VFF plan. The PERS rates are based on the RP-2000 Combined Healthy and RP-2000 Disabled Mortality Tables with generational improvements using 100 percent of Scale BB. The Society of Actuaries published both the RP-2000 and Scale BB tables. Please see [leg.wa.gov/osa](http://leg.wa.gov/osa) for the actuarial valuation report for more details on the development of these tables.

Base Mortality Rates and Projection Scale									
RP-2000 Healthy		100% Scale BB*		RP-2000 Healthy		100% Scale BB*			
Age	Male	Female	Male	Female	Age	Male	Female	Male	Female
19	0.000000	0.000000	0.000	0.000	42	0.001215	0.000852	0.003	0.003
20	0.000345	0.000191	0.003	0.003	43	0.001299	0.000937	0.003	0.003
21	0.000357	0.000192	0.003	0.003	44	0.001397	0.001029	0.003	0.003
22	0.000366	0.000194	0.003	0.003	45	0.001508	0.001124	0.003	0.003
23	0.000373	0.000197	0.003	0.003	46	0.001616	0.001223	0.003	0.003
24	0.000376	0.000201	0.003	0.003	47	0.001734	0.001326	0.003	0.003
25	0.000376	0.000207	0.003	0.003	48	0.001860	0.001434	0.003	0.003
26	0.000378	0.000214	0.003	0.003	49	0.001995	0.001550	0.003	0.003
27	0.000382	0.000223	0.003	0.003	50	0.002138	0.001676	0.003	0.003
28	0.000393	0.000235	0.003	0.003	51	0.002449	0.001852	0.003	0.003
29	0.000412	0.000248	0.003	0.003	52	0.002667	0.002018	0.003	0.003
30	0.000444	0.000264	0.003	0.003	53	0.002916	0.002207	0.003	0.003
31	0.000499	0.000307	0.003	0.003	54	0.003196	0.002424	0.003	0.004
32	0.000562	0.000350	0.003	0.003	55	0.003624	0.002717	0.003	0.005
33	0.000631	0.000394	0.003	0.003	56	0.004200	0.003090	0.003	0.006
34	0.000702	0.000435	0.003	0.003	57	0.004693	0.003478	0.004	0.007
35	0.000773	0.000475	0.003	0.003	58	0.005273	0.003923	0.005	0.008
36	0.000841	0.000514	0.003	0.003	59	0.005945	0.004441	0.006	0.009
37	0.000904	0.000554	0.003	0.003	60	0.006747	0.005055	0.007	0.010
38	0.000964	0.000598	0.003	0.003	61	0.007676	0.005814	0.008	0.011
39	0.001021	0.000648	0.003	0.003	62	0.008757	0.006657	0.009	0.012
40	0.001079	0.000706	0.003	0.003	63	0.010012	0.007648	0.010	0.012
41	0.001142	0.000774	0.003	0.003	64	0.011280	0.008619	0.011	0.012

\*Scale BB represents annual improvements in mortality rates.

Base Mortality Rates and Projection Scale (continued)									
RP-2000 Healthy		100% Scale BB*		RP-2000 Healthy		100% Scale BB*			
Age	Male	Female	Male	Female	Age	Male	Female	Male	Female
65	0.012737	0.009706	0.012	0.012	88	0.150590	0.107303	0.013	0.012
66	0.014409	0.010954	0.013	0.012	89	0.166420	0.119154	0.012	0.012
67	0.016075	0.012163	0.014	0.012	90	0.183408	0.131682	0.011	0.011
68	0.017871	0.013445	0.015	0.012	91	0.199769	0.144604	0.010	0.010
69	0.019802	0.014860	0.015	0.012	92	0.216605	0.157618	0.009	0.009
70	0.022206	0.016742	0.015	0.012	93	0.233662	0.170433	0.008	0.008
71	0.024570	0.018579	0.015	0.012	94	0.250693	0.182799	0.007	0.007
72	0.027281	0.020665	0.015	0.012	95	0.267491	0.194509	0.006	0.006
73	0.030387	0.022970	0.015	0.012	96	0.283905	0.205379	0.005	0.005
74	0.033900	0.025458	0.015	0.012	97	0.299852	0.215240	0.004	0.004
75	0.037834	0.028106	0.015	0.012	98	0.315296	0.223947	0.004	0.004
76	0.042169	0.030966	0.015	0.012	99	0.330207	0.231387	0.003	0.003
77	0.046906	0.034105	0.015	0.012	100	0.344556	0.237467	0.003	0.003
78	0.052123	0.037595	0.015	0.012	101	0.358628	0.244834	0.002	0.002
79	0.057927	0.041506	0.015	0.012	102	0.371685	0.254498	0.002	0.002
80	0.064368	0.045879	0.015	0.012	103	0.383040	0.266044	0.001	0.001
81	0.072041	0.050780	0.015	0.012	104	0.392003	0.279055	0.001	0.001
82	0.080486	0.056294	0.015	0.012	105	0.397886	0.293116	0.000	0.000
83	0.089718	0.062506	0.015	0.012	106	0.400000	0.307811	0.000	0.000
84	0.099779	0.069517	0.015	0.012	107	0.400000	0.322725	0.000	0.000
85	0.110757	0.077446	0.015	0.012	108	0.400000	0.337441	0.000	0.000
86	0.122797	0.086376	0.015	0.012	109	0.400000	0.351544	0.000	0.000
87	0.136043	0.096337	0.014	0.012	110	1.000000	1.000000	0.000	0.000

\*Scale BB represents annual improvements in mortality rates.

For display purposes only, we show a unisex mortality table below based upon the percent male assumption described later in this section and applied it to the active and retired member population. We use the opposite percent male assumption when applying the mortality table to surviving spouses.

Mortality Rates Projected to 2031

Age	Member	Survivor	Disabled												
19	0.000300	0.000188	0.019360	42	0.001007	0.000739	0.019360	65	0.007575	0.006111	0.034203	88	0.088237	0.068703	0.109924
20	0.000300	0.000188	0.019360	43	0.001074	0.000809	0.019360	66	0.008309	0.006857	0.034687	89	0.100600	0.076781	0.117963
21	0.000300	0.000188	0.019360	44	0.001150	0.000887	0.019360	67	0.009130	0.007711	0.035255	90	0.114757	0.087921	0.131379
22	0.000310	0.000190	0.019360	45	0.001239	0.000971	0.019360	68	0.009892	0.008536	0.035916	91	0.130522	0.100219	0.146991
23	0.000317	0.000193	0.019360	46	0.001339	0.001059	0.020483	69	0.010992	0.009442	0.037660	92	0.146774	0.113429	0.163763
24	0.000324	0.000195	0.019360	47	0.001436	0.001150	0.021611	70	0.012178	0.010438	0.039574	93	0.164263	0.127475	0.181552
25	0.000327	0.000199	0.019360	48	0.001543	0.001245	0.022745	71	0.013661	0.011753	0.041673	94	0.182852	0.142168	0.200354
26	0.000328	0.000204	0.019360	49	0.001656	0.001345	0.023885	72	0.015119	0.013039	0.043967	95	0.202393	0.157322	0.219844
27	0.000329	0.000210	0.019360	50	0.001777	0.001453	0.025034	73	0.016790	0.014499	0.046467	96	0.222746	0.172764	0.239904
28	0.000334	0.000218	0.019360	51	0.001906	0.001569	0.026190	74	0.018698	0.016121	0.049177	97	0.243799	0.188318	0.260458
29	0.000344	0.000228	0.019360	52	0.002177	0.001741	0.027351	75	0.020848	0.017881	0.052101	98	0.257344	0.197564	0.273660
30	0.000360	0.000241	0.019360	53	0.002371	0.001898	0.028517	76	0.023246	0.019766	0.055232	99	0.278934	0.212354	0.294479
31	0.000389	0.000257	0.019360	54	0.002586	0.002020	0.029642	77	0.025885	0.021809	0.058565	100	0.291837	0.219812	0.306911
32	0.000438	0.000298	0.019360	55	0.002828	0.002159	0.030762	78	0.028770	0.024048	0.062087	101	0.313758	0.233242	0.328319
33	0.000493	0.000338	0.019360	56	0.003197	0.002360	0.031878	79	0.031948	0.026535	0.065781	102	0.326352	0.240796	0.340343
34	0.000553	0.000381	0.019360	57	0.003587	0.002607	0.032122	80	0.035487	0.029319	0.069628	103	0.348973	0.258087	0.361082
35	0.000616	0.000420	0.019360	58	0.003887	0.002842	0.032339	81	0.039417	0.032429	0.073610	104	0.360000	0.269261	0.370191
36	0.000677	0.000460	0.019360	59	0.004235	0.003105	0.032537	82	0.044076	0.035944	0.077712	105	0.380708	0.290350	0.387409
37	0.000736	0.000498	0.019360	60	0.004629	0.003405	0.032730	83	0.049212	0.039885	0.081918	106	0.387409	0.303593	0.390781
38	0.000792	0.000537	0.019360	61	0.005093	0.003755	0.032929	84	0.054841	0.044309	0.086221	107	0.390781	0.317030	0.392273
39	0.000845	0.000578	0.019360	62	0.005620	0.004179	0.033146	85	0.060990	0.049278	0.090616	108	0.392273	0.330453	0.393744
40	0.000896	0.000624	0.019360	63	0.006230	0.004762	0.033446	86	0.067720	0.054874	0.095099	109	0.393744	0.343697	0.395154
41	0.000949	0.000677	0.019360	64	0.006921	0.005445	0.033794	87	0.077327	0.061401	0.102309	110	1.000000	1.000000	1.000000

Note: The projection year selected above is 15 years past the valuation date. This year was selected as a reasonable proxy for all members on average and is intended for illustrative purposes only. The valuation uses generational mortality rates as opposed to a static projection year. These mortality rates were blended for display purposes using the 90% Male assumption. Utilizes PERS age offset assumption of -1 Male, -1 Female.

## Pension Benefit Assumptions

- Purchase of Membership Service Credit** — We assume all eligible members will purchase service credits 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.
- Ratio of Survivors Selecting Annuities** — Upon the death of a terminated vested member, we assume 31 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. Upon the death of an active member, we assume this probability increases with age as shown in the table above. These assumptions are consistent with those selected for PERS 2.
- 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, consistent with PERS 2.

Ratio of Survivors Selecting Annuities	
Age	Rate
39	0.000%
40	2.106%
45	13.847%
50	25.656%
55	37.464%
60	49.273%
62+	57.296%

*Note: This assumption has been blended based upon our 90% Male assumption for display purposes only.*

## Relief Benefit Assumptions

The following assumptions were developed in the *2009 Actuarial Valuation of the Relief Benefits*, the *2015 Economic Experience Study*, and the *2007-2012 Demographic Experience Study* for the plans administered by the Department of Retirement Systems.

- Annual Cost-of-Living Adjustment (COLA)** — We assume a 2.75 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.
- Duty-Related Death Rate** — We assume the VFF duty-related death rate is  $1/12,000 = 0.0083$  percent. The duty-related death rate is a constant probability, regardless of age.
- 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 64.2 percent of the active population is married, consistent with the Law Enforcement Officers’ and Fire Fighters’ (LEOFF) Plan 2. 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.
- **Number of Dependent Children** — We assume 0.61 constant over all ages of VFF relief members.
- **Duration of Child Annuity** — We assume the average age of a child receiving a VFF relief annuity is eight years old. As a result, we assume that the child based annuities will be paid for ten years.
- **Annual Medical Inflation** — To estimate future medical costs, we chose to apply the medical inflation assumptions from our [2015 Other Post-Employment Benefits Actuarial Valuation Report](#). Based upon the self-insured nature of the VFF relief plan, we assumed the medical inflation trend is consistent with the 2015 Uniform Medical Plan Non-Medicare rates excluding the provision for excise taxes since we assume they do not apply to this plan.

**Miscellaneous Assumptions**

- **Valuation Interest Rate** — We assumed an annual investment rate of return of 7 percent.
- **Percent Male** — We assume 90 percent male for the entire population consistent with LEOFF 2. We only use this assumption when the gender of a spouse is unknown. Otherwise, we use the gender as reported by the Board for Volunteer Fire Fighters (the Board).

Medical Inflation	
Valuation Year	Rate
2016	3.7%
2017	4.6%
2018 - 2019	5.5%
2020 - 2021	5.6%
2022 - 2023	5.7%
2024 - 2030	5.8%
2031 - 2036	5.9%
2037	5.8%
2038 - 2039	5.7%
2040 - 2045	5.6%
2046 - 2060	5.5%
2061 - 2062	5.4%
2063	5.3%
2064	5.2%
2065 - 2066	5.1%
2067	5.0%
2068 - 2069	4.9%
2070	4.8%
2071+	4.7%

## Actuarial Methods

### Asset Valuation Method

An asset valuation method is generally used to adjust the market value of assets and smooth the effects of short-term volatility. The adjusted assets are called the Actuarial Value of Assets (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 Market Value of Assets (MVA) to reflect the difference between the actual investment return and the expected investment return during each of the last eight years at the following annual recognition rates per year.

Annual Gain/Loss		
Rate of Return	Smoothing Period	Annual Recognition
<b>14% and up</b>	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%
<b>0% and lower</b>	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 Entry Age Normal (EAN) Actuarial Cost Method is comprised of two components:

- Normal Cost (NC).
- Unfunded Actuarial Accrued Liability (UAAL).

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

We use the EAN Actuarial Cost Method to develop the pension contribution rates. The Pension NC 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 Present Value of Future Benefits (PVFB) over the Present Value of Future Normal Costs (PVFNC) and the AVA. In other words, the amount of liabilities that are not covered by the sum of current assets and future contributions.

$$\text{In equation form: UAAL} = \text{PVFB} - \text{PVFNC} - \text{AVA.}$$

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 NC is the level dollar amount that would fund all projected future relief benefits of today's members. The relief plan's NC contribution rate is developed by amortizing the relief's Unfunded PVFB over the Present Value of Future Service (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 relief members.

Currently, the decrement rates extend beyond 25 years of service, which is the maximum number of pension payments members may make. For the purposes of determining the PVFS for pensions, we assume all members leave active service once they reach 25 years of service.

## Methods for Medical Benefits

Duty-related medical benefits, temporary disability payments, and physical exams are valued using age-based premiums. The estimated “payments” for temporary disability and physical exams are assumed to increase by the 2.75 percent inflation assumption. The medical benefits are assumed to increase by medical inflation. The per-person cost, as of the valuation date, for each benefit is \$134.42 for medical, \$14.87 for temporary disability, and \$10.81 for physicals. These costs include an adjustment from a mid-year timing to a beginning of year timing to properly model the premium payment within the technical limitation of our valuation software.

## Operating Expenses

We used the actual administration and other miscellaneous expenses incurred last year to determine this year’s operating expenses.

## Summary of Plan Provisions

The following pension and relief benefits are provided to volunteer fire fighters.

- 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 2015 payment amounts.

## 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. Reserve law enforcement officers and emergency medical technicians are required to pay the full amount adopted annually by the Board. That amount for the 2017 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 reserve law enforcement officers and emergency medical technicians are required to pay the full amount adopted annually by the Board. That amount for the 2017 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

- 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 table below.
- 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 post-retirement COLA applied to the benefit.

## Membership Service Factor for Retirement

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

## Age Factor for Retirement

Age Factor						
Age Factor	60	61	62	63	64	65
	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 Reserve Law Enforcement Officers. The pension provisions mirror those of the EMSDs.
- Chapter 148, Laws of 1999 extended the membership provisions of the relief plan to include Reserve Law Enforcement Officers. 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 Payments

### RCW 41.24.150

- **Duty Disability** — Members receive temporary duty disability payments of \$3,674.10 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 \$1,837.05 per month, their spouse receives \$367.96, and each dependent child receives \$158.49. Disability benefits are subject to a maximum of \$3,674.10 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).
- **Non-Duty Disability** — None.

## Death Benefits

### RCW 41.24.160, 41.24.230

- **Survivors** — Surviving spouses of members who die while on active duty shall be paid \$1,837.05 monthly. An additional \$514.46 is paid monthly 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.

## Glossary

Please see the [Glossary](#) on our website.





Washington State Volunteer Fire Fighters'  
and Reserve Officers' Relief and Pension Fund

2016 Actuarial Valuation

**OCTOBER 2017**



Office of the  
State Actuary

*"Supporting financial security for generations."*