Washington State

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

2010 Actuarial Valuation Report

October 2011

Board for Volunteer Fire Fighters and Reserve Officers

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Office of the State Actuary

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A special thank you to Elizabeth Hyde for the use of her photographs "Number 2" and "Engine One."

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Relief and Pension Fund
Actuarial Valuation Report
As of June 30, 2010
Released October 2011

As required under RCW 41.24.320, this report documents the results of the actuarial valuation 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, 2010. 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. We also invite you to visit our website, at the address below, for further information regarding the actuarial funding of the Washington State retirement systems.

Sincerely,

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State Actuary

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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 Report (VAVR) is to:

- Develop contribution rates to pre-fund the pension and relief benefits under current funding policy.
- Measure the pension system's funding progress.
- Compare experience with assumptions used.
- Detect significant demographic changes.
- Highlight significant plan, assumption, and method changes.

We don't intend this report to satisfy the accounting requirements under the Governmental Accounting Standards Board (GASB) rules.

Funding Policy

The Board for Volunteer Fire Fighters' and Reserve Officers' relies on systematic actuarial funding to finance the on-going cost of the pension and relief plans. 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 which 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 Appendix for additional details on the actuarial funding methods.

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 Funding Method. This rate includes the normal cost rate, plus a rate to amortize the unfunded actuarial accrued liability. We determine the per-person level dollar contribution rate required to pre-fund relief benefits using the Aggregate Funding Method.

Per Person Annual Contributions		
Valuation Year	2009	2010
Pension Rate		
Employee	$30	$30
Employer	30	30
State	61	59
Normal Cost Rate	$121	$119
State UAAL Rate	0	0
Total Pension Rate	$121	$119
Relief Rate		
Employer	$30	$30
State	274	273
Total Relief Rate	$304	$303
Operating Expenses		
Administration and Expenses	$37	$38

Note: The 2009 Pension UAAL includes the impact of the 2009 RAVR. Please see the Effect of Plan, Assumption, and Method Changes section of this report for details on how the contribution rates changed.

We determined the operating expense rate based on the actual annual costs from the prior year. Only members of the pension plan and their employers pay for the pension costs. All employers of members pay for the relief costs and operating expenses.

Actuarial Liabilities

Actuarial Liabilities		
(Dollars in Millions)	2009	2010
Present Value of Future Benefits		
Pension Benefits	$168.7	$171.3
Relief Benefits	$23.8	$24.0
Pension Plan		
Entry Age Normal Accrued Liability	$163.0	$165.6
Unfunded Actuarial Accrued Liability	$0.0	$0.0
Valuation Interest Rate	7.00%	7.00%

Note: The 2009 Pension UAAL includes the impact of the 2009 RAVR. Please see the Effect of Plan, Assumption, and Method Changes section of this report for details on how the contribution rates changed.

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)	**2009**	**2010**
Market Value of Assets	$135.1	$144.4
Actuarial Value of Assets	165.7	168.8
Contributions*	0.6	1.1
Disbursements	10.1	10.1
Investment Return	(27.6)	12.6
Other**	$5.7	$5.7
Rate of Return on Assets***	(17.1%)	10.4%

** Employee, Employer, and Relief contributions have been added starting in 2010.*

*** Includes the Fire Insurance Premium Tax and Administrative Expenses.*

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

Funded Status

The funded status of the 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 Entry Age Normal (EAN) accrued pension liabilities calculated using the long-term interest rate assumption.

Based on the new funding policy, any assets above the pension plan AAL are allocated to fund the relief benefits. As a result, the pension plan will remain 100 percent funded provided total assets exceed the pension 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 relief funded status is not calculated.

Pension Funded Status		
(Dollars in Millions)	**2009**	**2010**
a. Entry Age Normal Accrued Liability	$163.0	$165.6
b. Actuarial Value of Assets	163.0	165.6
c. Unfunded Liability (a-b)*	$0.0	$0.0
d. Funded Ratio (b/a)	100%	100%

Note: Totals may not agree due to rounding.

** The 2009 Pension UAAL includes the impact of the 2009 RAVR. Please see the Effect of Plan, Assumption, and Method Changes section of this report for details on how the contribution rates changed.*

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 starting July 1 of the prior year and ending June 30 of the year shown.

Changes in Participant Data			
	2009	2010	Increase
Actives			
Number of Active Members in Relief Plan*	13,417	13,327	(1%)
Number of Active Members in Pension Plan	10,758	10,812	1%
Percent of Volunteers Covered by Pension Plan	80%	81%	1%
Average Age	41.7	41.5	(1%)
Average Years of Service	10.2	9.9	(3%)
Inactives			
Number of Retirees/Beneficiaries	3,612	3,712	3%
Number of Terminated Vested Members	6,059	6,119	1%
Number of Survivors (Line of Duty)	14	14	0%
Number of Members with Permanent Disabilities	13	13	0%

**Includes 66 Emergency Medical Technicians and 274 Reserve Law Enforcement Officers in 2010.*

Actuarial Gain / Loss

This table 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 the total 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
2009 Contribution Rate	**$120.75**	**$0.00**	**$303.61**
Liability (Gains) / Losses	17.49	(8.48)	2.86
Asset (Gains) / Losses	0.00	8.48	24.02
PV of Future Service (Gains) / Losses	(18.77)	0.00	(33.53)
Incremental Changes (Gains) / Losses	(0.00)	0.64	0.20
Other (Gains) / Losses	(0.01)	(0.64)	6.08
Total Change	**($1.29)**	**$0.00**	**($0.38)**
2010 Preliminary Contribution Rate	**$119.46**	**$0.00**	**$303.23**
Laws of 2011	0.00	0.00	0.00
2010 Contribution Rate	**$119.46**	**$0.00**	**$303.23**

**We use a modified version of the Entry Age Normal (EAN) cost method. This modified version produces non-standard sources of annual gain/loss. Please see the Development of Pension Plan Normal Cost for details on the modified EAN cost method used in this valuation.*

Significant Changes Since the Prior Valuation

The following comments summarize the highlights of changes from the last valuation. Please see the Actuarial Certification for additional comments on the 2010 valuation results.

Since the 2009 Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund Actuarial Valuation Report (VAVR), we included the relief benefits in our valuation model as outlined in the Plan Provisions section of this report. The addition of these benefits did not impact pension benefits or pension liabilities, but lowered the assets available to fund pensions. This is based on the new funding policy, where any assets above the pension plan AAL are allocated to fund the relief benefits. As a result, the pension plan funded status decreased to 100 percent.

In addition, the plan 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 key gains and losses that impacted the results of this valuation include the following:

- The Market Value of Assets (MVA) annual investment rate of return was 10.4 percent in 2010. However, after recognizing a percentage of the deferred losses from the big recession of 2008-2009, the AVA increased by 3.9 percent compared to the 7.0 percent we expected. This asset loss caused the pension UAAL and relief normal cost rates to increase.
    - The relief normal cost rate increase due to the loss on assets was significantly larger because of the asset allocation adopted by the Board. As a result of allocating only assets above the pension plan accrued liability, we expect to see more volatility in the relief rate. On the other hand, we expect to see less volatility in the pension rate. Additionally, the asset loss for the relief plan can also be explained in part by not making the full actuarially required contribution.
- The actual 2010 Present Value of Future Service (PVFS) was higher than we expected. As a result, this gain caused the pension and relief normal cost rates to decrease. The gain in the PVFS is attributable to new members who joined the pension and relief plans.
- The pension UAAL rate experienced liability gains, which decreased contribution rates. Primarily, these gains are attributable to fewer deaths and more terminations than expected.
- The pension and relief normal cost rates experienced liability losses, which increased contribution rates. Primarily, these losses are attributable to new members joining the plan.

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

Section Two

Actuarial Exhibits

Actuarial Certification Letter
Volunteer Fire Fighters' and Reserve Officers'
Relief and Pension Fund
Actuarial Valuation Report
As of June 30, 2010
Released October 2011

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, 2010, consistent with the Board's adopted funding policy. This report should not be used for other purposes.

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 our healthcare assumptions and methods for reasonableness. We relied on their expertise for these assumptions and methods since we are not healthcare actuaries. We developed the demographic assumptions in the *2001-2006 Experience Study*. The demographic assumptions include recognition of future improvements in assumed mortality, based on 50 percent of Scale AA. 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.

The Board adopted the investment rate of return assumption used in this valuation, and the amortization policy for the Unfunded Actuarial Accrued Liability. The Board also adopted a new asset valuation method in 2008, which we included in the 2007 Volunteer Fire Fighters' Actuarial Valuation Report (VAVR). We believe the method will reduce the 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 Entry Age Normal actuarial funding method. The Board also adopted the policy to pre-fund the relief

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benefits using the Aggregate actuarial funding method. We selected all other assumptions and methods used in this valuation.

The Board provided us with member, beneficiary, and relief benefit data. The Board implemented a new data collection process in 2007 and the 2010 data showed continued improvement. 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 actuarial 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. However, we recommend the Board implement a new data collection process for the relief benefits. 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. The Board and OSA are actively working together to further improve the quality of the data.

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, met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Sincerely,

Matthew M. Smith, FCA, EA, MAAA	Lisa A. Won, ASA, MAAA
State Actuary	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.
- The Legislature does not increase benefits.
- 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 revenue source of the system. See the Actuarial Methods section of the Appendices for more detail. Additionally, the method for allocating assets between the pension and relief plans could amplify the annual volatility of the relief contribution rate.

Pension and Relief Plans Required Annual Contributions		
	Per Person*	Total
Pension Benefits	*(Dollars in Ones)*	*(Dollars in Thousands)*
Entry Age Normal Cost	$119.46	$1,292
Cost of UAAL	0.00	0
Total Pension Rate	**$119.46**	**$1,292**
Relief Benefits		
Aggregate Normal Cost	$303.23	$4,041
Total Relief Rate	**$303.23**	**$4,041**
Operating Expenses		
Administration and Expenses**	**$37.81**	**$504**
Total for Pension, Relief, and Expenses	**$460.50**	**$5,837**

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

*** Estimated using actual dollars.*

Notes: Totals may not agree due to rounding. Only members of the pension plan pay for the pension costs. All employers of members pay for the relief costs and operating expenses. Emergency medical service districts and reserve law enforcement officers employers pay the full cost of their benefits, including administration expenses.

Actuarial Liabilities

Present Value of Benefits - Pension Plan*		
Liability Measures *(Dollars in Thousands)*	**Entry Age Normal**	**Fully Projected**
Active Members		
Retirement	$40,574	$43,630
Termination	12,239	14,319
Death Benefits	1,010	1,126
Withdrawal	1,532	1,979
Total Actives	**$55,356**	**$61,053**
Inactive Members		
Retirees	$64,127	$64,127
Terminated Vested	41,388	41,388
Survivor	4,758	4,758
Total Inactives	**$110,272**	**$110,272**
2010 Total	**$165,628**	**$171,325**
2009 Total	**$162,996**	**$168,717**

Note: Totals may not agree due to rounding.

** Includes pension benefits only.*

Present Value of Benefits - Relief Plan*	
Liability Measures *(Dollars in Thousands)*	**Fully Projected**
Active Members	
Duty Disability	$3,665
Duty-Related Death	2,758
Medical and Temporary Disability	11,608
Total Actives	**$18,030**
Inactive Members	
Survivor	$3,128
Disability	2,882
Total Inactives	**$6,010**
2010 Total	**$24,040**
2009 Total	**$23,785**

Note: Totals may not agree due to rounding.

** Includes relief benefits only.*

Development of Pension Plan Normal Cost*	
(Dollars in Thousands)	**Total**
a. Present Value of Fully Projected Benefits (PVFB)	$171,325
b. Entry Age Normal Actuarial Accrued Liability (AAL)	$165,628
c. Present Value of Future Normal Costs (PVFNC) (a - b)	$5,697
d. Present Value of Future Service (PVFS)**	47,694
e. Per Person Entry Age Normal Cost (c / d in Dollars)	**$119**
f. Number of Active Members in Pension Plan	10,812
g. Entry Age Normal Cost (e x f)	$1,292

Note: Totals may not agree due to rounding.

** We use a modified version of the Entry Age Normal cost method since members of the pension plan do not contribute beyond 25 years of service, but can continue to volunteer beyond 25 years. We calculate the EAN accrued liability over all future years of service, but calculate the present value of future service over no more than 25 years of service for purposes of calculating the normal cost.*

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

Development of Pension Plan UAAL	
(Dollars in Thousands)	**Total**
a. Present Value of Fully Projected Benefits (PVFB)	$171,325
b. Actuarial Value of Assets (AVA)	$165,628
c. Unfunded PVFB (a - b)	$5,697
d. Present Value of Future Normal Costs (PVFNC)	$5,697
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	10,812
h. Per Person UAAL Contribution (f / g in Dollars)	**$0**

Note: Totals may not agree due to rounding.

Development of Relief Plan Normal Cost	
(Dollars in Thousands)	**Total**
a. Present Value of Fully Projected Benefits (PVFB)	$24,040
b. Actuarial Value of Assets (AVA)*	$3,124
c. Unfunded PVFB (a - b)	$20,916
d. Present Value of Future Service (PVFS)**	68,976
e. Per Person Aggregate Normal Cost (c / d in Dollars)	**$303**
f. Number of Active Members in Relief Plan	13,327
g. Aggregate Normal Cost (e x f)	$4,041

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.*

Assets

Change in Market Value of Assets	
(Dollars in Thousands)	
Market Value as of June 30, 2009	$135,082
Revenue*	
Member Pension Contributions	131
Employer Pension Contributions	504
Relief Plan Contributions	512
Investment Earnings Net of Expenses	12,596
Net Fire Insurance Premium Tax	5,685
Allocation to the Administration Fund**	0
Total Revenue	**$19,429**
Disbursements	
Refunds	18
Expenses	8
Disability and Survivor Benefits	691
Miscellaneous	(3)
Medical Benefits	1,043
Retirement Pensions (monthly and lump sums)	8,372
Total Disbursements	**$10,130**
Market Value as of June 30, 2010	$144,381

Note: Totals may not agree due to rounding.

**We applied a ratio adjustment to the Member, Employer, and Relief contributions due to an accounting error reported by BVFF.*

***Actual admin costs = $503,898. BVFF chose not to retain additional assets since their admin fund had sufficient reserves in 2010.*

Calculation of the Actuarial Value of Assets			
Assets as of June 30, 2009			
(Dollars in Thousands)			
(a) Market Value of Assets			$135,082
(b) Deferred Investment Gains (Losses)			(30,599)
(c) Actuarial Value of Assets (a-b)			$165,681
(d) Ratio of Actuarial Value to Market Value (c/a)			123%
Assets as of June 30, 2010			
(Dollars in Thousands)			
(a) Market Value at 6/30/2010			**$144,381**
(b) Deferred Gains and (Losses)			
Plan Year Ending	Years Deferred	Years Remaining	
6/30/2010	4	3	3,291
6/30/2009	8	6	(29,132)
6/30/2008	8	5	(7,323)
6/30/2007	8	4	4,163
12/31/2006	8	3	3,940
12/31/2005	7	1	690
Total Deferral			($24,371)
(c) Market Value less Deferral (a - b)			**$168,752**
(d) 70% of Market Value of Assets			$101,067
(e) 130% of Market Value of Assets			$187,695
(f) Actuarial Value of Assets*			**$168,752**
(g) Ratio of Actuarial Value to Market Value (f/a)			**117%**

Note: Totals may not agree due to rounding.

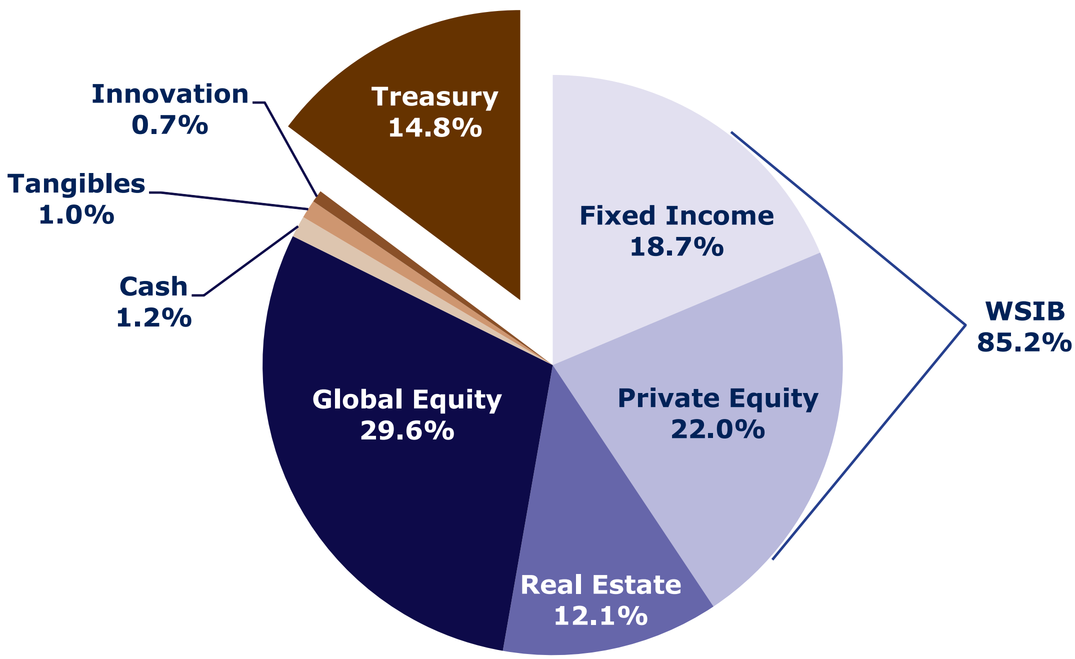
**The actuarial value of assets may not exceed 130% nor drop below 70% of the market value of assets.*

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 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. This allocation produces zero UAAL for the pension plan this reporting period.

Allocation of Assets by Plan			
(Dollars in Millions)	**Pension**	**Relief**	**Total**
Actuarial Value of Assets	$165.6	$3.1	$168.8

The assumed 7 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 WSIB accounts. On a long-term basis, we expect the Treasury investments to earn 4.5 percent per year and the WSIB investments to earn 8 percent per year. The distribution of total plan assets between each account fluctuates by year and is monitored by the Board. The graph below shows details of the asset allocation for the plan as of June 30, 2010.

Asset Allocation as of June 30, 2010



The Washington State Investment Board (WSIB) asset allocation for the year ending June 30, 2010, includes assets in the Commingled Trust Fund (CTF), which comprise 85.2% of the VFF assets. The remaining 14.8% of VFF assets are held in the Treasury and are invested in short-term bonds.

Annual Income vs. Costs	
Pension and Relief Plans	**Total**
(Dollars in Thousands)	
Actuarial Costs	
Entry Age Normal Cost	$1,292
UAAL (Surplus)	0
Total Pension	**$1,292**
Relief Aggregate Normal Cost	$4,041
Total Actuarial Costs	**$5,333**
Income	
Fire Insurance Premium Tax	$5,685
Administration and Expenses	(504)
Pension	
Employee	314
Employer	314
Other Pension*	41
Total Pension	**$669**
Relief	
Employer**	$392
Other Relief*	81
Total Relief	**$473**
Total Income	**$6,323**
Surplus (deficit) Income	**$990**

Note: Totals may not agree due to rounding.

**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.*

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. This measure compares the Actuarial Value of Assets (AVA) to the pension plan's EAN liabilities calculated using a long-term interest rate assumption.

The funded status on an actuarial value basis 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 smoothes 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. The EAN accrued pension liabilities are based on the difference between the pension's Present Value of Future Benefits (PVFB) and the pension's Present Value of Future Normal Cost (PVFNC). In other words, the EAN accrued pension 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.

Based on the funding policy adopted by the Board, any assets above the pension plan AAL are allocated to fund the relief benefits. As a result, the funded status of the pension plan will remain 100 percent provided 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.

Pension Funded Status on Actuarial Value Basis	
(Dollars in Thousands)	
Entry Age Normal Accrued Liability[1]	**$165,628**
Actuarial Value of Assets[2]	**165,628**
Unfunded Liability	**$0**
Funded Ratio	
June 30, 2010[2]	100%
June 30, 2009[3]	102%
June 30, 2008	105%
June 30, 2007[4]	107%
December 31, 2006	103%
December 31, 2005[4]	95%
December 31, 2004	113%
December 31, 2003	116%
December 31, 2002[3]	122%
December 31, 2001[4]	142%
December 31, 2000[4]	144%
December 31, 1999	132%
December 31, 1998[3]	120%
December 31, 1997	144%
December 31, 1996	129%
December 31, 1995[4]	118%
December 31, 1994	112%
December 31, 1993[4]	114%
December 31, 1992	108%
December 31, 1991[3]	103%
December 31, 1990	111%
December 31, 1989[4]	112%
December 31, 1988	98%

[1] Prior to 2007 we used the Projected Unit Credit Liability to calculate the funded status.

[2] Excess assets above Pension AAL used for Relief.

[3] Benefits increased.

[4] Actuarial assumptions changed.

The present value of actuarial liabilities is sensitive to the interest rate assumption. This table 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 Rate of Return (ROR) to show this sensitivity.

Pension Funded Status at Variable Interest Rate Assumptions			
(Dollars in Thousands)	6.25% ROR	7.00% ROR	7.75% ROR
Entry Age Normal Accrued Liability	**$180,982**	**$165,628**	**$152,309**
Actuarial Value of Assets*	**168,752**	**165,628**	**152,309**
Unfunded Liability	**$12,230**	**$0**	**$0**
Funded Ratio			
June 30, 2010*	93%	100%	100%
June 30, 2009**	93%	102%	111%
June 30, 2008	96%	105%	115%
June 30, 2007***	98%	107%	117%

**Excess assets above Pension AAL used for Relief.*

***Benefits increased.*

****Actuarial assumptions changed.*

Economic Experience

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

- **Investment Returns** – We assume future investment returns at a rate of 7.0 percent per year. 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 fluctuations in the AVA due to the underlying volatility in the MVA. The dollar-weighted annual rate of return was 10.4 percent on the MVA for the year ending June 10, 2010 (the valuation date). Comparatively, the plans annual return on the AVA was 3.9 percent for the year ending on the valuation date.
- **Premium Tax** - As the state's contribution to the plan, the Office of the State Treasurer (OST) contributes 40 percent of the premium tax paid on fire insurance policies to fund the plan. The level of annual premium tax fluctuates because the amount of the contribution equals the total amount paid by insurers to guarantee associations.

Premium Taxes Contributed to Plan	
Year	*(Dollars in Thousands)*
2010	$5,685
2009	$5,794
2008	$5,853
2007	$5,689
2006	$5,186
2005	$4,808
2004	$4,726
2003	$4,112
2002	$3,605
2001	$3,320
2000	$2,869
1999	$2,706
1998	$2,285
1997	$2,539
1996	$2,973
1995	$2,330
1994	$2,370
1993	$2,016
1992	$1,736
1991	$2,081
1990	$1,892
1989	$1,900

Demographic Experience

Actual vs. Expected Demographic Counts			
Counts by Decrement Type	Actual	Expected	Act / Exp
New Entrants	1,889	N/A	0.00
Retirements	92	156	0.59
Terminations	1,461	1,188	1.23
Deaths - Actives	13	20	0.65
Active Disabilities	0	N/A	0.00
Deaths - Inactives	181	202	0.90

Actuarial Gain / Loss

Change in Pension Normal Cost Rate by Source*	
2009 Pension Normal Cost Rate	$120.75
Liabilities	
Termination	(4.85)
Retirement	0.07
Mortality	0.20
Growth / Return to Work	20.20
Other Liabilities	1.87
Total Liabilities (Gains) / Losses	**17.49**
PV of Future Service (Gains) / Losses	**(18.77)**
Incremental Changes	
Plan Changes	0.00
Method Changes	(0.00)
Assumption Changes	(0.06)
Correction Changes	0.07
Total Incremental Changes (Gains) / Losses	**(0.00)**
Other (Gains) / Losses	**(0.01)**
Total Change	($1.29)
2010 Preliminary Pension Normal Cost Rate	$119.46
Laws of 2011	0.00
2010 Pension Normal Cost Rate	$119.46

**We use a modified version of the Entry Age Normal (EAN) cost method. This modified version produces non-standard sources of annual gain/loss. Please see the Development of Pension Plan Normal Cost for details on the modified EAN cost method used in this valuation.*

Change in Pension UAAL Rate by Source	
2009 Pension UAAL Rate	**$0.00**
Liabilities	
Termination	(5.85)
Retirement	(0.88)
Mortality	(12.17)
Growth / Return to Work	6.57
Other Liabilities	3.85
Total Liabilities (Gains) / Losses	**(8.48)**
Assets (Gains) / Losses	**8.48**
Incremental Changes	
Plan Changes	0.00
Method Changes	(0.00)
Assumption Changes	(0.23)
Correction Changes	0.87
Total Incremental Changes (Gains) / Losses	**0.64**
Other (Gains) / Losses	**(0.64)**
Total Change	**$0.00**
2010 Preliminary Pension UAAL Rate	**$0.00**
Laws of 2011	0.00
2010 Pension UAAL Rate	**$0.00**

Change in Relief Normal Cost Rate by Source	
2009 Relief Normal Cost Rate	**$303.61**
Liabilities	
Termination	(7.15)
Retirement	(0.13)
Disability	(8.76)
Mortality	(4.09)
Growth / Return to Work	17.78
Other Non-Medical	(2.12)
Medical	7.32
Total Liabilities (Gains) / Losses	**2.86**
Assets (Gains) / Losses	**24.02**
PV of Future Service (Gains) / Losses	**(33.53)**
Incremental Changes	
Plan Changes	0.00
Method Changes	0.00
Assumption Changes	0.00
Correction Changes	0.20
Total Incremental Changes (Gains) / Losses	**0.20**
Other (Gains) / Losses	**6.08**
Total Change	**($0.38)**
2010 Preliminary Relief Normal Cost Rate	**$303.23**
Laws of 2011	0.00
2010 Relief Normal Cost Rate	**$303.23**

Effect of Plan, Assumption, and Method Changes

Per Person Annual Contribution Rates				
Valuation Year	2009	Incremental	Relief	2010
Pension Rate	Final	Changes	Funding	Final
Employee	$30	$30	$30	$30
Employer	30	30	30	30
State	61	61	61	59
Normal Cost Rate	$121	$121	$121	$119
State UAAL or (Surplus) Rate	(26)	(25)	0	0
Total Pension Rate	$95	$96	$121	$119
Relief Rate				
Employer	$30	$30	$30	$30
State	109	109	274	273
Total Relief Rate	$139	$139	$304	$303

Plan Changes

- **Relief Benefits Funding Method** – The Board established a fund to provide for both pension and relief benefits. The current funding policy pre-funds pension benefits using the Entry Age Normal actuarial funding method and pays for relief benefits on a pay-as-you-go basis. Effective with the 2012 calendar year, the Board adopted a new policy to pre-fund the relief benefits using the Aggregate actuarial funding method.

Assumption Changes

- **Disability Rates** – We added rates of pre-retirement disablement to the pension and relief valuation model. Prior to the 2009 RAVR, we did not distinguish between a member who exits the system via termination/retirement and disability because the member will receive the same pension benefit. In other words, the termination and retirement rates in the 2009 VAVR included disability rates. We now value the pension benefits for those who exit the system via disability separately from termination and retirement.
- **Relief Benefit Assumptions** – As documented in the 2009 RAVR, we developed numerous assumptions for purposes of valuing the relief plan benefits. These assumptions have not changed for this valuation.

Method Changes

- **Pension Benefits for Survivors of Active Volunteers** – We made a correction in our model for survivors who receive pension benefits upon the death of an active member. Previously we only calculated pension benefits for the survivor of active non-duty deaths. We now calculate the annuity or return of contribution benefits in addition to the relief benefits for survivors of active members who die as a result of duty-related causes.

Section Three

Participant Data

Membership Data

Actives	2005	2006	2007*	2008**	2009	2010***
Members in Relief System	14,185	15,591	14,066	13,393	13,418	13,327
Average Age					40.0	39.9
Average Total Service					8.6	8.5
Members in Pension System	11,926	11,627	11,212	10,842	10,758	10,812
Percent of Volunteers Covered	84%	75%	80%	81%	80%	81%
Average Age	41.2	41.4	41.4	41.5	41.7	41.5
Average Total Service	10.2	10.3	9.5	10.2	10.2	9.9
Average Pension Benefit Service	8.7	7.5	9.1	9.1	9.2	8.9
Active Emergency Med. Technicians	38	40	33	27	26	66
Active Reserve Law Enf. Officer	288	283	255	243	234	274
Retirees						
Number of Retirees/Beneficiaries	3,208	3,309	3,437	3,575	3,612	3,712
Average Age	73.3	73.6	73.5	73.4	74.0	74.0
New Retirees	190	193	107	212	198	202
Average Annual Benefit	$2,144	$2,149	$2,152	$2,158	$2,161	$2,177
Annual Benefit Payments	$6,877,952	$7,111,901	$7,396,862	$7,715,572	$7,803,870	$8,081,282
Terminated Vested						
Number of Terminated Vested	4,891	4,966	5,211	5,866	6,059	6,119
Relief Annuities						
Number of Duty-Death Survivors	14	15	17	17	14	14
Average Age					71.2	72.2
Average Annual Benefit					$19,073	$19,853
Number of Duty-Related Disabled	13	13	14	13	13	13
Average Age					63.3	64.3
Average Annual Benefit					$21,424	$22,300

** New Retirees count updated to reflect six-month valuation year.*

*** Retired counts include members who retired after the valuation date.*

**** Prior to 2010, EMT and Reserve LEO counts included only members participating in the pension plan.*

Pension Active Members - Age and Membership Service Distribution

Membership Service	Attained Age									
	< 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60+	Total
1	752	372	302	192	157	97	86	45	55	2,058
2	295	173	130	105	79	62	53	29	28	954
3-4	304	250	221	164	126	117	80	44	67	1,373
5-9	153	395	326	371	297	274	218	146	172	2,352
10-14	1	59	184	185	207	226	176	164	118	1,320
15-19	0	0	34	128	189	192	190	155	151	1,039
20-24	0	0	0	8	89	140	210	175	161	783
25 +	0	0	0	0	9	98	223	304	299	933
Total	1,505	1,249	1,197	1,153	1,153	1,206	1,236	1,062	1,051	**10,812**

Relief Active Members - Age and Membership Service Distribution

Membership Service	Attained Age									
	< 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60+	Total
1	1,573	663	514	309	235	162	151	84	129	3,820
2	359	221	152	123	91	71	61	41	52	1,171
3-4	372	303	242	188	142	133	92	54	113	1,639
5-9	167	426	358	389	315	286	231	165	212	2,549
10-14	1	60	184	186	211	231	183	165	134	1,355
15-19	0	0	34	128	191	193	195	163	154	1,058
20-24	0	0	0	8	89	141	211	176	163	788
25 +	0	0	0	0	9	100	225	307	306	947
Total	2,472	1,673	1,484	1,331	1,283	1,317	1,349	1,155	1,263	**13,327**

Pension Retirees*		
Age	Number of Retirees	Average Annual Benefit
60	20	$1,341
61	19	$1,772
62	44	$1,914
63	68	$2,057
64	88	$1,969
65	146	$2,258
66	187	$2,266
67	199	$2,273
68	223	$2,233
69	205	$2,233
70	177	$2,107
71	185	$2,248
72	195	$1,980
73	188	$2,147
74	162	$2,079
75	163	$2,082
76	160	$2,149
77	124	$2,266
78	130	$2,211
79	113	$2,199
80	131	$2,229
81	114	$2,280
82	116	$2,252
83	101	$2,269
84	95	$2,243
85	91	$2,172
86	59	$2,152
87	41	$2,207
88	46	$2,327
89	37	$2,437
90 +	85	$2,103
Total	**3,712**	**$2,177**

Includes beneficiaries of service retirees.

Line-of-Duty Death Survivors		
Age	Number of Survivors	Average Annual Benefit
<60	4	$19,853
60-74	4	19,853
75-89	3	19,853
90+	3	$19,853
Total	**14**	**$19,853**

Retirees with Disabilities		
Age	Number of Retirees	Average Annual Benefit
<60	5	$21,444
60-74	5	22,239
75-89	3	23,830
90+	0	$0
Total	**13**	**$22,300**

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 relief valuation. We assume duty related disability rates increase with age. The older the VFF relief member is, the higher the probability of duty-related disability.

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.*

- **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 Retirement*		
Age**	Rate	
	MS < 25	MS >= 25
59	0.000%	0.000%
60	3.984%	3.984%
61	1.984%	1.984%
62	10.984%	10.984%
63	6.983%	6.983%
64	4.983%	4.983%
65	41.983%	89.983%
66	19.983%	89.983%
79	19.980%	89.980%
80	100.000%	100.000%

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

*** The rates are linearly interpolated between the ages of 66 and 79.*

- **Termination Rates** - Termination rates are modeled as a function of Membership Service (MS). Rates increase at 25 years when members reach the maximum pension benefit level.

Probability of Termination*				
Service Years**	Ages 15-19	Age 20	Age 79	Age 80
0	0.000%	0.000%	0.000%	0.000%
1-4	18.000%	17.992%	17.980%	0.000%
5-9	12.000%	11.992%	11.980%	0.000%
10-14	9.000%	8.992%	8.980%	0.000%
15-24	5.000%	4.992%	4.980%	0.000%
25	13.000%	12.992%	12.980%	0.000%
26-34	9.000%	8.992%	8.980%	0.000%
35+	0.000%	0.000%	0.000%	0.000%

** The rates are linearly interpolated between the ages of 20 and 79.*

*** 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) Plan 2/3 RP-2000 Combined Healthy Mortality Table with improvements projected to the year 2031 using 50 percent of Scale AA. The Society of Actuaries published both the RP-2000 and Scale-AA tables. We developed a unisex mortality table based upon the percent male assumption described later in this section and applied it to the active and retired member population. However, we use the opposite percent male assumption when applying the mortality table to surviving spouses.

Mortality Rates															
Age	Member	Survivor	Disabled	Age	Member	Survivor	Disabled	Age	Member	Survivor	Disabled	Age	Member	Survivor	Disabled
19	0.000000	0.000000	0.000000	42	0.000942	0.000650	0.017981	65	0.008963	0.008085	0.038914	88	0.122180	0.094056	0.146579
20	0.000246	0.000160	0.015692	43	0.000991	0.000710	0.017712	66	0.010249	0.009122	0.041129	89	0.135639	0.105978	0.153440
21	0.000249	0.000158	0.015920	44	0.001046	0.000776	0.017447	67	0.011608	0.010300	0.042934	90	0.151928	0.117980	0.168502
22	0.000261	0.000160	0.016163	45	0.001109	0.000837	0.017177	68	0.012780	0.011424	0.044271	91	0.167703	0.130363	0.183262
23	0.000275	0.000165	0.016667	46	0.001180	0.000899	0.017891	69	0.014181	0.012634	0.046423	92	0.185162	0.143266	0.201346
24	0.000289	0.000171	0.017186	47	0.001246	0.000961	0.018582	70	0.015509	0.013946	0.048084	93	0.201338	0.157993	0.217257
25	0.000304	0.000177	0.017990	48	0.001319	0.001037	0.019264	71	0.017353	0.015507	0.050580	94	0.217257	0.171009	0.233086
26	0.000324	0.000188	0.019126	49	0.001395	0.001119	0.019929	72	0.019203	0.017180	0.053367	95	0.236126	0.183762	0.252247
27	0.000332	0.000195	0.019416	50	0.001478	0.001220	0.020589	73	0.021299	0.018869	0.056339	96	0.252247	0.195644	0.267622
28	0.000336	0.000202	0.019416	51	0.001564	0.001334	0.021236	74	0.023716	0.020950	0.059626	97	0.267903	0.209248	0.282818
29	0.000347	0.000212	0.019416	52	0.001765	0.001516	0.021885	75	0.026754	0.022988	0.064020	98	0.286509	0.220216	0.301451
30	0.000364	0.000229	0.019435	53	0.001925	0.001698	0.022857	76	0.029869	0.025383	0.067868	99	0.301451	0.229496	0.315397
31	0.000393	0.000250	0.019455	54	0.002110	0.001909	0.023836	77	0.033733	0.028401	0.073096	100	0.319845	0.240907	0.333847
32	0.000443	0.000290	0.019455	55	0.002350	0.002158	0.025189	78	0.038037	0.031419	0.078621	101	0.333847	0.248176	0.347249
33	0.000499	0.000327	0.019445	56	0.002707	0.002495	0.026582	79	0.042851	0.034737	0.084511	102	0.347249	0.256213	0.359966
34	0.000559	0.000363	0.019435	57	0.003183	0.002891	0.027993	80	0.048288	0.038460	0.090754	103	0.359966	0.266217	0.371340
35	0.000622	0.000395	0.019425	58	0.003610	0.003262	0.029421	81	0.054412	0.042627	0.097340	104	0.371340	0.277744	0.380708
36	0.000683	0.000427	0.019416	59	0.004063	0.003678	0.030455	82	0.061730	0.047348	0.104256	105	0.380708	0.290350	0.387409
37	0.000742	0.000457	0.019406	60	0.004582	0.004162	0.031518	83	0.069023	0.052555	0.109891	106	0.387409	0.303593	0.390781
38	0.000787	0.000484	0.019107	61	0.005269	0.004744	0.033105	84	0.077928	0.058497	0.117338	107	0.390781	0.317030	0.392273
39	0.000827	0.000513	0.018811	62	0.006008	0.005450	0.034284	85	0.086877	0.065865	0.123446	108	0.392273	0.330453	0.393744
40	0.000864	0.000552	0.018531	63	0.006946	0.006247	0.036062	86	0.096571	0.074335	0.129694	109	0.393744	0.343697	0.395154
41	0.000902	0.000597	0.018253	64	0.007955	0.007175	0.037430	87	0.108643	0.084121	0.138048	110	1.000000	1.000000	1.000000

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 amount based on membership service instead of benefit service.
- **Ratio of Survivors Selecting Annuities** – Upon the death of a terminated vested member, we assume 35 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 below. These assumptions are consistent with those selected for PERS Plan 2.

Ratio of Survivors Taking Annuities	
Age	**Rate**
39	0.000%
40	5.467%
45	9.813%
50	28.040%
55	41.919%
60	54.959%
62+	58.259%

- **Joint and Survivor Reduction Factor** – We assume a reduction factor of 0.821 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 two years younger than their spouses, consistent with PERS.

Relief Benefit Assumptions

- **Annual Cost-of-Living Adjustment (COLA)** – We assume a 3.5 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 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 60.7 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 (LTD) 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 dependent children per member. This estimate is 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 2009 OPEB Report. Based upon the self-insured nature of the VFF relief plan, we assumed the medical inflation trend is consistent with the 2009 Uniform Medical Plan (UMP) Non-Medicare rates.

Medical Inflation	
Valuation Year	**Rate**
2010	7.0%
2011-2014	6.3%
2015-2018	6.2%
2019-2022	6.1%
2023-2027	6.0%
2028-2033	5.9%
2034-2035	5.7%
2036-2037	5.6%
2038-2039	5.5%
2040-2043	5.4%
2044-2049	5.3%
2050-2056	5.2%
2057-2066	5.1%
2067+	5.0%

Miscellaneous Assumptions

- **Valuation Interest Rate** – We assumed an annual investment rate of return of 7.0 percent.
- **Percent Male** - Our current membership data does not include sufficient gender information. Thus we assume 90 percent male for the entire population consistent with the Law Enforcement Officers' and Fire Fighters' (LEOFF) Plan 2. We expect future data to include gender-based information.

Actuarial Methods

Asset Valuation Method

The asset valuation method adopted by the Board for Volunteer Fire Fighters, starting with the 2007 Volunteer Fire Fighters' and Reserve Officers' Relief and Pension Fund Actuarial Valuation (VAVR), smoothes the volatility of the contribution rates. This method provides up to eight years of smoothing for asset returns and is used in combination with the funding method (Actuarial Cost Method) described below.

The asset valuation method is an adjusted market value method. We determine the actuarial value of assets by adjusting the market value of assets to reflect the difference between the actual investment return and the expected investment return during each of the last eight years or, if fewer, the completed years since adoption, at the following annual recognition rates per year.

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.

Actuarial Cost Method

The Entry Age Normal (EAN) actuarial cost method is comprised of two components:

- Normal Cost.
- Unfunded Actuarial Accrued Liability.

We develop the pension contribution rate as the sum of the Normal Cost (NC) and an amount to amortize the Unfunded Actuarial Accrued Liability (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 Actuarial Value of Assets (AVA).

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 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. Therefore, 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 3.5 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 $82 for medical, $11 for temporary disability, and $8 for physicals. These costs are adjusted 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 in parentheses represent 2010 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 for Volunteer Fire Fighters and Reserve Officers. That amount for the 2010 calendar year was $120.
- **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 2010 calendar year was $140.
- **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. 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 x Benefit Service) x (Membership Service Factor) x (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	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
<35	10%
35	10%
36	10%
37	10%
38	11%
39	12%
40	13%
41	14%
42	15%
43	16%
44	17%
45	18%
46	20%
47	21%
48	23%
49	25%
50	27%
51	29%
52	32%
53	34%
54	37%
55	41%
56	44%
57	48%
58	52%
59	57%
60	62%
61	68%
62	75%
63	82%
64	91%
65	100%

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' (L&I) 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 $3,308.89 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 $1,654.42 per month, their spouse receives $331.38, and each dependent child receives $142.73. Disability benefits are subject to a maximum of $3,308.89 per month. Spouses will no longer be 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 $1,654.42 monthly. An additional $142.73 is paid monthly to each of the member's surviving children while they are under 18 years old. The survivor benefits are subject to a maximum of $3,308.89 per month. Duty-related death beneficiary payments to the spouse cease upon a spouse's remarriage.
- **Effective July 1, 2001** - Benefits are increased annually in line with the CPI-W – All Cities.
- **Duty Death** - A lump sum of $152,000 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

Actuarial Accrued Liability

Computed differently under different funding methods, the actuarial accrued liability generally represents the portion of the present value of fully projected benefits attributable to service credit earned (or accrued) as of the valuation date.

Actuarial Gain or Loss

A pension plan incurs actuarial gains or losses when the actual experience of the pension plan does not exactly match assumptions. For example, an actuarial gain would occur if assets earned 10 percent for a given year since the assumed interest rate in the valuation is 7 percent.

Actuarial Value of Assets (AVA)

The value of pension plan investments and other property used by the actuary for the purpose of an actuarial valuation (sometimes referred to as valuation assets). Actuaries often select an asset valuation method that smoothes the effects of short-term volatility in the market value of assets.

Entry Age Normal (EAN) Funding Method

The EAN funding method is a standard actuarial funding method. The annual cost of benefits under EAN is comprised of two components:

- Normal cost; plus
- Amortization of the unfunded actuarial accrued liability.

The EAN normal cost equals the level amount that would fund the member's projected pension benefits if collected from the member's entry to their assumed retirement.

Funded Status

The ratio of a plan's actuarial value of assets to the present value of earned pensions at the valuation date.

Normal Cost

Computed differently under different funding methods, the normal cost generally represents the portion of the cost of projected benefits allocated to the current plan year. The employer normal cost is the total normal cost of the plan reduced by employee contributions.

Present Value of Future Benefits (PVFB)

Computed by projecting the total future benefit cash flow from the plan, using actuarial assumptions (such as the probability of death or retirement), and then discounting the cash flow to the valuation date using the valuation interest rate.

Unfunded Actuarial Accrued Liability (UAAL)

The excess, if any, of the actuarial accrued liability over the actuarial value of assets. In other words, the present value of benefits earned to date not covered by current plan assets.

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