

WASHINGTON STATE Law Enforcement Officers' and Fire Fighters' Plan 2 Retirement Board



2012 Actuarial Valuation Report



Office of the State Actuary

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Report Preparation

Office of the State Actuary

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Photo Credit: Charles Middleton, "Fire Fighter Saving Girl."

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Office of the State Actuary

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**Letter of Introduction
Law Enforcement Officers' and Fire Fighters'
Retirement System Plan 2
Actuarial Valuation Report
As of June 30, 2012
October 2013**

As required under Chapter 41.45 RCW, this report documents the results of an actuarial valuation of the Law Enforcement Officers' and Fire Fighters' Retirement System Plan 2 (LEOFF 2).

The primary purpose of this valuation is to determine contribution requirements for LEOFF 2 for the plan year ending June 30, 2012, under the funding policy established by the LEOFF 2 Retirement Board. These contribution requirements are purely informational since, according to state law, this "off-cycle" valuation is not used to determine contribution rates. This valuation also provides information on the funding progress and developments in the plan over the past year.

This report is organized into the following four sections:

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

The Summary of Key Results section provides a high-level summary of the valuation results for LEOFF 2. The next two sections of the report provide detailed actuarial asset and liability information and participant data. The Appendices provide a summary of the principal actuarial assumptions and methods, a summary of the major plan provisions, and additional information used to prepare this valuation.

We encourage you to submit any questions you might have 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 (osa.leg.wa.gov), for further information regarding the actuarial funding of the Washington State retirement systems.

Sincerely,

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Summary of Key Results



Intended Use

The purpose of this report is to develop contribution rates required to fund the Law Enforcement Officers' and Fire Fighters' Retirement System (LEOFF) Plan 2 based on the funding policies described in this section. However, consistent with current law, this is not a rate-setting valuation so these results are informational only. This report provides information on the contribution rates, the funding progress, and developments in the plan over the past year. This report also discloses the data, assumptions, and methods we used to develop the contribution rates. This report is not intended to satisfy the accounting requirements under the Governmental Accounting Standards Board (GASB) rules.

Contribution Rates

The Office of the State Actuary (OSA) determined the member, employer, and state contribution rates as a percentage of salary based on the long-term funding policy adopted by the LEOFF 2 Retirement Board (the Board). The summary table to the right shows contribution rates based on the 2012 valuation along with comparable rates from the previous valuation. The **Actuarial Exhibits** section of this report shows how we developed these rates.

Contribution Rates		
	2012	2011
Member	7.74%	7.57%
Employer*	4.64%	4.54%
State	3.10%	3.03%

**Excludes administrative expense rate.*

Adopted Contribution Rates*	
Member	8.41%
Employer**	5.05%
State	3.36%

During the 2012 Interim, the Board adopted a stable contribution rate policy for 2013-17 to manage the risk of increasing contribution rates in the future. Please see the **Actuarial Certification Letter** for further details on this temporary funding policy. The table to the left shows the contribution rates adopted by the Board for 2013-17.

**Adopted for period 2013-17.*

***Excludes administrative expense rate.*

Contribution Rate-Setting Cycle

Under current Washington State law, in July of even-numbered years, the Board reviews the basic contribution rates calculated by the Board-retained actuary based on an actuarial valuation performed on asset, participant, and plan information compiled in odd-numbered years. In calculating basic contribution rates, the Board-retained actuary applies the statutory funding policies described in this section. The Board then adopts contribution rates for LEOFF Plan 2 as provided under RCW 41.26.720(1)(a). The adopted rates remain in place for the ensuing biennium, subject to revision by the Legislature.

RCW 41.45.070 requires that a temporary and supplemental contribution rate increase be charged to fund the cost of benefit enhancements enacted following the adoption of the basic rates. Supplemental contribution rates are included in the basic rates at the beginning of the next contribution rate-setting cycle.

Funding Policy

Washington State relies on systematic actuarial funding to finance the on-going cost of the state retirement systems. Under this financing approach, we reduce the cost of future pension payments by the expected long-term return on invested contributions.

The state's funding policy is found in Chapter 41.45 RCW - Actuarial Funding of State Retirement Systems. It includes the following goals to:

- ◆ Provide a dependable and systematic process for funding the benefits to members and retirees of the Washington State Retirement Systems.
- ◆ Continue to fully fund LEOFF Plan 2 as provided by law.
- ◆ Establish long-term employer contribution rates that will remain a relatively predictable proportion of the future state budgets.
- ◆ Fund, to the extent feasible, all benefits over the working lives of those members so that the taxpayers who receive the benefit of those members' service pay the cost of those benefits.

The Board adopted minimum contribution rates equal to 90 percent of the normal cost rate calculated under the Entry Age Normal (EAN) actuarial cost method.

The Washington State Investment Board (WSIB) directs the investment of retirement system contributions. RCW 43.33A.110 requires WSIB to maximize investment returns at a prudent level of risk.

Comments on 2012 Results

The following comments summarize the key changes from the last valuation.

The actual rate of investment return for the plan year was below the assumed rate of 7.5 percent. The actual, annualized investment return on the Market Value of Assets was 1.40 percent. The rate of investment return on the Actuarial Value of Assets was lower than the assumed rate of 7.5 percent.

Gains or losses to liabilities and salaries also impact contribution rates. These occur when annual economic and demographic experience differs from our long-term assumptions or when there are changes in plan provisions, actuarial assumptions, or methods. We summarize gains/losses for the total employer contribution rate below.

Overall, liabilities increased less than expected, resulting in an actuarial gain. The key reason for liability gains was that salaries increased less than expected. The key reason for liability losses comes from the increases in liabilities due to new entrants.

The present value of future salaries increased more than expected because of new members joining LEOFF Plan 2. As a result, the salary base for collecting contributions is larger. This results in an actuarial gain to the plan.

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.

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

Actuarial Liabilities

Actuarial Liabilities		
(Dollars in Millions)	2012	2011
Future Value of Fully Projected Benefits	\$65,782	\$65,000
Present Value of Fully Projected Benefits	\$9,203	\$8,720
Present Value of Accrued Benefits	\$6,071	\$5,576
Unfunded Actuarial Accrued Liability	N/A	N/A
Valuation Interest Rate	7.50%	7.50%

The table to the left summarizes key measures of actuarial liability along with the liabilities from last year's valuation. The Future Value of Fully Projected Benefits represents the total expected value of all future benefit payments for all members as of the valuation date. The Present Value of Fully Projected Benefits represents today's value of the Future Value of Fully Projected

Benefits when we discount future benefit payments with the valuation interest rate. In other words, if we invest the Present Value of Fully Projected Benefits as a lump sum amount at the valuation date and earn the valuation interest rate each year, there would be enough money to pay all future benefit payments for current members.

The Present Value of Accrued (Earned) Benefits identifies the portion of the Present Value of Future Benefits that has been "earned" as of the valuation date based on the Projected Unit Credit (PUC) actuarial cost method. The Unfunded Actuarial Accrued Liability (UAAL) represents the excess, if any, of the Present Value of Accrued Benefits at the valuation date over the Actuarial Value of Assets. In other words, the UAAL equals the present value of benefits earned at the valuation date not covered by current actuarial assets.

See the **Actuarial Exhibits** section of this report for additional information on the plan's actuarial liabilities and a disclosure of expected future benefit payments by year. Also, see the **Glossary** for brief explanations of the actuarial terms.

Plan Assets

The table to the right shows the Market Value of Assets and Actuarial (or smoothed) Value of Assets along with approximate rates of investment return.

To limit the volatility in contribution rates and funded status due to short-term market fluctuations, we smooth (or defer) the difference between actual and expected annual investment returns over a period not to exceed eight years. The Actuarial Value of Assets equals the Market Value of Assets less the Total Deferred Investment Gains and (Losses) at the valuation date. The Actuarial Value of Assets can never be less than 70 percent or greater than 130 percent of the Market Value of Assets.

Assets		
(Dollars in Millions)	2012	2011
Market Value of Assets	\$6,640	\$6,366
Actuarial Value of Assets	7,222	6,621
Contributions*	266	263
Disbursements	91	71
Investment Return	93	1,084
Other**	\$7	\$8
Rate of Return on Assets***	1.40%	21.14%

*Employee and Employer.

**Includes transfers, restorations, payables, etc.

***This is the time-weighted rate of return on the Market Value of Assets, net of expenses. The Actuarial Value of Assets is used in determining contribution rates.

See the **Actuarial Exhibits** section of this report for additional information on the plan's assets as well as the development of the Actuarial Value of Assets.

Funded Status

The funded status helps readers evaluate the health of a pension plan. A history of funded status measured consistently over a defined period helps readers evaluate a plan's funding progress over time. The funded status represents the portion of the present value of earned benefits covered by today's actuarial assets. A plan with a 100 percent funded status has one dollar in actuarial assets for each dollar of earned (or accrued) liability at the valuation date. A plan with a funded status of at least 100 percent is generally considered to be on target with its financing plan. However, a plan more/less than 100 percent funded is not automatically considered over-funded/at-risk.

We use the PUC actuarial cost method to report the funded status of the plan. The PUC method takes into account future salary and service growth for purposes of determining future benefit amounts and eligibility for those benefits, but only reflects service credit earned at the valuation date for determining earned (or accrued) benefits.

Comparing the PUC liabilities to the Actuarial Value of Assets provides an appropriate measure of a plan's funded status. Under current GASB rules, the PUC method is one of several acceptable measures of a plan's funded status. Use of another cost method could also be considered appropriate and could produce materially different results.

We did not use the PUC cost method to determine contribution requirements in this valuation. Please see the **Glossary** for a more detailed explanation of PUC.

Funded Status		
(Dollars in Millions)	2012	2011
a. Present Value of Accrued Benefits	\$6,071	\$5,576
b. Market Value of Assets	\$6,640	\$6,366
c. Deferred Gains/(Losses)	(\$581)	(\$255)
d. Actuarial Value of Assets (b-c)	\$7,222	\$6,621
e. Unfunded Liability (a-d)	(\$1,150)	(\$1,044)
f. Funded Ratio (d/a)	119%	119%

Note: Totals may not agree due to rounding.

The table to the left displays the funded status for LEOFF Plan 2. We also provide a history of funded status since 1986 and funded status under alternate assumptions and methods in the **Actuarial Exhibits** section.

Participant Data

The table to the right summarizes the participant data used in the actuarial valuation for the plan year ending June 30, 2012, along with comparable information from last year's valuation. See the **Participant Data** section of this report for additional information.

Participant Data		
	2012	2011
Active Members		
Number	16,720	16,805
Total Salaries (in millions)	\$1,560	\$1,535
Average Annual Salary	\$93,308	\$91,322
Average Attained Age	43.2	42.7
Average Service	14.3	13.8
Retirees and Beneficiaries		
Number	2,344	2,015
Average Annual Benefit	\$34,930	\$32,486
Terminated Members		
Number Vested	689	655
Number "Non-Vested"	1,558	1,617

Key Assumptions

The table to the right displays key economic assumptions used in the actuarial valuation for the plan year ending June 30, 2012. These assumptions are unchanged from our last valuation. See the **Actuarial Methods and Assumptions** in the Appendix for a detailed listing of assumptions used in this valuation.

Key Assumptions	
Valuation Interest Rate	7.50%
Salary Increase	3.75%
Inflation	3.00%
Growth in Membership*	1.25%

**Applies to the LEOFF 1 funding method only.*

Section Two

Actuarial Exhibits





Office of the State Actuary

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**Actuarial Certification Letter
Law Enforcement Officers' and Fire Fighters'
Retirement System Plan 2
Actuarial Valuation Report
As of June 30, 2012
October 2013**

This report documents the results of an actuarial valuation of the Law Enforcement Officers' and Fire Fighters' Retirement System Plan 2 (LEOFF 2) as defined under Chapter 41.26 of the Revised Code of Washington. The primary purpose of this valuation is to determine contribution requirements for the retirement plan as of the June 30, 2012, valuation date consistent with the prescribed funding policy established by the LEOFF 2 Retirement Board (the Board). These contribution requirements are purely informational since, according to state law, this "off-cycle" valuation is not used to determine contribution rates. This valuation also provides information on the funding progress and developments in the plan over the past year. This valuation report should not be used for other purposes. Please replace this report with a more recent report when available.

The valuation results summarized in this report involve calculations that require assumptions about future economic and demographic events. We believe that the assumptions and methods used in the underlying valuation are reasonable and appropriate for the primary purpose stated above. 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 assumptions used in this valuation for investment return, inflation, and salary growth were adopted by the Board in the 2011 Interim. The membership growth assumption was prescribed by the Legislature. The Board adopted updates to the demographic assumptions as part of their review of the *2001 – 2006 Experience Study* results and adoption of the associated contribution rates. Additionally, the Board adopted new disability assumptions in the 2010 Interim. See the [LEOFF 2 Disability Experience Study](#) available on the LEOFF 2 website. The Legislature was responsible for the selection of the actuarial cost and asset valuation methods. In our opinion, all methods, assumptions, and calculations are reasonable and are in conformity with generally accepted actuarial principles and standards of practice as of the date of this publication.

The Department of Retirement Systems (DRS) provided us with member and beneficiary data. We checked the data for reasonableness as appropriate based on the

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purpose of the valuation. The Washington State Investment Board (WSIB) and DRS provided financial and asset information. An audit of the financial and participant data 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 asset smoothing method adopted during the 2003 Legislative session (Chapter 11, Laws of 2003, E1) was intended to address the volatility of contribution rates under the aggregate funding method when used in combination with the existing asset allocation policy of WSIB. The combination of the current asset smoothing method with any other funding method or asset allocation policy may not be appropriate.

During the 2012 Interim, the Board adopted a stable contribution rate policy for 2013-17 to manage the risk of increasing contribution rates in the future. This temporary funding policy produces contribution rates, at June 30, 2011, that exceed the requirements under the plan's actuarial cost method and long-term funding policy. In our opinion, this temporary funding policy is reasonable and consistent with the Board's risk management goals. The adoption of contribution rates below the current stable rates for 2013-17 could also be reasonable, but potentially inconsistent with the Board's risk management goals.

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
Senior Actuary

Contribution Rates

Member and Employer Rate Summary		
	2012	2011
Member	7.74%	7.57%
Employer*	4.64%	4.54%
State (Normal Cost)	3.10%	3.03%
State (Plan 1 UAAL)	0.00%	0.00%
Total State	3.10%	3.03%

*Excludes administrative expense rate.

Development of Employer/State Rates	
	LEOFF 2
a. Total Normal Cost	15.48%
b. Employee Normal Cost (a x 50%)	7.74%
c. Total Employer/State Normal Cost (a - b)	7.74%
d. State Normal Cost (a x 20%)	3.10%
e. Employer Normal Cost (c - d)*	4.64%
f. Cost to Amortize UAAL	0.00%
g. Total Employer Contribution Rate (e + f)**	4.64%

*Excludes administrative expense rate.

**The state pays 20% of the total normal cost for LEOFF 2. This reduces the total employer contribution rate from 7.74% to 4.64%.

The tables on the following page show the development of the normal cost rates. Consistent with the Law Enforcement Officers' and Fire Fighters' (LEOFF) Plan 2 Retirement Board's (the Board) funding policy, the normal cost rates include minimum contribution rates to provide stable and adequate contribution rates over time. The minimum rates are 90 percent of the normal cost calculated under the Entry Age Normal (EAN) funding method. Please see the **Glossary** for a more detailed explanation of EAN.

Development of Normal Cost Rates		
(Dollars in Millions)		LEOFF 2
1. Calculation of Member Normal Cost Rate		
a.	Future Value of Fully Projected Benefits	\$65,782
b.	Present Value of Fully Projected Benefits	9,202
c.	Valuation Assets	7,222
d.	Unfunded Fully Projected Benefits (b - c)	1,980
e.	Plan 1 Present Value of Future Salaries (PVS)	N/A
f.	Plan 2 PVS	16,768
g.	Weighted PVS (2e + 2f)	\$33,535
h.	Employee Normal Cost (d / g)	5.90%
i.	Employee Minimum Contribution Rate	7.74%
j.	Employee Contribution Rate with Minimum	7.74%
k.	Change In Plan Provisions (Laws of 2013)	0.00%
l.	Employee Contribution Rate (j + k)	7.74%
2. Calculation of Employer/State Normal Cost Rate		
a.	Present Value of Fully Projected Benefits	\$9,202
b.	Valuation Assets	7,222
c.	Unfunded Fully Projected Benefits (a - b)	1,980
d.	Present Value of Employee Contributions	990
e.	Employer/State Responsibility (c - d)	\$990
f.	Plan 2 PVS	\$16,768
g.	Employer/State Normal Cost (e / f)	5.90%
h.	Employer/State Minimum Contribution Rate	7.74%
i.	Employer/State Contribution Rate with Minimum	7.74%
j.	Change In Plan Provisions (Laws of 2013)	0.00%
k.	Total Employer/State Contribution Rate (i + j)	7.74%
3. Contribution Rates Adopted for 2013-17*		
a.	Employee Contribution Rate**	8.41%
b.	Employer Contribution Rate (a - c)**	5.05%
c.	State Contribution Rate**	3.36%
d.	Total Contribution Rate (a + b + c)	16.82%

Note: Totals may not agree due to rounding.

*LEOFF 2 rates adopted by the LEOFF 2 Board.

**LEOFF 2 rate: 50% Employee, 30% Employer, 20% State.

Amortization of the Plan 1 Unfunded Actuarial Accrued Liability (UAAL)		
(Dollars in Millions)		LEOFF 1
a.	Future Value of Fully Projected Benefits	\$10,001
b.	Present Value of Fully Projected Benefits (PVFB)	4,132
c.	Valuation Assets	5,562
d.	Actuarial Present Value of Future Normal Costs	0
e.	UAAL (b - c - d)	(1,429)
f.	Expected UAAL Contributions to 2013	0
g.	Remaining UAAL (e - f)	(\$1,429)
h.	Amortization Date	6/30/2024
i.	Present Value of Projected Salaries beyond 2013	\$12,019
j.	Preliminary Contribution Rate (g/ i)*	(11.89%)
k.	Change In Plan Provisions (Laws of 2013)	0.00%
l.	Contribution Rate to Amortize the UAAL (j + k)*	(11.89%)

Note: Totals may not agree due to rounding.

*No LEOFF 1 UAAL contributions are required when the plan is fully funded under current funding methods and assumptions.

Actuarial Liabilities

Present Value of Fully Projected Benefits	
(Dollars in Millions)	LEOFF 2
Active Members	
Retirement	\$7,043
Termination	88
Death	65
Disability	406
Return of Contributions on Termination	82
Return of Contributions on Death	88
Total Active	\$7,774
Inactive Members	
Terminated	\$140
Service Retired	1,141
Disability Retired	89
Survivors	57
Total Inactive	\$1,428
Laws of 2013	1
2012 Total	\$9,203
2011 Total	\$8,720

Note: Totals may not agree due to rounding.

Present Value of Accrued (Earned) Benefits*	
(Dollars in Millions)	LEOFF 2
Active Members	
Retirement	\$4,183
Termination	53
Death	47
Disability	260
Return of Contributions on Termination	48
Return of Contributions on Death	52
Total Active	\$4,643
Inactive Members	
Terminated	\$140
Service Retired	1141
Disability Retired	89
Survivors	57
Total Inactive	\$1,428
Laws of 2013	1
2012 Total	\$6,071
2011 Total	\$5,576

Note: Totals may not agree due to rounding.

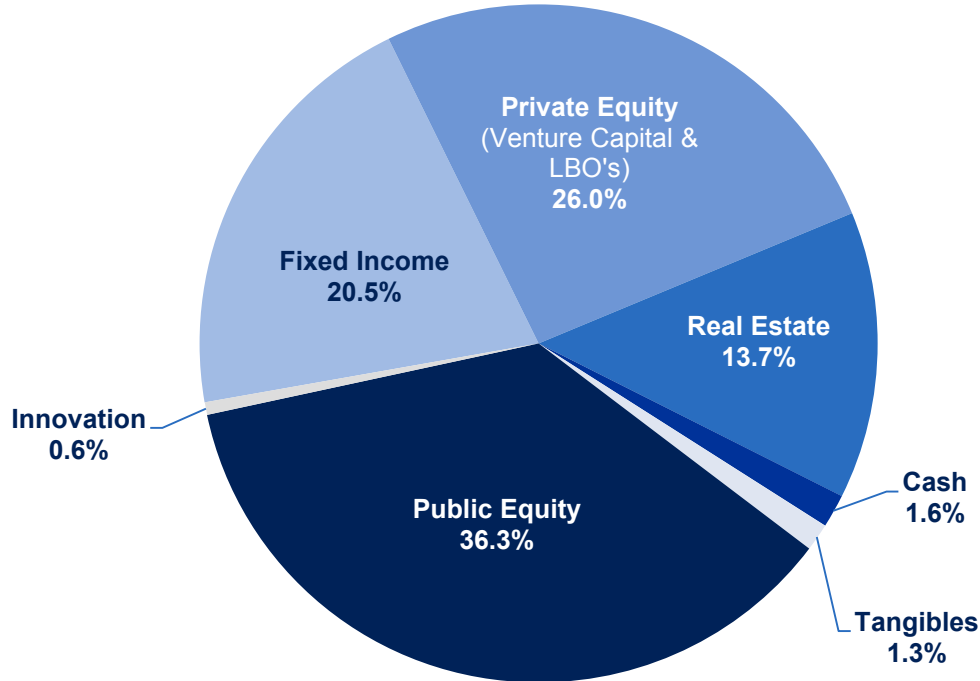
*Calculated using the PUC cost method.

This method was not used to determine contribution requirements.

Fully Projected Benefit Payments					
LEOFF - Plan 2					
(Dollars in Millions)	Future Value	Present Value	Year	Future Value	Present Value
2012	\$116	\$112	2062	\$978	\$25
2013	145	130	2063	904	22
2014	178	149	2064	830	19
2015	214	166	2065	758	16
2016	253	183	2066	687	13
2017	295	198	2067	619	11
2018	338	211	2068	553	9
2019	384	223	2069	489	8
2020	434	235	2070	430	6
2021	486	244	2071	374	5
2022	540	253	2072	321	4
2023	599	261	2073	273	3
2024	662	268	2074	230	3
2025	727	274	2075	191	2
2026	794	278	2076	156	1
2027	861	281	2077	126	1
2028	932	283	2078	101	1
2029	1,006	284	2079	79	1
2030	1,078	283	2080	61	0
2031	1,150	281	2081	46	0
2032	1,223	278	2082	35	0
2033	1,294	273	2083	26	0
2034	1,364	268	2084	19	0
2035	1,432	262	2085	13	0
2036	1,495	254	2086	9	0
2037	1,555	246	2087	7	0
2038	1,610	237	2088	4	0
2039	1,660	227	2089	3	0
2040	1,706	217	2090	2	0
2041	1,740	206	2091	1	0
2042	1,767	195	2092	1	0
2043	1,787	183	2093	1	0
2044	1,799	172	2094	0	0
2045	1,804	160	2095	0	0
2046	1,799	148	2096	0	0
2047	1,786	137	2097	0	0
2048	1,766	126	2098	0	0
2049	1,740	116	2099	0	0
2050	1,708	106	2100	0	0
2051	1,669	96	2101	0	0
2052	1,624	87	2102	0	0
2053	1,574	78	2103	0	0
2054	1,520	70	2104	0	0
2055	1,462	63	2105	0	0
2056	1,400	56	2106	0	0
2057	1,335	50	2107	0	0
2058	1,267	44	2108	0	0
2059	1,197	39	2109	0	0
2060	1,125	34	2110	0	0
2061	\$1,051	\$29	2111	\$0	\$0
			Total	\$65,782	\$9,203

Plan Assets

Retirement Commingled Trust Fund (CTF) Asset Allocation



Cash: Highly liquid, very safe investments that can be easily converted into cash, such as Treasury Bills and money-market funds.

Fixed Income: Securities representing debt obligations and usually having fixed payments and maturities. Different types of fixed income securities include government and corporate bonds, mortgage-backed securities, asset-backed securities, convertible issues, and may also include money-market instruments.

Innovation: Fund that provides the ability to invest in a broad range of assets that fall outside the traditional asset classes or management style of existing asset classes.

Public Equity: Shares of U.S. and non-U.S. corporations that trade on public exchanges or “over-the-counter.” The ownership of a corporation is represented by shares that are claimed on the corporation’s earnings and assets.

Private Equity: The infusion of equity capital into a private company (one that is not available on the public markets). Private equity investments include securities that are not listed on a public exchange and are not easily accessible to most individuals. These investments range from initial capital in start-up enterprises to leveraged buyouts of mature corporations.

Real Estate: An externally-managed selection of partnership investments with the majority of the partnerships invested in high-quality real estate leased to third parties.

Tangibles: The tangible asset portfolio invests in sectors such as infrastructure, timber, agriculture, natural resources, commodities, or other sectors consistent with the goals of the asset class.

Section 2: Actuarial Exhibits

Change in Market Value of Assets	
(Dollars in Millions)	LEOFF 2
2011 Market Value	\$6,366
Revenue	
Contributions	
Employee	133
Employer/State	133
Total Contributions	266
Investment Return	93
Restorations	7
Transfers In	0
Miscellaneous	0
Total Revenue	\$365
Disbursements	
Monthly Benefits	78
Refunds	11
Total Benefits	89
Transfers Out	0
Expenses	1
Total Disbursements	\$91
Payables	\$0
2012 Market Value	\$6,640
2012 Actuarial Value	\$7,222
Ratio (AV/MV)	109%

Note: Totals may not agree due to rounding.

Calculation of Actuarial Value of Assets			
(Dollars in Millions)			LEOFF 2
a.	Market Value at 6/30/2012		\$6,640
b.	Deferred Gains and (Losses)		
Plan Year Ending		Years Deferred	Years Remaining
	6/30/2012	7	6
	6/30/2011	8	6
	6/30/2010	5	2
	6/30/2009	8	4
	6/30/2008	8	3
	6/30/2007	8	2
	9/30/2006	8	1
	Total Deferral		(\$581)
c.	Market Value less Deferral (a - b)		\$7,222
d.	70% of Market Value of Assets		\$4,648
e.	130% of Market Value of Assets		\$8,633
f.	Actuarial Value of Assets*		\$7,222

Note: Totals may not agree due to rounding.

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

Investment Gains and (Losses) for Prior Year	
(Dollars in Millions)	LEOFF 2
a. 2011 Market Value (at WSIB)	\$6,349
b. Total Cash Flow	177
c. 2012 Market Value (at WSIB)	6,620
d. Actual Return (c - b - a)	\$94
e. Weighted Asset Amount	\$6,442
f. Expected Return (7.5% x e)	483
g. Investment Gain/(Loss) for Prior Year (d - f)	(390)
h. Dollar-Weighted Rate of Return	1.45%

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 the present value of earned pensions of its members. A plan's funded status can vary significantly, depending on the assumptions and methods used to determine the value of the plan's assets and liabilities. For this valuation report, we present two funded status measures.

The first funded status measure compares the Actuarial Value of Assets (AVA) to the Projected Unit Credit (PUC) liabilities calculated using a long-term interest assumption. The second measure compares the Market Value of Assets (MVA) to the PUC liabilities calculated using a short-term interest assumption. The next sections describe these measures in more detail and display the resulting funded status for the plan. Please see the **Glossary** for an explanation of the PUC actuarial cost method.

We include information for LEOFF Plan 1 because the prior funding policy required the state to amortize any LEOFF 1 Unfunded Actuarial Accrued Liability (UAAL) not later than June 30, 2024, using projected salaries of both LEOFF 1 and LEOFF 2 members.

Funded Status on an Actuarial Value Basis

We report the funded status on an actuarial value basis as the ratio of the AVA to the PUC liability calculated using the 7.50 percent valuation interest rate assumption. We assume the plan is on-going and, therefore, we use the same long-term assumptions to develop the liabilities as we used for determining the contribution requirements of the plan. We don't expect the assumptions to match actual experience over short-term periods. However, we do expect these assumptions to reasonably approximate average annual experience over long-term periods. This measure of funded status is consistent with the state's current funding policy and financing plan for future retirement benefits.

We use an asset valuation method to determine the AVA. This asset valuation method smooths the inherent volatility in the MVA by deferring a portion of annual investment gains or losses for a certain number of years. Investment gains and losses occur when the annual return on investments varies from the long-term assumed rate of 7.5 percent. The AVA provides a more stable measure of the plan's assets on an on-going basis.

We use the PUC actuarial cost method to determine the present value of earned pensions. The PUC liabilities are actuarial liabilities based on members' earned service credit as of the valuation date. They include future assumed salary increases and reflect future service credits for determining benefit

eligibility. The PUC 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.

Comparing the PUC liabilities to the AVA provides an appropriate measure of a plan's funded status. Under current Governmental Accounting Standards Board (GASB) rules, the PUC method is one of several acceptable measures of a plan's funded status. Use of another cost method could also be considered appropriate and could produce materially different results. A plan with a funded status under this measurement of at least 100 percent is generally considered to be on target with its financing plan. However, a plan more/less than 100 percent funded is not automatically considered over-funded/at-risk.

The table below displays the funded status on an actuarial value basis for LEOFF.

Funded Status on an Actuarial Value Basis*			
(Dollars in Millions)		LEOFF 2	LEOFF 1
PUC Liability		\$6,071	\$4,121
Valuation Assets		\$7,222	\$5,562
Unfunded Liability		(\$1,150)	(\$1,440)
Funded Ratio			
	2012	119%	135%
	2011	119%	135%
	2010 **	119%	127%
	2009 **	128%	125%
	2008 **	133%	128%
	2007 **	129%	123%
	2006 **	116%	117%
	2005 **	114%	114%
	2004	117%	109%
	2003	125%	112%
	2002	137%	119%
	2001 **	154%	129%
	2000 **	161%	136%
	1999	154%	125%
	1998	160%	117%
	1997 **	155%	108%
	1996	130%	89%
	1995	126%	80%
	1994 **	124%	68%
	1993	127%	68%
	1992	128%	65%
	1991	154%	66%
	1990	153%	65%
	1989 **	158%	65%
	1988	153%	66%
	1987	157%	69%
	1986	142%	57%

Note: Totals may not agree due to rounding. See the 2012 AVR for development of LEOFF 1 values.

**Liabilities valued using the PUC cost method at an interest rate of 7.5% for LEOFF 2, 7.9% for LEOFF 1. All assets have been valued under the actuarial asset method.*

***Assumptions changed.*

The present value of actuarial liabilities is sensitive to the interest rate assumption. The following tables show how the funded status changes when we use different interest rate assumptions. We calculated liabilities using varying interest rates to show this sensitivity.

Funded Status at a 1% Lower Interest Rate Assumption*		
(Dollars in Millions)	LEOFF 2	LEOFF 1
PUC Liability	\$7,207	\$4,498
Valuation Assets	\$7,222	\$5,562
Unfunded Liability	(\$15)	(\$1,064)
Funded Ratio		
2012	100%	124%
2011	100%	123%
2010	99%	116%
2009	107%	114%
2008	111%	117%
2007	107%	111%

Note: Totals may not agree due to rounding. See the 2012 AVR for development of LEOFF 1 values.

*Liabilities valued using the PUC cost method at an interest rate of 6.5% for LEOFF 2, 6.9% for LEOFF 1. All assets have been valued under the actuarial asset method.

Funded Status at a 1% Higher Interest Rate Assumption*		
(Dollars in Millions)	LEOFF 2	LEOFF 1
PUC Liability	\$5,177	\$3,797
Valuation Assets	\$7,222	\$5,562
Unfunded Liability	(\$2,045)	(\$1,764)
Funded Ratio		
2012	140%	146%
2011	140%	146%
2010	141%	139%
2009	152%	137%
2008	159%	141%
2007	154%	135%

Note: Totals may not agree due to rounding. See the 2012 AVR for development of LEOFF 1 values.

*Liabilities valued using the PUC cost method at an interest rate of 8.5% for LEOFF 2, 8.9% for LEOFF 1. All assets have been valued under the actuarial asset method.

Funded Status on a Market Value Basis

We report the funded status on a market value basis as the ratio of the MVA to the PUC liability calculated using a 5 percent interest rate assumption. The funded status on a market value basis provides a measure of the plan's health if the plan is "settled" or "immunized" on the valuation date. Immunizing a pension plan means attaching assets to liabilities so the assets maturing each year match the expected pension payments due from the pension plan each year. A plan can be settled by purchasing annuities on the open market for each member, or immunized by investing the assets in bonds with payment streams that match the expected benefit payments. Expected benefit payments would include growth for future salary inflation, which is why we have used the PUC liability measure instead of a purely accrued liability measure.

Because LEOFF 2 is open and on-going, we only present the market value funded status for the closed LEOFF 1. Although LEOFF 1 is closed to new members, it is not settled and has not been immunized. However, there is an opportunity to immunize the plan in the future. LEOFF 1 is considered an on-going plan because current annuitants continue to receive their benefits from the retirement trust fund, and current active members continue to accrue benefits under the plan. However, because the plan is closed to new members, the future benefit payments are more predictable, have a shorter duration, and would be easier to immunize. The decision to settle or immunize LEOFF 1 is complex and would require additional actuarial analysis and information that is outside the scope of this report.

The following table displays the market value funded status for LEOFF 1 as described above.

Funded Status on a Market Value Basis*		
(Dollars in Millions)		LEOFF 1
Projected Unit Credit Liability		\$5,400
Market Value of Assets		\$4,903
Unfunded Liability		\$497
Funded Ratio		
	2012	91%
	2011	95%
	2010	82%
	2009	76%
	2008	107%
	2007	114%
	2006	102%
	2005	94%
	2004	82%

Note: Totals may not agree due to rounding.

*Liabilities have been valued using an interest rate of 5% while assets are their market value. The 5% interest rate approximates the "risk-free" rate of return on assets while maintaining consistency with the 3% inflation assumption used to project future benefit payments. This method was not used to determine contribution requirements. Prior to 2011, liabilities were valued at 5.5%.

Both funded status measures vary based on the measurement (valuation) date and the market conditions on that date. The market value measure, however, is more volatile because the asset value has no smoothing and the ability to immunize the plan depends on current bond and annuity purchase rates.

Actuarial Gains/Losses

The next three tables display actuarial gains and losses, expressed as contribution rate changes. Actuaries use gain/loss analysis to compare actual changes to assumed changes in assets, liabilities, and salaries from various sources. We also use this analysis to determine:

- ◆ The accuracy of our valuation model and annual processing.
- ◆ Why contribution rates changed.
- ◆ The reasonableness of the actuarial assumptions.

Actuarial gains will reduce contribution rates; actuarial losses will increase contribution rates. Under a reasonable set of actuarial assumptions, actuarial gains and losses will offset over long-term experience periods.

Change in State Contribution Rate by Source*	
Change in Employer Rate	LEOFF
2011 Contribution Rate Before Laws of 2012	(6.46%)
Remove Rate Floor / Ceiling	(0.55%)
LEOFF 1 Funding Method Changes	(2.12%)
2011 Adjusted Contribution Rate	(9.13%)
Liability Gains/Losses	0.07%
Asset Gains/Losses	0.69%
Present Value of Future Salaries Gains/Losses	(0.45%)
Incremental Changes	(0.39%)
Other Gains/Losses	(0.32%)
Total Change	(0.40%)
2012 Preliminary Contribution Rate	(9.53%)
Increase from Applied Rate Floor	0.74%
Laws of 2013	0.00%
2012 Adjusted Contribution Rate	(8.79%)

*The LEOFF contribution rate is the State's portion for Plan 2 (20% of the Normal Cost) plus the UAAL rate for Plan 1.

Change in Normal Cost by Source*	
Change in Normal Costs	LEOFF 2
2011 Normal Cost Before Laws of 2012	3.03%
Remove Rate Floor / Ceiling	(0.55%)
2011 Adjusted Normal Cost Rate	2.48%
Liabilities	
Salaries	(0.22%)
Termination	(0.01%)
Retirement	(0.01%)
Growth / Return to Work	0.13%
Other Liabilities	0.04%
Total Liability Gains/Losses	(0.07%)
Asset Gains/Losses	0.01%
Present Value of Future Salaries Gains/Losses	(0.03%)
Incremental Changes	
Plan Change	0.00%
Method Change	0.00%
Assumption Change	0.00%
Correction Change	0.00%
Total Incremental Changes Gains/Losses	0.00%
Other Gains/Losses	(0.03%)
Total Change	(0.12%)
2012 Preliminary Normal Cost	2.36%
Increase from Applied Rate Floor	0.74%
Laws of 2013	0.00%
2012 Adjusted Normal Cost	3.10%

*The LEOFF 2 contribution rate is the State's portion for Plan 2 (20% of the Normal Cost) .

Change in State UAAL Rate by Source*	
Change in UAAL Rate	LEOFF 1
2011 UAAL Rate Before Laws of 2012	(9.49%)
Remove Rate Floor / Ceiling	0.00%
Remove Plan 1 Benefit Improvements After 2009	N/A
LEOFF 1 Roll Forward Funding Method	(2.12%)
2011 Adjusted UAAL Rate	(11.61%)
Liabilities	
Salaries	(0.03%)
Termination	0.00%
Retirement	(0.01%)
Return to Work	0.00%
Inflation (CPI)	0.05%
Other Liabilities	0.13%
Total Liability Gains/Losses	0.14%
Asset Gains/Losses	0.68%
Present Value of Future Salaries Gains/Losses	(0.42%)
Incremental Changes	
Plan Change	0.00%
Method Change	(0.32%)
Assumption Change	0.00%
Correction Change	(0.07%)
Total Incremental Changes Gains/Losses	(0.39%)
Other Gains/Losses	(0.29%)
Total Change	(0.28%)
2012 Preliminary UAAL Rate	(11.89%)
Laws of 2013	0.00%
2012 Adjusted UAAL Rate	(11.89%)

*The contribution rate is the UAAL rate for plan 1. No contributions are required under current law when the plan remains fully funded.

Effect of Plan, Assumption, and Method Changes

In addition to experience gains or losses, changes in plan provisions or actuarial assumptions or methods can also impact contribution rates.

Plan Changes

- ◆ None.

Assumption Changes

- ◆ None.

Method Changes

- ◆ We now spread the EAN cost as a level percentage of pay over a member's career, rather than over the period from entry to the last decrement age where each benefit is available.
- ◆ For the entry age used in the EAN calculation, the member's career begins with their age at entry into the current plan, rather than the age they entered service in any state plan.

Effect of Changes on the Current Valuation

The following table shows the effect of the above changes on the current actuarial valuation report results.

Effect of Plan, Assumption, and Method Changes	
Before Changes	LEOFF 2
PVFB	\$9,214
PUC Liability	6,070
Actuarial Value of Assets	7,222
Unfunded Liability	(1,152)
Employer Contribution Rate*	4.62%
After Changes	
PVFB	\$9,203
PUC Liability	6,071
Actuarial Value of Assets	7,222
Unfunded Liability	(1,150)
Employer Contribution Rate*	4.64%
Increase/(Decrease) in Rate	0.02%

Before and after changes include actuarial gains and losses for the year ending 6/30/2012.

Both before and after contribution rates include rate minimums.

**The contribution rate is the Employer's portion only (30% of the Plan 2 Normal Cost).*

Section Three

Participant Data



Overview of System Membership

Law Enforcement Officers' and Fire Fighters' (LEOFF) Retirement System Plan 2 (Chapter 41.26 RCW).

Membership includes fire fighters; emergency medical technicians; law enforcement officers including sheriffs; university, port, and city police officers; and Department of Fish and Wildlife enforcement officers.

Active Membership By Employer	
State Agencies	127
Higher Education	104
Community Colleges	0
K-12	0
Counties	2,738
County Sub Divisions	211
First Class Cities	4,948
Other Cities	4,934
Ports	178
Education Service District	0
Fire Districts	3,480
Public Utility District	0
Water Districts	0
Energy Northwest	0
Unions	0
TOTAL	16,720

The following table summarizes participant data changes from last year's valuation to this year's valuation. We divide the participant data into two main categories.

- ♦ **Actives** – members accruing benefits in the plan.
- ♦ **Annuitants** – members and beneficiaries receiving benefits from the plan.

Reconciliation of Participant Data	
2011 Actives	16,805
Transfers	0
Hires/Rehires	510
New Retirees	(300)
Deaths	(9)
Terminations	(286)
2012 Actives	16,720
2011 Annuitants	2,015
New Retirees	336
Annuitant Deaths	(23)
New Survivors	19
Other	(3)
2012 Annuitants	2,344
Ratio of Actives to Annuitants	7.13

Summary of Plan Participants

Summary of Plan Participants		
	2012	2011
Active Members		
Number	16,720	16,805
Total Salaries (Millions)	\$1,560	\$1,535
Average Age	43.2	42.7
Average Service	14.3	13.8
Average Salary	\$93,308	\$91,322
Terminated Members		
Number Vested	689	655
Number "Non-Vested"	1,558	1,617
Retirees		
Number of Retirees (All)	2,344	2,015
Average Monthly Benefit, All Retirees	\$2,911	\$2,707
Number of New "Service Retirees"	323	317
Average Monthly Benefit, New "Service Retirees"	\$3,970	\$3,716

Section Four

Appendices



Actuarial Methods and Assumptions

To calculate the contribution rates necessary to pre-fund the plan's benefits, an actuary uses an actuarial cost method, asset valuation method, economic assumptions, and demographic assumptions.

Actuarial Cost Methods

The future benefit obligations (or costs of the plan) are spread over the working lifetimes of the plan members based on the actuarial cost method (or funding method) in place for the plan. This produces a future stream of contributions to pre-fund the plan's benefits. Different cost methods pre-fund plans at different rates. Some put more money in earlier whereas others put more money in later.

Actuarial cost methods generally have two parts, which serve to:

- ◆ Fund future benefits in a consistent manner from year to year.
- ◆ Make up for any shortfalls in prior funding, including differences in funding when experience differs from assumptions.

The two parts of an actuarial cost method are:

- ◆ **The Normal Cost** — the value of future benefits allocated to the current plan year under the actuarial cost method.
- ◆ **Amortization of the Unfunded Actuarial Accrued Liability (UAAL)** — where the UAAL represents the amount of past service liability that exceeds the value of the plan's assets.

The Legislature was responsible for the selection of the actuarial cost and asset valuation methods. The actuarial cost methods used for the Law Enforcement Officers' and Fire Fighters' (LEOFF) Retirement System are as follows.

LEOFF Plan 1: A variation of the Frozen Initial Liability Cost Method is used to determine the normal cost and the actuarial accrued liability for retirement, termination, and ancillary benefits. Under this method, the UAAL is equal to the unfunded actuarial present value of projected benefits less the actuarial present value of future normal costs for all active members and is reset at each valuation date. The present value of future normal costs is based on the Aggregate normal cost rate for Plan 2 and the resulting UAAL is amortized by June 30, 2024, as a level percentage of projected system payroll. The projected payroll includes pay from Plan 2 as well as projected payroll from future new entrants.

LEOFF Plan 2: We use the Aggregate Cost Method to determine the normal cost and the actuarial accrued liability. Under this method, the unfunded actuarial present value of fully projected benefits is amortized over the future payroll of the active group. Members pay 50 percent of the total normal cost. The entire contribution is considered normal cost and no UAAL exists.

We use the Projected Unit Credit (PUC) cost method to report the plan's funded status. The PUC cost method projects future benefits under the plan, using salary growth and other assumptions, and applies the service that has been earned as of the valuation date to determine accrued liabilities. Comparing the PUC liabilities to the actuarial value of assets on the valuation date provides an appropriate measure of a plan's funded status. Under current Governmental Accounting Standards Board (GASB) rules, the PUC method is one of several acceptable measures of a plan's funded status. Use of another cost method could also be considered appropriate and could produce materially different results. Please see the **Glossary** for a further explanation of the PUC cost method.

Section 4: Appendices

We use the plan's assets to calculate contribution rates, unfunded liabilities, and the plan's funded status. Because the market value of assets can be volatile from one year to the next, an asset valuation method is generally used to adjust the Market Value of Assets (MVA) and smooth the effects of short-term volatility. The adjusted assets are called the Actuarial Value of Assets (AVA), or valuation assets.

For this valuation, we calculate the AVA using an asset smoothing method. This smoothing method was adopted during the 2003 Legislative Session. Each year, beginning with the application of this smoothing method, we determine the amount the actual investment return exceeds (or falls below) the expected investment return and we smooth that year's gain (or loss) based on the scale in the table on the right.

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.

Annual Gain/Loss		
Rate of Return	Smoothing Period	Annual Recognition
14.5% and up	8 years	12.50%
13.5-14.5%	7 years	14.29%
12.5-13.5%	6 years	16.67%
11.5-12.5%	5 years	20.00%
10.5-11.5%	4 years	25.00%
9.5-10.5%	3 years	33.33%
8.5-9.5%	2 years	50.00%
6.5-8.5%	1 year	100.00%
5.5-6.5%	2 years	50.00%
4.5-5.5%	3 years	33.33%
3.5-4.5%	4 years	25.00%
2.5-3.5%	5 years	20.00%
1.5-2.5%	6 years	16.67%
0.5-1.5%	7 years	14.29%
0.5% and lower	8 years	12.50%

Economic Assumptions

Economic Assumptions	
Annual Growth in Membership	1.25%
Interest on Member Contributions ¹	5.50%
Return on Investment Earnings ²	7.50%
Inflation ³	3.00%
General Salary Increases (includes inflation) ⁴	3.75%
Annual COLA ⁵	3.00%

¹Annual rate, compounded quarterly.

²Annual rate, compounded annually, net of expenses

³Based on the CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.

⁴Excludes longevity, merit or step increases that usually apply to members in the early part of their careers.

⁵Based on the CPI (3% maximum per year).

These generally include the annual rate of return on plan assets, annual rate of inflation, and annual rate of salary growth. The economic assumptions used in this actuarial valuation are prescribed by the Legislature and the LEOFF Plan 2 Retirement Board, and are shown in the table to the left.

Demographic Assumptions

These include rates of retirement, rates at which members become disabled, turnover rates, mortality rates, and several other demographic assumptions as disclosed later in this section.

Changes in Methods and Assumptions since the Last Valuation

We changed the methods we use to value Entry Age Normal (EAN) liabilities in the following ways:

- ◆ We now spread the Entry Age Normal (EAN) cost as a level percentage of pay over a member's career, rather than over the period from entry to the last decrement age where each benefit is available.
- ◆ For the entry age used in the EAN calculation, the member's career begins with their age at entry into the current plan, rather than the age they entered service in any state plan.

Our mortality rates include an assumption for future mortality improvements. We took three distinct steps to build our mortality assumptions. First, we applied mortality improvements to the RP-2000 mortality table using 50 percent of Scale AA to 2003, the midpoint of our latest experience study period. Next, we developed age offsets for each system and plan. Finally, we projected the mortality rates into the future, also using 50 percent of Scale AA, to reflect continued mortality improvements.

When age offsets are negative, it means we think people of a given age are generally healthier than others their age. In other words, we expect their mortality experience will be similar to others who are younger than they are. Conversely, a positive age offset means we expect mortality experience for a given age to match that of a higher age in the general population. For instance, we expect a 50-year-old LEOFF male to have the same mortality rate as other 49-year-old males because we assume a negative one-year age offset.

As an example, consider a healthy LEOFF Plan 2 male, age 50. To project the RP-2000 mortality rates to 2003, we use the following equation.

$$\text{RP-2000 rate} \times (1 - 50\% \text{ Scale AA})^3$$

For a 50-year-old male, this is $0.002138 \times (1 - 0.0090)^3 = 0.002081$. Now we have the so-called "RP-2003" rate. However, we expect the age 50 member to have the experience of a 49-year-old. The corresponding age 49 male rate for RP-2003 is 0.001945. As a last step, we complete the projection of mortality improvements to the given year (2034 for LEOFF Plan 2). This gives a final mortality rate of 0.001469 for a LEOFF Plan 2 male.

The tables on the following pages show RP-2000 and 50 percent of Scale AA, both published by the Society of Actuaries. The tables that follow show the age offsets we used, the year to which we projected mortality improvements, and the resulting projected mortality rates for each plan. Please see the *2001-2006 Experience Study* for more details regarding the development of these rates.

Section 4: Appendices

RP-2000 Mortality Rates			50% Scale AA		
Combined Healthy Table					
Age	Male	Female	Age	Male	Female
20	0.000345	0.000191	20	0.0095	0.0080
21	0.000357	0.000192	21	0.0090	0.0085
22	0.000366	0.000194	22	0.0085	0.0085
23	0.000373	0.000197	23	0.0075	0.0080
24	0.000376	0.000201	24	0.0065	0.0075
25	0.000376	0.000207	25	0.0050	0.0070
26	0.000378	0.000214	26	0.0030	0.0060
27	0.000382	0.000223	27	0.0025	0.0060
28	0.000393	0.000235	28	0.0025	0.0060
29	0.000412	0.000248	29	0.0025	0.0060
30	0.000444	0.000264	30	0.0025	0.0050
31	0.000499	0.000307	31	0.0025	0.0040
32	0.000562	0.000350	32	0.0025	0.0040
33	0.000631	0.000394	33	0.0025	0.0045
34	0.000702	0.000435	34	0.0025	0.0050
35	0.000773	0.000475	35	0.0025	0.0055
36	0.000841	0.000514	36	0.0025	0.0060
37	0.000904	0.000554	37	0.0025	0.0065
38	0.000964	0.000598	38	0.0030	0.0070
39	0.001021	0.000648	39	0.0035	0.0075
40	0.001079	0.000706	40	0.0040	0.0075
41	0.001142	0.000774	41	0.0045	0.0075
42	0.001215	0.000852	42	0.0050	0.0075
43	0.001299	0.000937	43	0.0055	0.0075
44	0.001397	0.001029	44	0.0060	0.0075
45	0.001508	0.001124	45	0.0065	0.0080
46	0.001616	0.001223	46	0.0070	0.0085
47	0.001734	0.001326	47	0.0075	0.0090
48	0.001860	0.001434	48	0.0080	0.0090
49	0.001995	0.001550	49	0.0085	0.0090
50	0.002138	0.001676	50	0.0090	0.0085
51	0.002449	0.001852	51	0.0095	0.0080
52	0.002667	0.002018	52	0.0100	0.0070
53	0.002916	0.002207	53	0.0100	0.0060
54	0.003196	0.002424	54	0.0100	0.0050
55	0.003624	0.002717	55	0.0095	0.0040
56	0.004200	0.003090	56	0.0090	0.0030
57	0.004693	0.003478	57	0.0085	0.0025
58	0.005273	0.003923	58	0.0080	0.0025
59	0.005945	0.004441	59	0.0080	0.0025
60	0.006747	0.005055	60	0.0080	0.0025
61	0.007676	0.005814	61	0.0075	0.0025
62	0.008757	0.006657	62	0.0075	0.0025
63	0.010012	0.007648	63	0.0070	0.0025
64	0.011280	0.008619	64	0.0070	0.0025

RP-2000 Mortality Rates			50% Scale AA		
Combined Healthy Table					
Age	Male	Female	Age	Male	Female
65	0.012737	0.009706	65	0.0070	0.0025
66	0.014409	0.010954	66	0.0065	0.0025
67	0.016075	0.012163	67	0.0065	0.0025
68	0.017871	0.013445	68	0.0070	0.0025
69	0.019802	0.014860	69	0.0070	0.0025
70	0.022206	0.016742	70	0.0075	0.0025
71	0.024570	0.018579	71	0.0075	0.0030
72	0.027281	0.020665	72	0.0075	0.0030
73	0.030387	0.022970	73	0.0075	0.0035
74	0.033900	0.025458	74	0.0075	0.0035
75	0.037834	0.028106	75	0.0070	0.0040
76	0.042169	0.030966	76	0.0070	0.0040
77	0.046906	0.034105	77	0.0065	0.0035
78	0.052123	0.037595	78	0.0060	0.0035
79	0.057927	0.041506	79	0.0055	0.0035
80	0.064368	0.045879	80	0.0050	0.0035
81	0.072041	0.050780	81	0.0045	0.0035
82	0.080486	0.056294	82	0.0040	0.0035
83	0.089718	0.062506	83	0.0040	0.0035
84	0.099779	0.069517	84	0.0035	0.0035
85	0.110757	0.077446	85	0.0035	0.0030
86	0.122797	0.086376	86	0.0035	0.0025
87	0.136043	0.096337	87	0.0030	0.0020
88	0.150590	0.107303	88	0.0025	0.0020
89	0.166420	0.119154	89	0.0025	0.0015
90	0.183408	0.131682	90	0.0020	0.0015
91	0.199769	0.144604	91	0.0020	0.0015
92	0.216605	0.157618	92	0.0015	0.0015
93	0.233662	0.170433	93	0.0015	0.0010
94	0.250693	0.182799	94	0.0015	0.0010
95	0.267491	0.194509	95	0.0010	0.0010
96	0.283905	0.205379	96	0.0010	0.0010
97	0.299852	0.215240	97	0.0010	0.0005
98	0.315296	0.223947	98	0.0005	0.0005
99	0.330207	0.231387	99	0.0005	0.0005
100	0.344556	0.237467	100	0.0005	0.0005
101	0.358628	0.244834	101	0.0000	0.0000
102	0.371685	0.254498	102	0.0000	0.0000
103	0.383040	0.266044	103	0.0000	0.0000
104	0.392003	0.279055	104	0.0000	0.0000
105	0.397886	0.293116	105	0.0000	0.0000
106	0.400000	0.307811	106	0.0000	0.0000
107	0.400000	0.322725	107	0.0000	0.0000
108	0.400000	0.337441	108	0.0000	0.0000
109	0.400000	0.351544	109	0.0000	0.0000
110	0.400000	0.364617	110	0.0000	0.0000

Scale AA represents annual improvements in mortality rates.

Projected Mortality Assumptions					Projected Disabled Mortality Assumptions				
LEOFF					LEOFF				
Plan 1 - 2019		Plan 2 - 2034			Plan 1 - 2019		Plan 2 - 2034		
Offsets	-1	1	-1	1	2	2	0	0	
Age	Male	Female	Male	Female	Male	Female	Male	Female	Age
20	0.000288	0.000165	0.000249	0.000146	0.000306	0.000166	0.016316	0.005670	20
21	0.000290	0.000165	0.000253	0.000145	0.000316	0.000168	0.016598	0.005573	21
22	0.000303	0.000168	0.000267	0.000148	0.000322	0.000171	0.016885	0.005573	22
23	0.000316	0.000173	0.000282	0.000153	0.000328	0.000178	0.017474	0.005670	23
24	0.000329	0.000180	0.000298	0.000160	0.000337	0.000186	0.018082	0.005768	24
25	0.000340	0.000188	0.000316	0.000169	0.000350	0.000196	0.019034	0.005867	25
26	0.000353	0.000199	0.000337	0.000182	0.000372	0.000210	0.020379	0.006071	26
27	0.000360	0.000210	0.000347	0.000192	0.000393	0.000221	0.020730	0.006071	27
28	0.000364	0.000221	0.000351	0.000202	0.000423	0.000236	0.020730	0.006071	28
29	0.000375	0.000236	0.000361	0.000216	0.000476	0.000275	0.020730	0.006071	29
30	0.000393	0.000280	0.000378	0.000260	0.000536	0.000319	0.020730	0.006283	30
31	0.000423	0.000324	0.000408	0.000305	0.000602	0.000365	0.020730	0.006501	31
32	0.000476	0.000365	0.000458	0.000343	0.000669	0.000402	0.020730	0.006501	32
33	0.000536	0.000399	0.000516	0.000373	0.000737	0.000435	0.020730	0.006391	33
34	0.000602	0.000431	0.000580	0.000400	0.000802	0.000466	0.020730	0.006283	34
35	0.000669	0.000462	0.000645	0.000425	0.000862	0.000497	0.020730	0.006176	35
36	0.000737	0.000493	0.000710	0.000451	0.000918	0.000532	0.020730	0.006071	36
37	0.000802	0.000528	0.000772	0.000478	0.000971	0.000571	0.020730	0.005968	37
38	0.000855	0.000566	0.000817	0.000510	0.001016	0.000617	0.020379	0.005867	38
39	0.000903	0.000612	0.000857	0.000547	0.001065	0.000671	0.020035	0.005768	39
40	0.000948	0.000671	0.000892	0.000599	0.001123	0.000738	0.019696	0.005768	40
41	0.000992	0.000738	0.000927	0.000660	0.001189	0.000812	0.019362	0.005768	41
42	0.001040	0.000812	0.000965	0.000725	0.001266	0.000892	0.019034	0.005768	42
43	0.001096	0.000892	0.001009	0.000797	0.001354	0.000973	0.018712	0.005768	43
44	0.001160	0.000973	0.001060	0.000869	0.001437	0.001057	0.018394	0.005768	44
45	0.001236	0.001048	0.001121	0.000929	0.001527	0.001135	0.018082	0.005670	45
46	0.001322	0.001126	0.001189	0.000990	0.001623	0.001217	0.018781	0.006122	46
47	0.001403	0.001208	0.001253	0.001055	0.001724	0.001305	0.019450	0.006588	47
48	0.001491	0.001305	0.001322	0.001140	0.001830	0.001414	0.020094	0.007188	48
49	0.001584	0.001414	0.001394	0.001234	0.002076	0.001564	0.020712	0.007820	49
50	0.001683	0.001577	0.001469	0.001388	0.002239	0.001724	0.021307	0.008629	50
51	0.001786	0.001738	0.001548	0.001540	0.002429	0.001906	0.021879	0.009495	51
52	0.002026	0.001937	0.001743	0.001743	0.002640	0.002134	0.022427	0.010597	52
53	0.002203	0.002169	0.001895	0.001981	0.002999	0.002438	0.023348	0.011788	53
54	0.002409	0.002478	0.002072	0.002298	0.003480	0.002826	0.024267	0.013069	54
55	0.002662	0.002872	0.002307	0.002704	0.003926	0.003238	0.025619	0.014436	55
56	0.003047	0.003290	0.002661	0.003145	0.004454	0.003711	0.027012	0.015889	56
57	0.003566	0.003741	0.003137	0.003603	0.005063	0.004235	0.028447	0.017132	57
58	0.004023	0.004235	0.003566	0.004079	0.005792	0.004820	0.029934	0.018102	58
59	0.004527	0.004820	0.004013	0.004643	0.006600	0.005544	0.030949	0.019074	59
60	0.005104	0.005544	0.004524	0.005340	0.007529	0.006348	0.031995	0.020057	60
61	0.005839	0.006348	0.005215	0.006114	0.008691	0.007293	0.033656	0.021065	61
62	0.006653	0.007293	0.005943	0.007024	0.009791	0.008219	0.034823	0.022115	62
63	0.007651	0.008219	0.006886	0.007916	0.011146	0.009255	0.036687	0.023229	63
64	0.008761	0.009255	0.007885	0.008914	0.012628	0.010445	0.038044	0.024430	64

Projected Mortality Assumptions (Continued)					Projected Disabled Mortality Assumptions (Continued)				
LEOFF					LEOFF				
Plan 1 - 2019		Plan 2 - 2034			Plan 1 - 2019		Plan 2 - 2034		
Offsets	-1	1	-1	1	2	2	0	0	
Age	Male	Female	Male	Female	Male	Female	Male	Female	Age
65	0.009871	0.010445	0.008883	0.010060	0.014088	0.011598	0.039514	0.025739	65
66	0.011236	0.011598	0.010189	0.011171	0.015765	0.012821	0.041830	0.027180	66
67	0.012730	0.012821	0.011544	0.012348	0.017468	0.014170	0.043622	0.028769	67
68	0.014088	0.014170	0.012679	0.013648	0.019402	0.015964	0.044818	0.030523	68
69	0.015638	0.015964	0.014074	0.015376	0.021468	0.017689	0.046948	0.032452	69
70	0.017189	0.017689	0.015353	0.017038	0.023645	0.019676	0.048450	0.034565	70
71	0.019246	0.019518	0.017191	0.018658	0.026337	0.021663	0.050972	0.036242	71
72	0.021295	0.021663	0.019021	0.020708	0.029382	0.024009	0.053731	0.038690	72
73	0.023645	0.023817	0.021120	0.022597	0.032841	0.026255	0.056741	0.040626	73
74	0.026337	0.026255	0.023525	0.024910	0.036604	0.028927	0.060008	0.043400	74
75	0.029620	0.028695	0.026657	0.027021	0.041107	0.031652	0.064631	0.045576	75
76	0.033107	0.031652	0.029796	0.029805	0.045748	0.034891	0.068478	0.048671	76
77	0.037199	0.035172	0.033732	0.033370	0.051331	0.038831	0.073824	0.052853	77
78	0.041775	0.038831	0.038169	0.036842	0.057587	0.042922	0.079573	0.056404	78
79	0.046867	0.042922	0.043146	0.040723	0.065070	0.047507	0.085714	0.060175	79
80	0.052585	0.047507	0.048777	0.045073	0.073395	0.052666	0.092234	0.064186	80
81	0.058993	0.052666	0.055134	0.049968	0.082474	0.058478	0.099118	0.068467	81
82	0.066658	0.058478	0.062769	0.055482	0.092602	0.065037	0.106350	0.073050	82
83	0.074584	0.065037	0.070232	0.061705	0.102790	0.072564	0.111993	0.077967	83
84	0.083810	0.072564	0.079516	0.068846	0.114883	0.081053	0.119761	0.083254	84
85	0.093349	0.081706	0.088566	0.078106	0.127467	0.091266	0.125690	0.090472	85
86	0.103619	0.092001	0.098310	0.088610	0.141310	0.102473	0.131700	0.098361	86
87	0.115809	0.103298	0.110706	0.100242	0.157422	0.114879	0.140160	0.106977	87
88	0.129529	0.114879	0.124756	0.111481	0.175153	0.126958	0.148954	0.114405	88
89	0.143596	0.127979	0.138304	0.125130	0.190777	0.140538	0.155426	0.124455	89
90	0.159968	0.140538	0.155235	0.137409	0.208834	0.153186	0.171339	0.133080	90
91	0.176563	0.153186	0.171339	0.149775	0.225279	0.165890	0.186624	0.142249	91
92	0.193860	0.165890	0.189544	0.162196	0.243644	0.177926	0.205827	0.151967	92
93	0.210514	0.179357	0.205827	0.176685	0.260360	0.190846	0.222036	0.164733	93
94	0.227092	0.190846	0.222036	0.188004	0.276337	0.201512	0.238219	0.176685	94
95	0.245603	0.201512	0.241945	0.198510	0.294206	0.211504	0.258545	0.188004	95
96	0.262454	0.211504	0.258545	0.208354	0.309824	0.220060	0.274410	0.198510	96
97	0.278559	0.221829	0.274410	0.220171	0.324476	0.229199	0.289823	0.211611	97
98	0.296571	0.229199	0.294354	0.227486	0.341810	0.235574	0.309980	0.220171	98
99	0.312314	0.235574	0.309980	0.233814	0.355770	0.242883	0.324640	0.227486	99
100	0.329712	0.244834	0.329712	0.244834	0.371685	0.254498	0.344556	0.237467	100
101	0.344556	0.254498	0.344556	0.254498	0.383040	0.266044	0.358628	0.244834	101
102	0.358628	0.266044	0.358628	0.266044	0.392003	0.279055	0.371685	0.254498	102
103	0.371685	0.279055	0.371685	0.279055	0.397886	0.293116	0.383040	0.266044	103
104	0.383040	0.293116	0.383040	0.293116	0.400000	0.307811	0.392003	0.279055	104
105	0.392003	0.307811	0.392003	0.307811	0.400000	0.322725	0.397886	0.293116	105
106	0.397886	0.322725	0.397886	0.322725	0.400000	0.337441	0.400000	0.307811	106
107	0.400000	0.337441	0.400000	0.337441	0.400000	0.351544	0.400000	0.322725	107
108	0.400000	0.351544	0.400000	0.351544	0.400000	0.351544	0.400000	0.337441	108
109	0.400000	0.351544	0.400000	0.351544	0.400000	0.351544	0.400000	0.351544	109
110	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	110

Improvements in mortality are projected to the year specified for each plan based on 50% of Scale AA.

Service Retirement			Disablement*		Ratio of Survivors Selecting Annuities**		Age
LEOFF 1		LEOFF 2	LEOFF 1		LEOFF 1	LEOFF 2	
Male & Female	Male & Female	Male & Female	Male & Female	Male & Female	Male & Female	Male & Female	
20	0.00	0.00	0.0010	0.0001	0.00	0.00	20
21	0.00	0.00	0.0010	0.0002	0.00	0.00	21
22	0.00	0.00	0.0010	0.0002	0.00	0.00	22
23	0.00	0.00	0.0010	0.0002	0.00	0.00	23
24	0.00	0.00	0.0010	0.0003	0.00	0.00	24
25	0.00	0.00	0.0010	0.0003	0.00	0.00	25
26	0.00	0.00	0.0024	0.0004	0.00	0.00	26
27	0.00	0.00	0.0038	0.0005	0.00	0.00	27
28	0.00	0.00	0.0052	0.0005	0.00	0.00	28
29	0.00	0.00	0.0066	0.0007	0.00	0.00	29
30	0.00	0.00	0.0080	0.0008	0.00	0.00	30
31	0.00	0.00	0.0094	0.0009	0.00	0.00	31
32	0.00	0.00	0.0107	0.0010	0.00	0.00	32
33	0.00	0.00	0.0121	0.0011	0.00	0.00	33
34	0.00	0.00	0.0135	0.0012	0.00	0.00	34
35	0.00	0.00	0.0149	0.0013	0.00	0.07	35
36	0.00	0.00	0.0163	0.0015	0.00	0.07	36
37	0.00	0.00	0.0190	0.0018	0.00	0.07	37
38	0.00	0.00	0.0205	0.0020	0.00	0.07	38
39	0.00	0.00	0.0220	0.0021	0.00	0.07	39
40	0.00	0.00	0.0235	0.0023	0.57	0.17	40
41	0.00	0.00	0.0249	0.0024	0.57	0.17	41
42	0.00	0.00	0.0264	0.0025	0.57	0.17	42
43	0.00	0.00	0.0279	0.0027	0.57	0.17	43
44	0.00	0.00	0.0360	0.0028	0.57	0.17	44
45	0.00	0.00	0.0400	0.0030	0.57	0.27	45
46	0.00	0.00	0.0468	0.0033	0.57	0.27	46
47	0.00	0.00	0.0532	0.0038	0.57	0.27	47
48	0.00	0.00	0.0592	0.0044	0.57	0.27	48
49	0.00	0.00	0.0648	0.0049	0.57	0.27	49

Rates have been rounded for display purposes.

*LEOFF disability retirements are assumed to continue after service retirement eligibility, except for LEOFF 1 members with more than 30 years of service.

Please see the 2012 AVR for full LEOFF 1 assumptions.

**Refers to survivor who selects annuity payments (rather than a lump sum payment) upon active or terminated vested member's death. The LEOFF 2 ratio is 0.607 for duty-related deaths.

Service Retirement			Disablement*		Ratio of Survivors Selecting Annuities**		Age
LEOFF 1		LEOFF 2	LEOFF 1		LEOFF 1	LEOFF 2	
Male & Female	Male & Female	Male & Female	Male & Female	Male & Female	Male & Female	Male & Female	
20	0.00	0.00	0.0010	0.0001	0.00	0.00	20
21	0.00	0.00	0.0010	0.0002	0.00	0.00	21
22	0.00	0.00	0.0010	0.0002	0.00	0.00	22
23	0.00	0.00	0.0010	0.0002	0.00	0.00	23
24	0.00	0.00	0.0010	0.0003	0.00	0.00	24
25	0.00	0.00	0.0010	0.0003	0.00	0.00	25
26	0.00	0.00	0.0024	0.0004	0.00	0.00	26
27	0.00	0.00	0.0038	0.0005	0.00	0.00	27
28	0.00	0.00	0.0052	0.0005	0.00	0.00	28
29	0.00	0.00	0.0066	0.0007	0.00	0.00	29
30	0.00	0.00	0.0080	0.0008	0.00	0.00	30
31	0.00	0.00	0.0094	0.0009	0.00	0.00	31
32	0.00	0.00	0.0107	0.0010	0.00	0.00	32
33	0.00	0.00	0.0121	0.0011	0.00	0.00	33
34	0.00	0.00	0.0135	0.0012	0.00	0.00	34
35	0.00	0.00	0.0149	0.0013	0.00	0.07	35
36	0.00	0.00	0.0163	0.0015	0.00	0.07	36
37	0.00	0.00	0.0190	0.0018	0.00	0.07	37
38	0.00	0.00	0.0205	0.0020	0.00	0.07	38
39	0.00	0.00	0.0220	0.0021	0.00	0.07	39
40	0.00	0.00	0.0235	0.0023	0.57	0.17	40
41	0.00	0.00	0.0249	0.0024	0.57	0.17	41
42	0.00	0.00	0.0264	0.0025	0.57	0.17	42
43	0.00	0.00	0.0279	0.0027	0.57	0.17	43
44	0.00	0.00	0.0360	0.0028	0.57	0.17	44
45	0.00	0.00	0.0400	0.0030	0.57	0.27	45
46	0.00	0.00	0.0468	0.0033	0.57	0.27	46
47	0.00	0.00	0.0532	0.0038	0.57	0.27	47
48	0.00	0.00	0.0592	0.0044	0.57	0.27	48
49	0.00	0.00	0.0648	0.0049	0.57	0.27	49

Rates have been rounded for display purposes.

*LEOFF disability retirements are assumed to continue after service retirement eligibility, except for LEOFF 1 members with more than 30 years of service.

Please see the 2012 AVR for full LEOFF 1 assumptions.

**Refers to survivor who selects annuity payments (rather than a lump sum payment) upon active or terminated vested member's death. The LEOFF 2 ratio is 0.607 for duty-related deaths.

Termination			Percent Vested*		Step Salary Increases		
Service Years	LEOFF 1	LEOFF 2	LEOFF 1	LEOFF 2	LEOFF		Service Years
	Male & Female	Male & Female	Male & Female	Male & Female	% Increase	Salary Ratio	
0	0.1072	0.1070	0.00	0.00	11.00%	1.840	0
1	0.0482	0.0481	0.00	0.00	11.00%	1.657	1
2	0.0246	0.0245	0.00	0.00	7.70%	1.493	2
3	0.0217	0.0216	0.00	0.00	6.10%	1.386	3
4	0.0206	0.0204	0.00	0.00	4.00%	1.307	4
5	0.0198	0.0197	1.00	0.24	2.80%	1.256	5
6	0.0194	0.0193	1.00	0.24	2.00%	1.222	6
7	0.0193	0.0192	1.00	0.24	1.60%	1.198	7
8	0.0180	0.0179	1.00	0.24	1.50%	1.179	8
9	0.0175	0.0174	1.00	0.24	1.40%	1.162	9
10	0.0172	0.0170	1.00	0.24	1.70%	1.146	10
11	0.0153	0.0151	1.00	0.24	1.30%	1.127	11
12	0.0151	0.0150	1.00	0.24	1.30%	1.112	12
13	0.0145	0.0144	1.00	0.27	1.30%	1.098	13
14	0.0116	0.0114	1.00	0.27	1.30%	1.084	14
15	0.0108	0.0107	1.00	0.27	1.30%	1.070	15
16	0.0106	0.0105	1.00	0.27	1.10%	1.056	16
17	0.0085	0.0084	1.00	0.33	1.10%	1.045	17
18	0.0087	0.0086	1.00	0.44	1.10%	1.033	18
19	0.0086	0.0085	1.00	0.44	1.10%	1.022	19
20	0.0088	0.0087	1.00	0.69	1.10%	1.011	20
21	0.0085	0.0084	1.00	0.82	0.00%	1.000	21
22	0.0082	0.0081	1.00	0.88	0.00%	1.000	22
23	0.0076	0.0075	1.00	0.91	0.00%	1.000	23
24	0.0072	0.0071	1.00	0.91	0.00%	1.000	24

Rates have been rounded for display purposes.

**Denotes ratio of members who do not withdraw their savings when they leave employment.*

Termination			Percent Vested*		Step Salary Increases		
(Continued)			(Continued)		(Continued)		
LEOFF 1 LEOFF 2			LEOFF 1	LEOFF 2	LEOFF		
Service Years	Male & Female	Male & Female	Male & Female	Male & Female	% Increase	Salary Ratio	Service Years
25	0.0067	0.0066	1.00	0.91	0.00%	1.000	25
26	0.0077	0.0076	1.00	0.91	0.00%	1.000	26
27	0.0070	0.0069	1.00	0.91	0.00%	1.000	27
28	0.0062	0.0061	1.00	0.91	0.00%	1.000	28
29	0.0018	0.0017	1.00	0.91	0.00%	1.000	29
30	0.0016	0.0015	1.00	0.91	0.00%	1.000	30
31	0.0016	0.0015	1.00	0.91	0.00%	1.000	31
32	0.0016	0.0015	1.00	0.91	0.00%	1.000	32
33	0.0016	0.0015	1.00	0.91	0.00%	1.000	33
34	0.0016	0.0015	1.00	0.91	0.00%	1.000	34
35	0.0016	0.0015	1.00	0.91	0.00%	1.000	35
36	0.0016	0.0015	1.00	0.91	0.00%	1.000	36
37	0.0016	0.0015	1.00	0.91	0.00%	1.000	37
38	0.0016	0.0015	1.00	0.91	0.00%	1.000	38
39	0.0016	0.0015	1.00	0.91	0.00%	1.000	39
40	0.0016	0.0015	1.00	0.91	0.00%	1.000	40
41	0.0016	0.0015	1.00	0.91	0.00%	1.000	41
42	0.0016	0.0015	1.00	0.91	0.00%	1.000	42
43	0.0016	0.0015	1.00	0.91	0.00%	1.000	43
44	0.0016	0.0015	1.00	0.91	0.00%	1.000	44
45	0.0016	0.0015	1.00	0.91	0.00%	1.000	45
46	0.0016	0.0015	1.00	0.91	0.00%	1.000	46
47	0.0016	0.0015	1.00	0.91	0.00%	1.000	47
48	0.0016	0.0015	1.00	0.91	0.00%	1.000	48
49	0.0016	0.0015	1.00	0.91	0.00%	1.000	49
50	0.0016	0.0015	1.00	0.91	0.00%	1.000	50

Rates have been rounded for display purposes.

*Denotes ratio of members who do not withdraw their savings when they leave employment.

Early Retirement Factors		
Years Early	LEOFF 2*	Subsidized 3%**
0	1.000	1.00
1	0.910	0.97
2	0.830	0.94
3	0.757	0.91
4	0.691	N/A
5	0.631	N/A
6	0.577	N/A
7	0.527	N/A
8	0.483	N/A
9	0.442	N/A
10	0.405	N/A
11	0.371	N/A
12	0.341	N/A
13	0.313	N/A
14	0.287	N/A
15	0.264	N/A
16	0.242	N/A
17	0.223	N/A
18	0.205	N/A
19	0.188	N/A
20	0.173	N/A
21	0.159	N/A
22	0.147	N/A
23	0.135	N/A
24	0.125	N/A
25	0.115	N/A
26	0.106	N/A
27	0.100	N/A
28	0.100	N/A
29	0.100	N/A
30+	0.100	N/A

From Normal Retirement Age.

**Only applies to non-duty disabilities and deaths.*

***LEOFF 2 members must be at least age 50 with 20 or more years of service to qualify.*

Section 4: Appendices

Certain and Life Annuities: Years Certain	
LEOFF 1	3
LEOFF 2	5

Member/Beneficiary Age Difference (In Years)		
	Male Member	Female Member
LEOFF	3	(2)

Age difference is Member age minus Beneficiary age.

Assumed Retirement Age from Inactive Status	
LEOFF 2	53 (50 if service >= 20 years)

LEOFF 2 Duty-Related Disability Assumption	
Age	Duty Disability Rate*
20	97.15%
25	95.71%
30	94.30%
35	92.85%
40	91.45%
50	85.75%
55+	82.90%

*Probability of disability being duty-related; geometrically interpolated between given values. Applies to LEOFF 2 only. Table represents a summary of rates.

Duty-Related Death Assumption	
	Duty Death Rate*
LEOFF 1	0.0376%
LEOFF 2	0.0376%

*The duty death rate is a constant probability, regardless of age. The nonduty death rate is obtained by subtracting duty death rate from mortality rate for any given age. We increase these rates by 10% for a death resulting in payment of the special lump sum duty-death benefit.

Additional Duty-Related Assumptions for LEOFF 2	
Percent of disabilities assumed to be catastrophic	12%
Percent of deaths assumed to be caused by occupational diseases for fire fighters	
Age	Rate
20-49	14.74%
50-69	27.39%
Percent of Final Average Salary paid for catastrophic disability benefits (including offset adjustments).	33.86%

Average Ratio of Survivors of Inactive Deaths Selecting Annuities*	
LEOFF 2	26%

*Refers to survivor who selects annuity payments (rather than a lump sum payment) if a currently terminated vested member dies before retirement age.

Joint and 100 Percent Survivor Option Factors*		
	Male Members	Female Members
LEOFF 2	0.866	0.891

*Applied to on-going survivor benefits in the event of a non-duty, pre-retirement death. Based on our member/beneficiary age difference assumptions and the option factors in WAC 415-02-380. Reductions apply to non-duty death benefits only.

Employee Contribution Rates for Savings Fund Accrual	
LEOFF 2	8.46%

This assumption helps us estimate the value of accumulated employee contributions with interest if a member elects a refund of contributions instead of a deferred retirement allowance upon termination.

*No LEOFF 1 rates are required as long as the plan remains fully funded.

Medical Premium Reimbursement

RCW 41.26.510(5) states that qualified survivors and children of line-of-duty deaths (Survivors) in LEOFF 2 shall have medical premiums reimbursed from the retirement fund. The law also provides that all survivors will be covered by the Public Employees Benefits Board (PEBB).

RCW 41.26.470(10) states that LEOFF 2 members with total disabilities (Disabilities) and qualified family members shall have medical premiums reimbursed from the retirement fund.

The costs for these benefits are included in the results presented in this report. However, the benefits are funded through irrevocable trust funds, known as 401(h) accounts, from contribution rates selected by the Department of Retirement Systems (DRS) and the LEOFF 2 Board. These contribution rates are “carved out” of the total adopted contribution rates. DRS and the LEOFF 2 Board will periodically review the funding requirements for these benefits and adjust the 401(h) contribution rates as necessary.

The information below represents methods and assumptions tied directly to the medical premium reimbursement benefits. Please see the [2011 Other Post-Employment Benefits Actuarial Valuation Report](#) (OPEB Report) for the assumptions referenced below.

Medical Inflation

- ◆ **Current and Future Survivors, and Future Disabilities:** Uniform Medical Plan (UMP) Medicare and Pre-Medicare assumptions (OPEB report).
- ◆ **Current Disabilities:** 5 percent per year.

Percent Married

- ◆ **Future Disabilities:** 85 percent.
- ◆ **Current Disabilities:** 100 percent.

Percent With Children

- ◆ **Disabilities and Survivors:** 100 percent, one child each.

Premium Percentages

When the data for members currently qualifying for total disability benefits does not provide information about how many family members are covered, we use the assumptions in the table at the right to split the total premium into each family member’s share.

Premium Percentages (Current Disabilities)	
Family Member	Percent of Total Premium
Primary	34%
Spouse	49%
Child	17%
All	100%

Assumed Coverage Type, Future Disabilities

- ◆ Fifty percent covered by policies provided under the Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA).
- ◆ Fifty percent covered by employer-provided policies.

Assumed Premiums

Disabilities (Used for Future Disabilities and Current Disabilities Who Have Missing Values)			
Coverage Type	Family Member	Category	Annual Premium
COBRA			
	Member	Pre-Medicare	\$10,376.62
	Spouse	Pre-Medicare	5,807.57
	Child	Pre-Medicare	\$3,058.40
Employer			
	Member	Pre-Medicare	\$12,895.81
		Medicare	7,854.30
	Spouse	Pre-Medicare	11,457.78
		Medicare	7,392.38
	Child	Pre-Medicare	\$3,962.35
Total Disabilities			
State-Provided Medicare Subsidy			
	Age	Annual Subsidy	
	Less than 25	\$6,472.80	
	25-27	4,084.80	
	28 and Above	\$1,156.80	
Future Survivors (Covered under PEBB Options)			
Family Member	Category	Annual Premium Medical	Dental
Survivor			
	Pre-Medicare	\$6,115.56	\$571.56
	Medicare	\$2,329.56	\$571.56
Child			
	Pre-Medicare	\$4,530.48	\$571.56

Assumed Timing/Length of Coverage

Assumed Timing/Length of Coverage			
Coverage Type	Beneficiary Type	Start of Coverage	End of Coverage
COBRA			
	Future Disabilities	Upon Benefit Commencement	2.5 Years after Commencement*
	Current Disabilities	Upon Benefit Commencement	29 Months after Commencement
Employer/PEBB			
	Survivors and Spouses of Disabilities	Upon Benefit Commencement	Age 65**
	Disabilities	Upon Benefit Commencement	29 Months after Commencement
	Child	Upon Benefit Commencement	10 Years after Commencement**
Medicare			
	Future Disabilities	2.5 Years after Commencement*	Paid for Life
	Current Disabilities	29 Months after Commencement	Paid for Life
	Survivors and Spouses of Disabilities	Age 65**	Paid for Life**
State-Provided Medicare Subsidy***			
	Current and Future Disabilities	29 Months After Commencement	Paid for Life

*Because of a limitation in the model, we assume 2 years for 50% of members, and 3 years for 50% of members, depending on member's age at benefit commencement.

**Benefits paid to spouses and child(ren) of Disabilities for the life of the member.

***Whether member is covered by COBRA or other means, we assume the member is also covered under the state's explicit Medicare subsidy.

Miscellaneous Assumptions/Methods

We include the following miscellaneous assumptions and methods in this valuation:

- ◆ Minimum and maximum allowable ages are set in the data as follows.

	Non-Annuitants	Annuitants
Minimum Age	16	20
Maximum Age	80	110

- ◆ Default entry salaries, usually increased for past service, are assigned for active members with less than two months' service during the valuation year.
- ◆ Historical salaries for vested terminated members are not provided in the valuation data. Beginning with the 2008 valuation year, we first look to see if we kept a historical salary for such a member in the prior year's data. If so, we copy the salary to the current year's data. If a member was active in the prior year and terminated in the current year, we copy the prior year's salary to the current year's salary and keep it as historical.
- ◆ Additionally, in 2009 we searched our data for actual salaries up to ten years prior for terminated vested members who did not already have historical salaries listed. To estimate salaries for the remaining terminated vested members, we use the following procedure: First, a salary appropriate for LEOFF 2 and the member's total past service is assigned. These salaries are determined as of a given base year. Second, the salary is divided by

the general salary increase assumption for each year the member has been inactive as measured from the base year.

- ◆ While DRS reports salaries earned during the year prior to the valuation date, the salaries used in the first year of the valuation process have received an additional merit salary increase. In other words, the valuation software projects salaries to the coming year, beginning the day after the valuation date.
- ◆ LEOFF 2 uses a midyear decrement timing assumption.
- ◆ Members who receive a disability benefit are not assumed to return to active duty in the future.
- ◆ Termination rates are discontinued after members are eligible to retire.

Summary of Plan Provisions

The table to the right presents a high-level summary of the plan provisions and is not meant to contain an exhaustive list. For complete details of plan provisions, please refer to the statute shown in the table or contact the plan administrator, the Department of Retirement Systems. In the unlikely event that information contained in this table conflicts with state law, the law takes precedence.

Summary of Plan Provisions	
Effective Date of Plan	10/1/77
Date Closed to New Entrants	Open
Statutory Reference	Chapter 41.26 RCW
Normal Retirement Eligibility (age/service)	53/5
Accrued Benefit Formula	2% x YOS x AFC; 0.25% per month pre-retirement COLA with 20 years of service
Computation of FAS/AFC	Average compensation earnable for the highest 60 consecutive months
Credited Service	Monthly, based on hours worked each month
Vesting	5 years
Vested Benefits Upon Termination	Refund of employee contributions (x 150% if 10 YOS) plus interest, or deferred retirement allowance
Early Retirement Eligibility (age/service)	50/20
Early Retirement Reduction Factors	3% ERF with 20 YOS
Disability Retirement Benefit	Non-duty: accrued benefit, actuarially reduced; Duty, occupational: accrued benefit without actuarial reduction, minimum 10% of AFC; Duty, total: 70% of AFC with offsets for Social Security and L&I benefits, not to exceed 100% of AFC.
COLA	Lesser of CPI* or 3%
Minimum Benefit per Month per YOS	n/a
Changes in Plan Provisions Since Last Valuation	Health Insurance Reimbursement (C 287 L 13)
*CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.	

Age/Service Distribution

Age and Service Distribution of Active Law Enforcement Officers (Number of Actives and Average Annual Salary)														
Attained Age	LEOFF Plan 2													
	Attained Years of Service													
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Total
Under 25	13	17	7	0	0	0	0	0	0	0	0	0	0	37
	\$59,207	\$59,837	\$59,122	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$59,480
25-29	36	60	64	77	143	176	0	0	0	0	0	0	0	556
	\$56,214	\$57,554	\$67,877	\$73,092	\$77,310	\$80,754	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$73,232
30-34	29	48	61	76	144	647	96	1	0	0	0	0	0	1,102
	\$60,320	\$63,296	\$72,794	\$75,326	\$78,754	\$84,594	\$87,086	*	\$0	\$0	\$0	\$0	\$0	\$81,198
35-39	12	29	27	42	84	511	616	122	0	0	0	0	0	1,443
	\$60,171	\$63,708	\$71,028	\$78,752	\$78,608	\$82,466	\$90,376	\$93,843	\$0	\$0	\$0	\$0	\$0	\$85,696
40-44	9	24	19	26	53	343	580	682	139	0	0	0	0	1,875
	\$58,249	\$68,736	\$69,062	\$78,829	\$74,591	\$82,282	\$88,898	\$94,624	\$103,530	\$0	\$0	\$0	\$0	\$89,705
45-49	5	6	10	7	18	144	303	434	639	114	0	0	0	1,680
	\$56,134	\$71,920	\$73,531	\$71,686	\$73,783	\$81,482	\$91,216	\$95,564	\$100,290	\$112,235	\$0	\$0	\$0	\$95,836
50-54	4	3	7	3	9	55	115	171	416	361	99	0	0	1,243
	\$63,295	\$72,142	\$99,771	\$89,401	\$91,306	\$79,934	\$87,702	\$91,376	\$99,578	\$107,046	\$110,960	\$0	\$0	\$99,291
55-59	1	6	3	1	4	27	42	82	137	178	235	10	0	726
	*	\$64,645	\$107,188	*	\$77,575	\$76,774	\$81,532	\$90,761	\$95,749	\$103,160	\$113,455	\$108,524	\$0	\$101,103
60-64	0	1	2	1	3	13	15	24	55	51	89	1	0	255
	\$0	*	\$73,317	*	\$59,213	\$84,156	\$89,813	\$89,175	\$90,628	\$102,719	\$104,238	*	\$0	\$96,915
65-69	0	0	1	0	0	3	3	4	6	8	5	0	0	30
	\$0	\$0	*	\$0	\$0	\$68,053	\$117,142	\$79,165	\$87,601	\$99,026	\$115,083	\$0	\$0	\$94,671
70 & Over	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	\$0	\$0	\$0	\$0	\$0	\$0	*	\$0	\$0	\$0	\$0	\$0	\$0	*
Total	109	194	201	233	458	1,919	1,771	1,520	1,392	712	428	11	0	8,948
	\$58,540	\$62,662	\$71,666	\$76,058	\$77,708	\$82,756	\$89,528	\$94,129	\$99,517	\$106,505	\$110,980	\$108,424	\$0	\$90,495

Average: Age 43.1 Service 14.1 Number of Participants: 7,521 Vested 1,427 Not Vested 846 Males 8,102 Females 846 Early Retirement Eligible: 567 Normal Retirement Eligible: 1,392

*Annual Salary omitted for privacy reasons.
Numbers of participants eligible for early and normal retirement are estimates only.

Age and Service Distribution of Active Fire Fighters (Number of Actives and Average Annual Salary) (Continued)															
LEOFF Plan 2															
Attained Age	Attained Years of Service														
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Total	
Under 25	9	17	7	7	8	0	0	0	0	0	0	0	0	48	
	\$44,708	\$55,005	\$68,023	\$73,595	\$82,739	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$62,306	\$0
25-29	45	71	54	80	112	144	0	0	0	0	0	0	0	506	\$0
	\$53,839	\$59,846	\$68,324	\$72,968	\$81,409	\$85,142	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$74,263	\$0
30-34	23	55	43	64	127	511	137	0	0	0	0	0	0	960	\$0
	\$53,903	\$58,950	\$67,027	\$74,050	\$82,265	\$88,096	\$92,551	\$0	\$0	\$0	\$0	\$0	\$0	\$83,591	\$0
35-39	11	25	27	56	63	399	526	96	1	0	0	0	0	1,204	\$0
	\$50,418	\$62,445	\$73,088	\$75,979	\$84,003	\$89,021	\$95,930	\$100,892	*	\$0	\$0	\$0	\$0	\$90,864	\$0
40-44	4	14	8	24	39	278	514	530	173	0	0	0	0	1,584	\$0
	\$51,832	\$60,867	\$75,016	\$73,635	\$81,208	\$89,083	\$95,360	\$102,259	\$107,451	\$0	\$0	\$0	\$0	\$96,692	\$0
45-49	1	11	10	7	11	96	229	363	469	135	2	0	0	1,334	\$0
	\$65,754	\$76,628	\$78,747	\$84,430	\$84,430	\$90,025	\$94,159	\$102,819	\$106,909	\$115,549	\$125,897	\$0	\$0	\$102,344	\$0
50-54	1	4	1	5	2	36	105	208	349	319	170	1	0	1,201	\$0
	\$95,748	\$111,022	\$111,022	\$111,022	\$62,944	\$87,908	\$94,635	\$98,169	\$107,795	\$111,752	\$119,329	*	\$0	\$106,985	\$0
55-59	0	2	1	2	2	12	51	72	177	165	242	1	0	727	\$0
	\$142,506	\$134,577	\$134,577	\$89,843	\$89,843	\$90,527	\$94,203	\$98,003	\$103,324	\$114,188	\$119,555	*	\$0	\$109,955	\$0
60-64	1	1	1	1	1	12	16	17	34	44	61	0	0	189	\$0
	\$0	\$0	\$0	\$0	\$0	\$84,783	\$101,008	\$98,756	\$109,411	\$110,027	\$112,487	\$0	\$0	\$105,979	\$0
65-69	0	0	0	0	0	0	4	2	3	3	7	0	0	19	\$0
	\$0	\$0	\$0	\$0	\$0	\$0	\$99,474	\$135,399	\$104,879	\$112,197	\$97,572	\$0	\$0	\$105,417	\$0
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	95	200	152	246	365	1,488	1,582	1,288	1,206	666	482	2	0	7,772	\$0
	\$52,878	\$61,414	\$69,902	\$75,553	\$82,134	\$88,356	\$95,114	\$101,422	\$106,776	\$113,013	\$118,288	\$118,288	\$0	\$96,547	\$0

Average: Age 43.2 Number of Participants: Vested 6,566 Males 7,312 Early Retirement Eligible: 537
 Service 14.6 Not Vested 1,206 Females 460 Normal Retirement Eligible: 1,340

*Annual Salary omitted for privacy reasons.

Numbers of participants eligible for early and normal retirement are estimates only.

Age/Years Retired Distribution

Age and Years Retired Distribution of Service Retired Law Enforcement Officers (Number of Service Retired Members and Average Monthly Benefit)																
LEOFF Plan 2																
Attained Age	Attained Years Retired															
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Total		
Under 50	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
50-54	28	42	15	10	9	0	0	0	0	0	0	0	0	104		
	\$3,104	\$3,183	\$3,612	\$3,623	\$3,053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,255		
55-59	28	88	103	69	74	146	0	0	0	0	0	0	0	508		
	\$4,455	\$4,000	\$3,578	\$2,924	\$2,684	\$2,788	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,253		
60-64	14	50	41	21	34	189	32	0	0	0	0	0	0	381		
	\$4,151	\$3,435	\$3,450	\$3,401	\$3,286	\$2,578	\$1,537	\$0	\$0	\$0	\$0	\$0	\$0	\$2,863		
65-69	5	21	10	13	7	70	63	0	0	0	0	0	0	189		
	\$3,940	\$2,506	\$3,198	\$2,728	\$2,576	\$2,531	\$1,451	\$0	\$0	\$0	\$0	\$0	\$0	\$2,256		
70-74	1	2	1	1	3	24	18	10	0	0	0	0	0	60		
	\$1,932	\$1,932	*	*	\$2,428	\$1,848	\$1,265	\$976	\$0	\$0	\$0	\$0	\$0	\$1,585		
75-79	0	0	0	0	0	3	5	8	1	0	0	0	0	17		
	\$0	\$0	\$0	\$0	\$0	\$1,368	\$1,563	\$803	*	\$0	\$0	\$0	\$0	\$1,166		
80-84	0	0	0	0	0	0	1	2	2	1	0	0	0	6		
	\$0	\$0	\$0	\$0	\$0	\$0	*	\$1,562	\$921	*	\$0	\$0	\$0	\$1,221		
85-89	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
90-94	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
95 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Total	76	203	170	114	127	432	119	20	3	1	0	0	0	1,265		
	\$3,845	\$3,517	\$3,532	\$3,026	\$2,859	\$2,593	\$1,452	\$965	\$1,110	*	\$0	\$0	\$0	\$2,870		

Average: Age 60.7
Years Retired 4.8

Males 1,154
Females 111

*Monthly benefit omitted for privacy reasons.

Age and Years Retired Distribution of Service Retired Fire Fighters (Number of Service Retired Members and Average Monthly Benefit)														
(Continued)														
LEOFF Plan 2														
Attained Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Total
Under 50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
50-54	10	19	3	3	0	0	0	0	0	0	0	0	0	35
	\$5,192	\$3,627	\$2,832	\$2,955	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,948
55-59	32	70	49	42	23	45	0	0	0	0	0	0	0	261
	\$4,723	\$4,677	\$3,960	\$3,457	\$3,338	\$2,753	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,902
60-64	14	49	30	17	21	102	10	0	0	0	0	0	0	243
	\$4,194	\$4,573	\$4,240	\$3,347	\$4,065	\$2,948	\$2,171	\$0	\$0	\$0	\$0	\$0	\$0	\$3,599
65-69	1	8	7	6	9	35	26	0	0	0	0	0	0	92
	*	\$2,958	\$2,457	\$3,747	\$2,775	\$2,562	\$2,024	\$0	\$0	\$0	\$0	\$0	\$0	\$2,550
70-74	0	2	3	1	4	14	8	3	0	0	0	0	0	35
	\$0	\$2,182	\$2,187	*	\$2,269	\$2,170	\$2,173	\$955	\$0	\$0	\$0	\$0	\$0	\$2,024
75-79	0	0	0	0	0	1	7	10	2	0	0	0	0	20
	\$0	\$0	\$0	\$0	\$0	*	\$1,552	\$1,095	\$1,330	\$0	\$0	\$0	\$0	\$1,281
80-84	0	0	0	0	0	0	0	1	3	0	0	0	0	4
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	*	\$691	\$0	\$0	\$0	\$0	\$1,239
85-89	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	*	\$0	\$0	\$0	\$0	*
90-94	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
95 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	57	148	92	69	57	197	51	14	6	0	0	0	0	691
	\$4,662	\$4,381	\$3,842	\$3,386	\$3,442	\$2,771	\$2,011	\$1,193	\$834	\$0	\$0	\$0	\$0	\$3,426

Average: Age 61.3
Years Retired 4.4

*Monthly benefit omitted for privacy reasons.

Males 664
Females 27

Age and Years Retired Distribution of All Law Enforcement Officers With Disabilities (Number of All Members With Disabilities and Average Monthly Benefit)														
LEOFF Plan 2														
Attained Age	Attained Years Retired													
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Total
Under 50	1	3	5	3	4	8	2	0	0	0	0	0	0	26
	*	\$1,976	\$2,300	\$1,318	\$1,436	\$1,168	\$430	\$0	\$0	\$0	\$0	\$0	\$0	\$1,531
50-54	0	1	4	1	3	7	5	0	0	0	0	0	0	21
	\$0	*	\$1,858	*	\$1,800	\$1,524	\$828	\$0	\$0	\$0	\$0	\$0	\$0	\$1,532
55-59	0	0	2	4	6	23	5	0	0	0	0	0	0	40
	\$0	\$0	\$2,276	\$2,553	\$3,552	\$2,804	\$876	\$0	\$0	\$0	\$0	\$0	\$0	\$2,623
60-64	0	4	3	4	4	20	5	0	1	0	0	0	0	41
	\$0	\$2,051	\$3,321	\$3,385	\$2,833	\$2,302	\$1,326	\$0	*	\$0	\$0	\$0	\$0	\$2,338
65-69	0	0	0	0	0	8	5	0	0	0	0	0	0	13
	\$0	\$0	\$0	\$0	\$0	\$2,386	\$1,632	\$0	\$0	\$0	\$0	\$0	\$0	\$2,096
70-74	0	0	0	0	0	0	1	1	0	0	0	0	0	2
	\$0	\$0	\$0	\$0	\$0	\$0	*	*	\$0	\$0	\$0	\$0	\$0	\$819
75-79	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
80-84	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	*	\$0	\$0	*
85-89	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
90-94	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
95 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	1	8	14	12	17	66	23	1	1	0	1	0	0	144
	*	\$2,121	\$2,389	\$2,450	\$2,576	\$2,267	\$1,101	*	*	\$0	*	\$0	\$0	\$2,096

Average: Age 56.7
 Years Retired 6.2

Males 118
 Females 26

*Monthly benefit omitted for privacy reasons.

Age and Years Retired Distribution of All Fire Fighters With Disabilities (Number of All Members With Disabilities and Average Monthly Benefit)													
(Continued)													
LEOFF Plan 2													
Attained Age	Attained Years Retired												
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over
Under 50	0	0	2	0	0	6	1	0	0	0	0	0	0
	\$0	\$0	\$1,131	\$0	\$0	\$920	*	\$0	\$0	\$0	\$0	\$0	\$0
50-54	0	1	3	1	1	6	1	0	0	0	0	0	0
	\$0	*	\$1,635	*	*	\$1,579	*	\$0	\$0	\$0	\$0	\$0	\$0
55-59	1	4	8	4	6	8	3	0	0	0	0	0	0
	\$5,319	\$3,921	\$3,921	\$3,292	\$3,141	\$2,851	\$2,123	\$0	\$0	\$0	\$0	\$0	\$0
60-64	0	3	0	3	4	10	3	0	0	0	0	0	0
	\$0	\$4,619	\$0	\$3,219	\$4,084	\$2,937	\$2,564	\$0	\$0	\$0	\$0	\$0	\$0
65-69	0	0	2	1	1	6	2	1	0	0	0	0	0
	\$0	\$0	\$3,114	*	*	\$2,417	\$1,460	*	\$0	\$0	\$0	\$0	\$0
70-74	0	0	0	0	0	1	1	1	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	*	*	*	\$0	\$0	\$0	\$0	\$0
75-79	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
80-84	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
85-89	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
90-94	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
95 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	1	8	15	9	12	37	11	2	0	0	0	0	0
	\$4,879	\$2,984	\$2,984	\$3,294	\$3,120	\$2,244	\$1,856	\$660	\$0	\$0	\$0	\$0	\$0
	95												
	\$2,725												

Average:

Age 57.8

Years Retired 5.5

*Monthly benefit omitted for privacy reasons.

Males 83

Females 12

Age and Years Retired Distribution of Survivors of Law Enforcement Officers (Number of Survivors and Average Monthly Benefit)														
(Continued)														
LEOFF Plan 2														
Attained Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Total
Under 50	1	2	16	5	1	6	0	0	0	0	0	0	0	31
	*	\$1,159	\$883	\$1,483	*	\$1,737	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,181
50-54	1	4	8	2	2	6	1	0	0	0	0	0	0	24
	*	\$3,843	\$718	\$1,289	\$2,773	\$1,709	*	\$0	\$0	\$0	\$0	\$0	\$0	\$1,798
55-59	1	0	6	3	2	7	2	0	0	0	0	0	0	21
	*	\$0	\$415	\$2,371	\$1,742	\$1,823	\$1,324	\$0	\$0	\$0	\$0	\$0	\$0	\$1,565
60-64	0	0	3	1	0	7	2	0	0	0	0	0	0	13
	\$0	\$0	\$1,384	*	\$0	\$2,479	\$1,415	\$0	\$0	\$0	\$0	\$0	\$0	\$2,031
65-69	0	0	1	1	0	3	2	0	0	0	0	0	0	7
	\$0	\$0	*	*	\$0	\$1,436	\$1,394	\$0	\$0	\$0	\$0	\$0	\$0	\$1,526
70-74	0	0	0	0	0	0	1	2	1	0	0	0	0	4
	\$0	\$0	\$0	\$0	\$0	\$0	*	\$1,102	*	\$0	\$0	\$0	\$0	\$887
75-79	0	0	1	0	0	0	1	0	0	0	0	0	0	2
	\$0	\$0	*	\$0	\$0	\$0	*	\$0	\$0	\$0	\$0	\$0	\$0	\$975
80-84	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	\$0	\$0	\$0	\$0	\$0	\$0	*	\$0	\$0	\$0	\$0	\$0	\$0	*
85-89	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
90-94	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
95 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	3	6	35	12	5	29	10	2	1	0	0	0	0	103
	\$2,677	\$2,948	\$859	\$1,614	\$2,081	\$1,900	\$1,387	\$1,102	*	\$0	\$0	\$0	\$0	\$1,525

Average: Age 53.3 Males 3

 Years Retired 4.9 Females 100

*Monthly benefit omitted for privacy reasons.

Age and Years Retired Distribution of Survivors of Fire Fighters (Number of Survivors and Average Monthly Benefit)														
(Continued)														
LEOFF Plan 2														
Attained Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Total
Under 50	0	4	3	1	1	3	0	0	0	0	0	0	0	12
	\$0	\$1,757	\$722	*	*	\$1,816	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,569
50-54	0	0	2	1	2	3	0	0	0	0	0	0	0	8
	\$0	\$0	\$4,717	*	\$6,895	\$2,039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,894
55-59	0	0	1	2	1	3	1	0	0	0	0	0	0	8
	\$0	\$0	*	\$1,314	*	\$2,245	*	\$0	\$0	\$0	\$0	\$0	\$0	\$1,637
60-64	0	1	2	2	0	4	2	1	0	0	0	0	0	12
	\$0	*	\$2,364	\$2,754	\$0	\$2,797	\$2,831	*	\$0	\$0	\$0	\$0	\$0	\$2,686
65-69	0	0	0	1	0	1	0	1	0	0	0	0	0	3
	\$0	\$0	\$0	*	\$0	*	\$0	*	\$0	\$0	\$0	\$0	\$0	\$3,033
70-74	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	*	\$0	\$0	\$0	\$0	\$0	*
75-79	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	*	\$0	\$0	\$0	\$0	\$0	*
80-84	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
85-89	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	*	\$0	\$0	\$0	\$0	*
90-94	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
95 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	0	5	8	7	4	14	3	4	1	0	0	0	0	46
	\$0	\$2,314	\$2,107	\$2,749	\$4,054	\$2,314	\$2,380	\$492	*	\$0	\$0	\$0	\$0	\$2,321

Average:

Years Retired

Age

55.1

6.0

Males

Females

1

45

*Monthly benefit omitted for privacy reasons.

Historical Data

Historical Data										
(Dollars in Millions)	2012	2011	2010	2009	2008	2007*	2006	2005	2004	2003
Contribution Information										
Employer Rate	4.64%	4.54%	4.54%	4.44%	4.34%	4.56%	4.66%	4.86%	4.57%	4.32%
State Rate	3.10%	3.03%	3.03%	2.96%	2.89%	3.04%	3.11%	3.24%	3.03%	2.88%
Employee Rate	7.74%	7.57%	7.57%	7.40%	7.23%	7.60%	7.77%	8.10%	7.60%	7.20%
Funded Status										
Projected Unit Credit Liability	\$6,071	\$5,576	\$5,078	\$4,349	\$3,786	\$3,386	\$3,323	\$2,932	\$2,521	\$2,194
Market Value of Assets	\$6,640	\$6,366	\$5,081	\$4,309	\$5,315	\$5,185	\$4,339	\$3,614	\$2,984	\$2,541
Actuarial Value of Assets	\$7,222	\$6,621	\$6,043	\$5,564	\$5,053	\$4,360	\$3,844	\$3,329	\$2,947	\$2,740
Unfunded Liability	(\$1,150)	(\$1,044)	(\$965)	(\$1,215)	(\$1,266)	(\$974)	(\$521)	(\$397)	(\$426)	(\$547)
Funded Ratio	118.9%	118.7%	119.0%	127.9%	133.4%	128.8%	115.7%	113.5%	116.9%	124.9%
Participant Data										
Number of Actives	16,720	16,805	16,775	16,951	16,626	16,099	15,718	15,168	14,754	14,560
Total Annual Salaries	\$1,560	\$1,535	\$1,490	\$1,443	\$1,345	\$1,234	\$1,172	\$1,092	\$1,020	\$967
Number of Terminated Vested	689	655	781	672	649	629	597	570	521	439
Number of Terminated, Not Vested	1,558	1,617	1,707	1,663	1,531	1,433	1,362	1,285	1,233	1,186
Number of Retirees and Beneficiaries	2,344	2,015	1,639	1,367	1,134	924	779	574	432	316
Total Annual Benefits	\$82	\$65	\$49	\$38	\$29	\$22	\$17	\$11	\$8	\$5
Assumptions										
Valuation Interest Rate	7.50%	7.50%	8.00%	8.00%	8.00%	5.94%	8.00%	8.00%	8.00%	8.00%
Salary Increase	5.43%	5.61%	6.55%	6.61%	6.61%	5.49%	7.40%	7.40%	7.60%	7.70%
Inflation**	3.00%	3.00%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
Growth in Membership	1.25%	1.25%	1.25%	1.25%	1.25%	0.94%	1.25%	1.25%	1.25%	1.25%
Actuarial Experience										
Return on Market Value	1.45%	21.08%	12.99%	(22.64%)	(1.33%)	16.61%	15.77%	17.55%	13.64%	15.13%
Return on Actuarial Value	6.25%	6.15%	4.84%	5.72%	11.04%	10.03%	10.80%	9.30%	4.10%	0.60%
Salary Increase	3.22%	3.48%	5.35%	6.69%	7.65%	4.31%	5.50%	5.90%	5.20%	4.80%
Inflation	3.17%	0.78%	0.44%	4.48%	3.79%	3.73%	3.02%	1.57%	1.41%	1.81%
Growth in Membership	(0.87%)	(0.12%)	0.17%	1.53%	2.62%	1.83%	2.66%	1.85%	0.33%	2.59%
COLA***	3.00%	0.78%-3%	0.44%-3%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%

*For the 2007 valuation, the salary, interest, and growth rates were not annualized. They reflect the actual valuation period of nine months.

**Based on the assumption for prior year's CPI: Urban Wage Earners & Clerical Workers, Seattle-Tacoma-Bremerton, WA - All Items.

***COLA is based on the CPI (3% maximum per year).

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 7.5 percent.

Actuarial Value of Assets

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 smooths 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 normal cost is determined on an individual basis, from a member's age at plan entry, and is designed to be a level percentage of pay throughout a member's career.

Funded Ratio

The ratio of a plan's current assets to the present value of earned pensions. There are several acceptable methods of measuring a plan's assets and liabilities.

Market Value of Assets (MVA)

The market value of assets is the value of the pension fund based on the value of the assets as they would trade on an open market, including accrued income and expenses.

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 equals the total normal cost of the plan reduced by employee contributions.

Present Value of Fully Projected Benefits

Computed by projecting the total future benefit payments from the plan, using actuarial assumptions (i.e., probability of death or retirement, salary increases, etc.), and discounting the payments to the valuation date using the valuation interest rate to determine the present value (today's value).

Present Value of Future Salaries (PVFS)

The value of future expected salaries discounted with interest to the valuation date.

Projected Unit Credit (PUC) Actuarial Cost Method

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

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

The PUC normal cost is the estimated present value of projected benefits current plan members will earn in the year following the valuation date.

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 that not covered by current plan assets.

WASHINGTON STATE

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