

November 2017

Applegate Valley Rural Fire Protection District #9/2664
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



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Applegate Valley Rural Fire Protection District #9/2664

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



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This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

Applegate Valley Rural Fire Protection District #9 -- #2664

November 2017

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Executive Summary

Milliman has prepared this report for Applegate Valley Rural Fire Protection District #9 to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to Applegate Valley Rural Fire Protection District #9.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for Applegate Valley Rural Fire Protection District #9

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	19.44%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	0.39%	0.39%	0.39%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	21.39%	10.44%	15.17%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	21.88%	10.86%	15.59%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 68%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	15.99%	15.99%
Minimum 2019-2021 Rate	12.79%	9.59%
Maximum 2019-2021 Rate	19.19%	22.39%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$1,483,793	\$1,483,736	(\$57)	100%	\$461,525	0%
12/31/2012	1,735,182	1,708,530	(26,652)	102%	486,254	(5%)
12/31/2013	2,030,453	1,929,051	(101,402)	105%	528,604	(19%)
12/31/2014	2,207,562	2,393,369	185,807	92%	533,698	35%
12/31/2015	2,240,228	2,653,532	413,304	84%	626,420	66%
12/31/2016	2,039,923	3,002,366	962,443	68%	485,055	198%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

Applegate Valley Rural Fire Protection District #9

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$962,443	\$413,304
Allocated pooled OPSRP UAL	83,508	89,054
Side account	0	0
Net unfunded pension actuarial accrued liability	1,045,951	502,358
Combined valuation payroll	485,055	626,420
Net pension UAL as a percentage of payroll	216%	80%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$66)	\$3,042

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer’s combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$49,907	\$77,235
Tier 1/Tier 2 valuation payroll	256,664	436,423
Tier 1/Tier 2 pension normal cost rate	19.44%	17.70%
Tier 1/ Tier 2 Actuarial accrued liability	\$3,002,366	\$2,653,532
Actuarial asset value	2,039,923	2,240,228
Tier 1/Tier 2 Unfunded actuarial accrued liability	962,443	413,304
Tier 1/ Tier 2 Funded status	68%	84%
Combined valuation payroll	\$485,055	\$626,420
Tier 1/Tier 2 UAL as a percentage of payroll	198%	66%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	0.39%	(1.71%)
Tier 1/Tier 2 active members ¹	3	5
Tier 1/Tier 2 dormant members	2	2
Tier 1/Tier 2 retirees and beneficiaries	4	2

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	485,055	626,420
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$262,437	\$342,767
2. Employer reserves	1,173,477	1,710,413
3. Benefits in force reserve	604,009	187,048
4. Total market value of assets (1. + 2. + 3.)	\$2,039,923	\$2,240,228

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$2,240,228
2. Regular employer contributions	43,640
3. Benefit payments and expenses	(118,262)
4. Adjustments ¹	(292,330)
5. Interest credited	166,647
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$2,039,923

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$2,335	\$26,641
Tier 1 General Service	0	0
Tier 2 Police & Fire	47,572	43,370
Tier 2 General Service	0	7,224
Total	\$49,907	\$77,235

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$48,092	\$49,907	\$1,815

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$255,265	\$926,164
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	1,049,482	935,543
▪ Tier 2 General Service	0	130,005
▪ Total Active Members	\$1,304,747	\$1,991,712
Dormant Members	271,161	257,947
Retired Members and Beneficiaries	1,426,458	403,873
Total Actuarial Accrued Liability	\$3,002,366	\$2,653,532

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$2,924,825	\$3,002,366	\$77,541

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$3,002,366	\$2,653,532
2. Actuarial value of assets	2,039,923	2,240,228
3. Unfunded accrued liability (1. – 2.)	962,443	413,304
4. Funded percentage (2. ÷ 1.)	68%	84%
5. Combined valuation payroll	\$485,055	\$626,420
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	198%	66%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$101,324)	(\$7,878)	(\$7,285)	(\$100,731)	(\$7,983)
December 31, 2015	\$514,628	\$37,238	\$37,109	\$514,499	\$37,648
December 31, 2016	N/A	N/A	N/A	\$548,675	\$38,740
Total				\$962,443	\$68,405

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$2,653,532
b. Normal cost at December 31, 2015 (excluding assumed expenses)	73,679
c. Benefit payments during 2016	(117,267)
d. Interest at 7.50% to December 31, 2016	197,380
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	2,807,324
f. Change in actuarial accrued liability due to assumption, method, and plan changes	77,541
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	2,884,865
2. Actuarial accrued liability at December 31, 2016	3,002,366
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(117,501)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	2,240,228
b. Contributions for 2016 ¹	43,640
c. Benefit payments and expenses during 2016	(118,262)
d. Interest at 7.50% to December 31, 2016	165,219
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	2,330,825
5. Actuarial value of assets at December 31, 2016	2,039,923
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(290,901)
7. Total actuarial gain/(loss) (3. + 6.)	(\$408,402)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$413,304
2. Expected increase	63,196
3. Liability (gain)/loss	117,501
4. Asset (gain)/loss	290,901
5. Change due to changes in assumptions, methods, and plan provisions	77,541
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$962,443

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$2,335	\$8,387	27.84%	\$26,641	\$145,663	18.29%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	47,572	248,277	19.16%	43,370	237,720	18.24%
Tier 2 General Service	0	0	0.00%	7,224	53,040	13.62%
Total	\$49,907	\$256,664	19.44%	\$77,235	\$436,423	17.70%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$962,443	\$413,304
2. Next year's Tier 1/Tier 2 UAL payment	68,405	29,360
3. Combined valuation payroll	485,055	626,420
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	14.10%	4.69%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	19.44%	17.70%
b. Tier 1/Tier 2 UAL rate	14.10%	4.69%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	33.68%	22.54%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	15.99%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	15.99%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.20%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.20%
c. Funded percentage	68%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.84%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	12.15%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	19.83%
7. Advisory July 1, 2019 total pension rate, before adjustment	33.68%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(13.85%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	14.10%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	0.25%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	19.83%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	19.44%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	19.44%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	19.83%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	19.44%	17.70%
b. Tier 1/Tier 2 UAL rate	0.25%	(1.86%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	19.83%	15.99%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$8,387	\$8,387
Tier 2	0	248,277	248,277
Tier 1/Tier 2 valuation payroll	0	256,664	256,664
OPSRP valuation payroll	0	228,391	228,391
Combined valuation payroll	\$0	\$485,055	\$485,055

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	0	0	0	0	1	0	1
Police & Fire	0	3	4	7	1	3	3	7
Total	0	3	4	7	1	4	3	8
Active Members with previous service segments with the employer								
General Service	0	1	N/A	1	0	0	N/A	0
Police & Fire	2	4	N/A	6	1	4	N/A	5
Total	2	5	N/A	7	1	4	N/A	5
Dormant Members								
General Service	0	0	0	0	0	0	0	0
Police & Fire	1	1	0	2	1	1	0	2
Total	1	1	0	2	1	1	0	2
Retired Members and Beneficiaries								
General Service	0	1	0	1	0	0	0	0
Police & Fire	3	0	0	3	2	0	0	2
Total	3	1	0	4	2	0	0	2
Grand Total Number of Members	6	10	4	20	5	9	3	17

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44				1						1
45-49				1						1
50-54										
55-59										
60-64				1						1
65-69										
70-74										
75+										
Total	0	0	0	3	0	0	0	0	0	3

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59	1	4,206
35-39			60-64	2	625
40-44			65-69	1	2,242
45-49			70-74		
50-54	1	371	75-79		
55-59			80-84		
60-64			85-89		
65-69	1	1,574	90-94		
70-74			95-99		
75+			100+		
Total	2	973	Total	4	1,925

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called "funding method," a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

Banks Fire District #13/2702
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
Banks Fire District #13/2702

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
Banks Fire District #13/2702

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

Banks Fire District #13 -- #2702

November 2017

This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

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Executive Summary

Milliman has prepared this report for Banks Fire District #13 to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to Banks Fire District #13.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for Banks Fire District #13

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	21.24%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	4.27%	4.27%	4.27%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	27.07%	14.32%	19.05%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	27.56%	14.74%	19.47%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 72%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	21.26%	21.26%
Minimum 2019-2021 Rate	17.01%	12.76%
Maximum 2019-2021 Rate	25.51%	29.76%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$458,745	\$561,533	\$102,788	82%	\$169,149	61%
12/31/2012	539,106	634,391	95,285	85%	153,539	62%
12/31/2013	568,184	715,252	147,068	79%	77,362	190%
12/31/2014	580,633	878,585	297,952	66%	186,062	160%
12/31/2015	578,918	846,963	268,045	68%	217,257	123%
12/31/2016	606,475	842,840	236,365	72%	187,013	126%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

Banks Fire District #13

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$236,365	\$268,045
Allocated pooled OPSRP UAL	32,197	30,886
Side account	0	0
Net unfunded pension actuarial accrued liability	268,562	298,931
Combined valuation payroll	187,013	217,257
Net pension UAL as a percentage of payroll	144%	138%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$25)	\$1,055

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$20,557	\$19,880
Tier 1/Tier 2 valuation payroll	96,767	101,569
Tier 1/Tier 2 pension normal cost rate	21.24%	19.57%
Tier 1/ Tier 2 Actuarial accrued liability	\$842,840	\$846,963
Actuarial asset value	606,475	578,918
Tier 1/Tier 2 Unfunded actuarial accrued liability	236,365	268,045
Tier 1/ Tier 2 Funded status	72%	68%
Combined valuation payroll	\$187,013	\$217,257
Tier 1/Tier 2 UAL as a percentage of payroll	126%	123%
Tier 1/Tier 2 UAL rate	4.27%	1.69%
(includes Multnomah Fire District #10)		
Tier 1/Tier 2 active members ¹	1	1
Tier 1/Tier 2 dormant members	1	0
Tier 1/Tier 2 retirees and beneficiaries	4	4

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	187,013	217,257
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$27,409	\$25,894
2. Employer reserves	317,737	276,750
3. Benefits in force reserve	261,329	276,274
4. Total market value of assets (1. + 2. + 3.)	\$606,475	\$578,918

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$578,918
2. Regular employer contributions	19,981
3. Benefit payments and expenses	(51,167)
4. Adjustments ¹	17,584
5. Interest credited	41,159
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$606,475

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	0	0
Tier 2 Police & Fire	20,557	19,880
Tier 2 General Service	0	0
Total	\$20,557	\$19,880

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$19,846	\$20,557	\$711

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	22,583	21,223
▪ Tier 2 Police & Fire	164,852	190,290
▪ Tier 2 General Service	0	38,920
▪ Total Active Members	\$187,435	\$250,433
Dormant Members	38,236	0
Retired Members and Beneficiaries	617,169	596,530
Total Actuarial Accrued Liability	\$842,840	\$846,963

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$813,168	\$842,840	\$29,672

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$842,840	\$846,963
2. Actuarial value of assets	606,475	578,918
3. Unfunded accrued liability (1. – 2.)	236,365	268,045
4. Funded percentage (2. ÷ 1.)	72%	68%
5. Combined valuation payroll	\$187,013	\$217,257
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	126%	123%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$146,955	\$11,426	\$10,565	\$146,094	\$11,578
December 31, 2015	\$121,090	\$8,762	\$8,732	\$121,060	\$8,858
December 31, 2016	N/A	N/A	N/A	(\$30,789)	(\$2,174)
Total				\$236,365	\$18,262

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$846,963
b. Normal cost at December 31, 2015 (excluding assumed expenses)	18,842
c. Benefit payments during 2016	(50,737)
d. Interest at 7.50% to December 31, 2016	62,326
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	877,394
f. Change in actuarial accrued liability due to assumption, method, and plan changes	29,672
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	907,066
2. Actuarial accrued liability at December 31, 2016	842,840
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	64,226
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	578,918
b. Contributions for 2016 ¹	19,981
c. Benefit payments and expenses during 2016	(51,167)
d. Interest at 7.50% to December 31, 2016	42,249
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	589,982
5. Actuarial value of assets at December 31, 2016	606,475
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	16,493
7. Total actuarial gain/(loss) (3. + 6.)	\$80,719

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$268,045
2. Expected increase	19,367
3. Liability (gain)/loss	(64,226)
4. Asset (gain)/loss	(16,493)
5. Change due to changes in assumptions, methods, and plan provisions	29,672
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$236,365

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	20,557	96,767	21.24%	19,880	101,569	19.57%
Tier 2 General Service	0	0	0.00%	0	0	0.00%
Total	\$20,557	\$96,767	21.24%	\$19,880	\$101,569	19.57%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$236,365	\$268,045
2. Next year's Tier 1/Tier 2 UAL payment	18,262	20,188
3. Combined valuation payroll	187,013	217,257
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	9.77%	9.29%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	21.24%	19.57%
b. Tier 1/Tier 2 UAL rate	9.77%	9.29%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	31.15%	29.01%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	21.26%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	21.26%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	4.25%
b. Preliminary size of rate collar (maximum of 3% or a.)	4.25%
c. Funded percentage	72%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	4.25%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	17.01%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	25.51%
7. Advisory July 1, 2019 total pension rate, before adjustment	31.15%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(5.64%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	9.77%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	4.13%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	25.51%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	21.24%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	21.24%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	25.51%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	21.24%	19.57%
b. Tier 1/Tier 2 UAL rate	4.13%	1.54%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	25.51%	21.26%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$0	\$0
Tier 2	0	96,767	96,767
Tier 1/Tier 2 valuation payroll	0	96,767	96,767
OPSRP valuation payroll	29,358	60,888	90,246
Combined valuation payroll	\$29,358	\$157,655	\$187,013

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	0	1	1	0	0	0	0
Police & Fire	0	1	1	2	0	1	2	3
Total	0	1	2	3	0	1	2	3
Active Members with previous service segments with the employer								
General Service	1	0	N/A	1	1	1	N/A	2
Police & Fire	0	1	N/A	1	0	1	N/A	1
Total	1	1	N/A	2	1	2	N/A	3
Dormant Members								
General Service	0	1	0	1	0	0	0	0
Police & Fire	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0
Retired Members and Beneficiaries								
General Service	1	0	0	1	1	0	0	1
Police & Fire	3	0	0	3	3	0	0	3
Total	4	0	0	4	4	0	0	4
Grand Total Number of Members	5	3	2	10	5	3	2	10

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49										
50-54				1						1
55-59										
60-64										
65-69										
70-74										
75+										
Total	0	0	0	1	0	0	0	0	0	1

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64	1	1,653
40-44			65-69		
45-49			70-74	2	756
50-54			75-79	1	535
55-59	1	299	80-84		
60-64			85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total	1	299	Total	4	925

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called "funding method," a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

Bend Parks & Recreation/2596
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.

November 2017
Bend Parks & Recreation/2596

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
Bend Parks & Recreation/2596

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

Bend Parks & Recreation -- #2596

November 2017

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Executive Summary

Milliman has prepared this report for Bend Parks & Recreation to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to Bend Parks & Recreation.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for Bend Parks & Recreation

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	13.55%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	4.66%	4.66%	4.66%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	19.77%	14.71%	19.44%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	20.26%	15.13%	19.86%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 67%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	14.31%	14.31%
Minimum 2019-2021 Rate	11.31%	8.31%
Maximum 2019-2021 Rate	17.31%	20.31%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$11,574,356	\$13,624,264	\$2,049,908	85%	\$5,084,185	40%
12/31/2012	12,908,743	14,482,667	1,573,924	89%	5,137,769	31%
12/31/2013	14,514,102	15,625,224	1,111,122	93%	5,832,411	19%
12/31/2014	15,166,419	18,905,398	3,738,979	80%	6,929,756	54%
12/31/2015	15,168,590	20,375,765	5,207,175	74%	7,132,955	73%
12/31/2016	14,743,663	22,098,399	7,354,736	67%	8,161,184	90%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

Bend Parks & Recreation

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$7,354,736	\$5,207,175
Allocated pooled OPSRP UAL	1,405,047	1,014,049
Side account	0	0
Net unfunded pension actuarial accrued liability	8,759,783	6,221,224
Combined valuation payroll	8,161,184	7,132,955
Net pension UAL as a percentage of payroll	107%	87%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$1,111)	\$34,635

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$377,819	\$368,584
Tier 1/Tier 2 valuation payroll	2,788,702	2,816,573
Tier 1/Tier 2 pension normal cost rate	13.55%	13.09%
Tier 1/ Tier 2 Actuarial accrued liability	\$22,098,399	\$20,375,765
Actuarial asset value	14,743,663	15,168,590
Tier 1/Tier 2 Unfunded actuarial accrued liability	7,354,736	5,207,175
Tier 1/ Tier 2 Funded status	67%	74%
Combined valuation payroll	\$8,161,184	\$7,132,955
Tier 1/Tier 2 UAL as a percentage of payroll	90%	73%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	4.66%	1.22%
Tier 1/Tier 2 active members ¹	43	45
Tier 1/Tier 2 dormant members	69	72
Tier 1/Tier 2 retirees and beneficiaries	94	89

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	8,161,184	7,132,955
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$2,209,926	\$2,780,326
2. Employer reserves	7,729,777	8,178,539
3. Benefits in force reserve	4,803,960	4,209,725
4. Total market value of assets (1. + 2. + 3.)	\$14,743,663	\$15,168,590

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$15,168,590
2. Regular employer contributions	274,325
3. Benefit payments and expenses	(940,592)
4. Adjustments ¹	(791,316)
5. Interest credited	1,032,656
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$14,743,663

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	214,516	210,252
Tier 2 Police & Fire	0	0
Tier 2 General Service	163,303	158,332
Total	\$377,819	\$368,584

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$371,771	\$377,819	\$6,048

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	5,842,165	5,385,375
▪ Tier 2 Police & Fire	0	0
▪ Tier 2 General Service	3,479,730	3,091,003
▪ Total Active Members	\$9,321,895	\$8,476,378
Dormant Members	1,431,233	2,809,786
Retired Members and Beneficiaries	11,345,271	9,089,601
Total Actuarial Accrued Liability	\$22,098,399	\$20,375,765

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$21,515,096	\$22,098,399	\$583,303

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$22,098,399	\$20,375,765
2. Actuarial value of assets	14,743,663	15,168,590
3. Unfunded accrued liability (1. – 2.)	7,354,736	5,207,175
4. Funded percentage (2. ÷ 1.)	67%	74%
5. Combined valuation payroll	\$8,161,184	\$7,132,955
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	90%	73%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$1,110,265	\$86,328	\$79,821	\$1,103,758	\$87,475
December 31, 2015	\$4,096,910	\$296,448	\$295,425	\$4,095,887	\$299,714
December 31, 2016	N/A	N/A	N/A	\$2,155,091	\$152,163
Total				\$7,354,736	\$539,352

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$20,375,765
b. Normal cost at December 31, 2015 (excluding assumed expenses)	351,591
c. Benefit payments during 2016	(932,682)
d. Interest at 7.50% to December 31, 2016	1,506,391
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	21,301,065
f. Change in actuarial accrued liability due to assumption, method, and plan changes	583,303
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	21,884,368
2. Actuarial accrued liability at December 31, 2016	22,098,399
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(214,031)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	15,168,590
b. Contributions for 2016 ¹	274,325
c. Benefit payments and expenses during 2016	(940,592)
d. Interest at 7.50% to December 31, 2016	1,112,659
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	15,614,982
5. Actuarial value of assets at December 31, 2016	14,743,663
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(871,319)
7. Total actuarial gain/(loss) (3. + 6.)	(\$1,085,350)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$5,207,175
2. Expected increase	478,908
3. Liability (gain)/loss	214,031
4. Asset (gain)/loss	871,319
5. Change due to changes in assumptions, methods, and plan provisions	583,303
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$7,354,736

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	214,516	1,416,630	15.14%	210,252	1,435,132	14.65%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	163,303	1,372,072	11.90%	158,332	1,381,441	11.46%
Total	\$377,819	\$2,788,702	13.55%	\$368,584	\$2,816,573	13.09%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$7,354,736	\$5,207,175
2. Next year's Tier 1/Tier 2 UAL payment	539,352	382,776
3. Combined valuation payroll	8,161,184	7,132,955
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	6.61%	5.37%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	13.55%	13.09%
b. Tier 1/Tier 2 UAL rate	6.61%	5.37%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	20.30%	18.61%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	14.31%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	14.31%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	2.86%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.00%
c. Funded percentage	67%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.90%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	10.41%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	18.21%
7. Advisory July 1, 2019 total pension rate, before adjustment	20.30%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(2.09%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	6.61%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	4.52%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	18.21%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	13.55%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	13.55%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	18.21%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	13.55%	13.09%
b. Tier 1/Tier 2 UAL rate	4.52%	1.07%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	18.21%	14.31%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$1,416,630	\$0	\$1,416,630
Tier 2	1,372,072	0	1,372,072
Tier 1/Tier 2 valuation payroll	2,788,702	0	2,788,702
OPSRP valuation payroll	5,372,482	0	5,372,482
Combined valuation payroll	\$8,161,184	\$0	\$8,161,184

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	21	22	160	203	21	24	129	174
Police & Fire	0	0	0	0	0	0	0	0
Total	21	22	160	203	21	24	129	174
Active Members with previous service segments with the employer								
General Service	23	60	N/A	83	19	51	N/A	70
Police & Fire	0	0	N/A	0	0	0	N/A	0
Total	23	60	N/A	83	19	51	N/A	70
Dormant Members								
General Service	30	39	25	94	32	40	24	96
Police & Fire	0	0	0	0	0	0	0	0
Total	30	39	25	94	32	40	24	96
Retired Members and Beneficiaries								
General Service	81	13	4	98	76	13	3	92
Police & Fire	0	0	0	0	0	0	0	0
Total	81	13	4	98	76	13	3	92
Grand Total Number of Members	155	134	189	478	148	128	156	432

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34			1							1
35-39			1	1						2
40-44			3	2	1	1				7
45-49		1	1	2	3					7
50-54			2	1	3	1	1			8
55-59			2	4	3	1				10
60-64			4		1		2			7
65-69					1					1
70-74										
75+										
Total	0	1	14	10	12	3	3	0	0	43

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54	1	43
30-34	5	186	55-59	5	629
35-39	2	81	60-64	27	687
40-44	9	210	65-69	37	893
45-49	12	351	70-74	18	531
50-54	11	423	75-79	4	860
55-59	13	83	80-84	1	608
60-64	12	96	85-89		
65-69	4	466	90-94	1	677
70-74	1	18	95-99		
75+			100+		
Total	69	231	Total	94	735

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

Black Butte Ranch Rural Fire Protection District/2648
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
Black Butte Ranch Rural Fire Protection District/2648

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
Black Butte Ranch Rural Fire Protection District/2648

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

Black Butte Ranch Rural Fire Protection District -- #2648

November 2017

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Executive Summary

Milliman has prepared this report for Black Butte Ranch Rural Fire Protection District to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to Black Butte Ranch Rural Fire Protection District.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for Black Butte Ranch Rural Fire Protection District

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	22.53%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	(4.82%)	(4.82%)	(4.82%)
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	19.27%	5.23%	9.96%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	19.76%	5.65%	10.38%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 82%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	14.71%	14.71%
Minimum 2019-2021 Rate	11.71%	8.71%
Maximum 2019-2021 Rate	17.71%	20.71%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$3,324,045	\$3,404,058	\$80,013	98%	\$618,314	13%
12/31/2012	3,629,332	3,581,851	(47,481)	101%	702,997	(7%)
12/31/2013	4,050,159	3,942,757	(107,402)	103%	750,341	(14%)
12/31/2014	4,211,458	4,795,182	583,724	88%	776,122	75%
12/31/2015	4,197,702	5,051,937	854,235	83%	791,350	108%
12/31/2016	4,380,583	5,340,729	960,146	82%	801,913	120%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

Black Butte Ranch Rural Fire Protection District

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$960,146	\$854,235
Allocated pooled OPSRP UAL	138,059	112,501
Side account	0	0
Net unfunded pension actuarial accrued liability	1,098,205	966,736
Combined valuation payroll	801,913	791,350
Net pension UAL as a percentage of payroll	137%	122%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$109)	\$3,843

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$80,768	\$77,231
Tier 1/Tier 2 valuation payroll	358,441	362,923
Tier 1/Tier 2 pension normal cost rate	22.53%	21.28%
Tier 1/ Tier 2 Actuarial accrued liability	\$5,340,729	\$5,051,937
Actuarial asset value	4,380,583	4,197,702
Tier 1/Tier 2 Unfunded actuarial accrued liability	960,146	854,235
Tier 1/ Tier 2 Funded status	82%	83%
Combined valuation payroll	\$801,913	\$791,350
Tier 1/Tier 2 UAL as a percentage of payroll	120%	108%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	(4.82%)	(6.57%)
Tier 1/Tier 2 active members ¹	3	3
Tier 1/Tier 2 dormant members	3	3
Tier 1/Tier 2 retirees and beneficiaries	12	12

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	801,913	791,350
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$644,139	\$610,228
2. Employer reserves	2,781,932	2,577,656
3. Benefits in force reserve	954,512	1,009,819
4. Total market value of assets (1. + 2. + 3.)	\$4,380,583	\$4,197,702

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$4,197,702
2. Regular employer contributions	19,587
3. Benefit payments and expenses	(186,889)
4. Adjustments ¹	54,410
5. Interest credited	295,772
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$4,380,583

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$53,743	\$51,403
Tier 1 General Service	0	0
Tier 2 Police & Fire	27,025	25,828
Tier 2 General Service	0	0
Total	\$80,768	\$77,231

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$77,711	\$80,768	\$3,057

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$2,214,919	\$2,063,491
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	541,567	491,813
▪ Tier 2 General Service	0	0
▪ Total Active Members	\$2,756,486	\$2,555,304
Dormant Members	330,020	316,241
Retired Members and Beneficiaries	2,254,223	2,180,392
Total Actuarial Accrued Liability	\$5,340,729	\$5,051,937

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$5,184,375	\$5,340,729	\$156,354

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$5,340,729	\$5,051,937
2. Actuarial value of assets	4,380,583	4,197,702
3. Unfunded accrued liability (1. – 2.)	960,146	854,235
4. Funded percentage (2. ÷ 1.)	82%	83%
5. Combined valuation payroll	\$801,913	\$791,350
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	120%	108%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$107,319)	(\$8,345)	(\$7,716)	(\$106,690)	(\$8,455)
December 31, 2015	\$961,554	\$69,577	\$69,337	\$961,314	\$70,343
December 31, 2016	N/A	N/A	N/A	\$105,522	\$7,451
Total				\$960,146	\$69,339

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$5,051,937
b. Normal cost at December 31, 2015 (excluding assumed expenses)	73,657
c. Benefit payments during 2016	(185,317)
d. Interest at 7.50% to December 31, 2016	374,708
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	5,314,985
f. Change in actuarial accrued liability due to assumption, method, and plan changes	156,354
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	5,471,339
2. Actuarial accrued liability at December 31, 2016	5,340,729
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	130,610
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	4,197,702
b. Contributions for 2016 ¹	19,587
c. Benefit payments and expenses during 2016	(186,889)
d. Interest at 7.50% to December 31, 2016	308,554
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	4,338,954
5. Actuarial value of assets at December 31, 2016	4,380,583
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	41,629
7. Total actuarial gain/(loss) (3. + 6.)	\$172,239

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$854,235
2. Expected increase	121,796
3. Liability (gain)/loss	(130,610)
4. Asset (gain)/loss	(41,629)
5. Change due to changes in assumptions, methods, and plan provisions	156,354
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$960,146

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$53,743	\$237,524	22.63%	\$51,403	\$241,373	21.30%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	27,025	120,917	22.35%	25,828	121,550	21.25%
Tier 2 General Service	0	0	0.00%	0	0	0.00%
Total	\$80,768	\$358,441	22.53%	\$77,231	\$362,923	21.28%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$960,146	\$854,235
2. Next year's Tier 1/Tier 2 UAL payment	69,339	61,232
3. Combined valuation payroll	801,913	791,350
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	8.65%	7.74%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	22.53%	21.28%
b. Tier 1/Tier 2 UAL rate	8.65%	7.74%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	31.32%	29.17%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	14.71%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	14.71%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	2.94%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.00%
c. Funded percentage	82%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.00%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	11.71%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	17.71%
7. Advisory July 1, 2019 total pension rate, before adjustment	31.32%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(13.61%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	8.65%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	(4.96%)
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	17.71%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	22.53%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	22.53%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	17.71%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	22.53%	21.28%
b. Tier 1/Tier 2 UAL rate	(4.96%)	(6.72%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	17.71%	14.71%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$237,524	\$237,524
Tier 2	0	120,917	120,917
Tier 1/Tier 2 valuation payroll	0	358,441	358,441
OPSRP valuation payroll	57,894	385,578	443,472
Combined valuation payroll	\$57,894	\$744,019	\$801,913

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	0	1	1	0	0	1	1
Police & Fire	2	1	4	7	2	1	4	7
Total	2	1	5	8	2	1	5	8
Active Members with previous service segments with the employer								
General Service	0	0	N/A	0	0	0	N/A	0
Police & Fire	4	2	N/A	6	4	2	N/A	6
Total	4	2	N/A	6	4	2	N/A	6
Dormant Members								
General Service	0	0	0	0	0	0	0	0
Police & Fire	2	1	0	3	2	1	0	3
Total	2	1	0	3	2	1	0	3
Retired Members and Beneficiaries								
General Service	1	0	0	1	1	0	0	1
Police & Fire	11	0	0	11	11	0	0	11
Total	12	0	0	12	12	0	0	12
Grand Total Number of Members	20	4	5	29	20	4	5	29

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49					1					1
50-54			1			1				2
55-59										
60-64										
65-69										
70-74										
75+										
Total	0	0	1	0	1	1	0	0	0	3

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59	2	1,302
35-39			60-64	2	650
40-44	2	1,235	65-69	2	1,594
45-49			70-74	2	1,889
50-54			75-79	3	714
55-59	1	634	80-84	1	95
60-64			85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total	3	1,035	Total	12	1,092

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called "funding method," a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

Boardman Rural Fire Protection District/2833
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
Boardman Rural Fire Protection District/2833

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
Boardman Rural Fire Protection District/2833

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

Boardman Rural Fire Protection District -- #2833

November 2017

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Executive Summary

Milliman has prepared this report for Boardman Rural Fire Protection District to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to Boardman Rural Fire Protection District.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for Boardman Rural Fire Protection District

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	21.92%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	1.04%	1.04%	1.04%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	24.52%	11.09%	15.82%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	25.01%	11.51%	16.24%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 87%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	20.53%	20.53%
Minimum 2019-2021 Rate	16.42%	12.31%
Maximum 2019-2021 Rate	24.64%	28.75%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$232,340	\$251,708	\$19,368	92%	\$318,829	6%
12/31/2012	279,659	285,777	6,118	98%	336,480	2%
12/31/2013	333,886	317,127	(16,759)	105%	386,969	(4%)
12/31/2014	364,641	388,362	23,721	94%	404,148	6%
12/31/2015	382,453	430,058	47,605	89%	446,761	11%
12/31/2016	424,023	484,789	60,766	87%	480,648	13%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

Boardman Rural Fire Protection District

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$60,766	\$47,605
Allocated pooled OPSRP UAL	82,749	63,513
Side account	0	0
Net unfunded pension actuarial accrued liability	143,515	111,118
Combined valuation payroll	480,648	446,761
Net pension UAL as a percentage of payroll	30%	25%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$65)	\$2,169

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$20,274	\$18,826
Tier 1/Tier 2 valuation payroll	92,487	90,036
Tier 1/Tier 2 pension normal cost rate	21.92%	20.91%
Tier 1/ Tier 2 Actuarial accrued liability	\$484,789	\$430,058
Actuarial asset value	424,023	382,453
Tier 1/Tier 2 Unfunded actuarial accrued liability	60,766	47,605
Tier 1/ Tier 2 Funded status	87%	89%
Combined valuation payroll	\$480,648	\$446,761
Tier 1/Tier 2 UAL as a percentage of payroll	13%	11%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	1.04%	(0.38%)
Tier 1/Tier 2 active members ¹	1	1
Tier 1/Tier 2 dormant members	0	0
Tier 1/Tier 2 retirees and beneficiaries	0	0

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	480,648	446,761
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$49,985	\$47,518
2. Employer reserves	374,038	334,935
3. Benefits in force reserve	0	0
4. Total market value of assets (1. + 2. + 3.)	\$424,023	\$382,453

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$382,453
2. Regular employer contributions	14,666
3. Benefit payments and expenses	0
4. Adjustments ¹	(1,390)
5. Interest credited	28,293
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$424,023

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	0	0
Tier 2 Police & Fire	20,274	18,826
Tier 2 General Service	0	0
Total	\$20,274	\$18,826

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$19,596	\$20,274	\$678

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	484,789	430,058
▪ Tier 2 General Service	0	0
▪ Total Active Members	\$484,789	\$430,058
Dormant Members	0	0
Retired Members and Beneficiaries	0	0
Total Actuarial Accrued Liability	\$484,789	\$430,058

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$472,135	\$484,789	\$12,654

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$484,789	\$430,058
2. Actuarial value of assets	424,023	382,453
3. Unfunded accrued liability (1. – 2.)	60,766	47,605
4. Funded percentage (2. ÷ 1.)	87%	89%
5. Combined valuation payroll	\$480,648	\$446,761
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	13%	11%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$16,746)	(\$1,302)	(\$1,204)	(\$16,648)	(\$1,319)
December 31, 2015	\$64,351	\$4,656	\$4,640	\$64,335	\$4,708
December 31, 2016	N/A	N/A	N/A	\$13,079	\$923
Total				\$60,766	\$4,312

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$430,058
b. Normal cost at December 31, 2015 (excluding assumed expenses)	17,955
c. Benefit payments during 2016	0
d. Interest at 7.50% to December 31, 2016	32,928
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	480,941
f. Change in actuarial accrued liability due to assumption, method, and plan changes	12,654
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	493,595
2. Actuarial accrued liability at December 31, 2016	484,789
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	8,806
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	382,453
b. Contributions for 2016 ¹	14,666
c. Benefit payments and expenses during 2016	0
d. Interest at 7.50% to December 31, 2016	29,234
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	426,353
5. Actuarial value of assets at December 31, 2016	424,023
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(2,331)
7. Total actuarial gain/(loss) (3. + 6.)	\$6,475

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$47,605
2. Expected increase	6,982
3. Liability (gain)/loss	(8,806)
4. Asset (gain)/loss	2,331
5. Change due to changes in assumptions, methods, and plan provisions	12,654
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$60,766

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	20,274	92,487	21.92%	18,826	90,036	20.91%
Tier 2 General Service	0	0	0.00%	0	0	0.00%
Total	\$20,274	\$92,487	21.92%	\$18,826	\$90,036	20.91%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$60,766	\$47,605
2. Next year's Tier 1/Tier 2 UAL payment	4,312	3,354
3. Combined valuation payroll	480,648	446,761
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	0.90%	0.75%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	21.92%	20.91%
b. Tier 1/Tier 2 UAL rate	0.90%	0.75%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	22.96%	21.81%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	20.53%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	20.53%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	4.11%
b. Preliminary size of rate collar (maximum of 3% or a.)	4.11%
c. Funded percentage	87%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	4.11%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	16.42%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	24.64%
7. Advisory July 1, 2019 total pension rate, before adjustment	22.96%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	0.00%
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	0.90%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	0.90%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	22.96%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	21.92%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	21.92%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	22.96%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	21.92%	20.91%
b. Tier 1/Tier 2 UAL rate	0.90%	(0.53%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	22.96%	20.53%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$0	\$0
Tier 2	0	92,487	92,487
Tier 1/Tier 2 valuation payroll	0	92,487	92,487
OPSRP valuation payroll	44,555	343,606	388,161
Combined valuation payroll	\$44,555	\$436,093	\$480,648

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	0	1	1	0	0	1	1
Police & Fire	0	1	6	7	0	1	6	7
Total	0	1	7	8	0	1	7	8
Active Members with previous service segments with the employer								
General Service	0	0	N/A	0	0	0	N/A	0
Police & Fire	0	1	N/A	1	0	1	N/A	1
Total	0	1	N/A	1	0	1	N/A	1
Dormant Members								
General Service	0	0	0	0	0	0	0	0
Police & Fire	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
Retired Members and Beneficiaries								
General Service	0	0	0	0	0	0	0	0
Police & Fire	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
Grand Total Number of Members	0	2	7	9	0	2	7	9

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49										
50-54										
55-59										
60-64				1						1
65-69										
70-74										
75+										
Total	0	0	0	1	0	0	0	0	0	1

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64		
40-44			65-69		
45-49			70-74		
50-54			75-79		
55-59			80-84		
60-64			85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total			Total		

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

Brownsville Rural Fire Protection District/2779
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
Brownsville Rural Fire Protection District/2779

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
Brownsville Rural Fire Protection District/2779

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

Brownsville Rural Fire Protection District -- #2779

November 2017

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Executive Summary

Milliman has prepared this report for Brownsville Rural Fire Protection District to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to Brownsville Rural Fire Protection District.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for Brownsville Rural Fire Protection District

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	20.62%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	(3.02%)	(3.02%)	(3.02%)
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	19.16%	7.03%	11.76%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	19.65%	7.45%	12.18%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 70%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	14.60%	14.60%
Minimum 2019-2021 Rate	11.60%	8.60%
Maximum 2019-2021 Rate	17.60%	20.60%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$334,703	\$375,388	\$40,685	89%	\$84,296	48%
12/31/2012	394,320	394,366	46	100%	82,896	0%
12/31/2013	463,170	409,045	(54,125)	113%	80,187	(67%)
12/31/2014	424,262	558,462	134,200	76%	87,726	153%
12/31/2015	425,260	591,506	166,246	72%	91,460	182%
12/31/2016	448,249	639,802	191,553	70%	91,569	209%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

Brownsville Rural Fire Protection District

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$191,553	\$166,246
Allocated pooled OPSRP UAL	15,765	13,002
Side account	0	0
Net unfunded pension actuarial accrued liability	207,318	179,248
Combined valuation payroll	91,569	91,460
Net pension UAL as a percentage of payroll	226%	196%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$12)	\$444

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$18,878	\$17,868
Tier 1/Tier 2 valuation payroll	91,569	91,460
Tier 1/Tier 2 pension normal cost rate	20.62%	19.54%
Tier 1/ Tier 2 Actuarial accrued liability	\$639,802	\$591,506
Actuarial asset value	448,249	425,260
Tier 1/Tier 2 Unfunded actuarial accrued liability	191,553	166,246
Tier 1/ Tier 2 Funded status	70%	72%
Combined valuation payroll	\$91,569	\$91,460
Tier 1/Tier 2 UAL as a percentage of payroll	209%	182%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	(3.02%)	(4.94%)
Tier 1/Tier 2 active members ¹	1	1
Tier 1/Tier 2 dormant members	0	0
Tier 1/Tier 2 retirees and beneficiaries	1	1

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	91,569	91,460
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$18,511	\$17,445
2. Employer reserves	291,488	261,939
3. Benefits in force reserve	138,250	145,877
4. Total market value of assets (1. + 2. + 3.)	\$448,249	\$425,260

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$425,260
2. Regular employer contributions	10,188
3. Benefit payments and expenses	(27,069)
4. Adjustments ¹	9,556
5. Interest credited	30,313
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$448,249

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	0	0
Tier 2 Police & Fire	18,878	17,868
Tier 2 General Service	0	0
Total	\$18,878	\$17,868

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$18,129	\$18,878	\$749

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	313,304	276,530
▪ Tier 2 General Service	0	0
▪ Total Active Members	\$313,304	\$276,530
Dormant Members	0	0
Retired Members and Beneficiaries	326,498	314,976
Total Actuarial Accrued Liability	\$639,802	\$591,506

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$619,145	\$639,802	\$20,657

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$639,802	\$591,506
2. Actuarial value of assets	448,249	425,260
3. Unfunded accrued liability (1. – 2.)	191,553	166,246
4. Funded percentage (2. ÷ 1.)	70%	72%
5. Combined valuation payroll	\$91,569	\$91,460
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	209%	182%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$54,083)	(\$4,205)	(\$3,888)	(\$53,766)	(\$4,261)
December 31, 2015	\$220,329	\$15,943	\$15,888	\$220,274	\$16,118
December 31, 2016	N/A	N/A	N/A	\$25,045	\$1,768
Total				\$191,553	\$13,625

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$591,506
b. Normal cost at December 31, 2015 (excluding assumed expenses)	17,041
c. Benefit payments during 2016	(26,841)
d. Interest at 7.50% to December 31, 2016	43,995
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	625,701
f. Change in actuarial accrued liability due to assumption, method, and plan changes	20,657
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	646,358
2. Actuarial accrued liability at December 31, 2016	639,802
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	6,556
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	425,260
b. Contributions for 2016 ¹	10,188
c. Benefit payments and expenses during 2016	(27,069)
d. Interest at 7.50% to December 31, 2016	31,262
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	439,641
5. Actuarial value of assets at December 31, 2016	448,249
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	8,607
7. Total actuarial gain/(loss) (3. + 6.)	\$15,163

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$166,246
2. Expected increase	19,813
3. Liability (gain)/loss	(6,556)
4. Asset (gain)/loss	(8,607)
5. Change due to changes in assumptions, methods, and plan provisions	20,657
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$191,553

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	18,878	91,569	20.62%	17,868	91,460	19.54%
Tier 2 General Service	0	0	0.00%	0	0	0.00%
Total	\$18,878	\$91,569	20.62%	\$17,868	\$91,460	19.54%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$191,553	\$166,246
2. Next year's Tier 1/Tier 2 UAL payment	13,625	11,738
3. Combined valuation payroll	91,569	91,460
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	14.88%	12.83%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	20.62%	19.54%
b. Tier 1/Tier 2 UAL rate	14.88%	12.83%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	35.64%	32.52%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	14.60%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	14.60%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	2.92%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.00%
c. Funded percentage	70%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.00%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	11.60%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	17.60%
7. Advisory July 1, 2019 total pension rate, before adjustment	35.64%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(18.04%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	14.88%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	(3.16%)
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	17.60%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	20.62%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	20.62%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	17.60%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	20.62%	19.54%
b. Tier 1/Tier 2 UAL rate	(3.16%)	(5.09%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	17.60%	14.60%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$0	\$0
Tier 2	0	91,569	91,569
Tier 1/Tier 2 valuation payroll	0	91,569	91,569
OPSRP valuation payroll	0	0	0
Combined valuation payroll	\$0	\$91,569	\$91,569

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	0	0	0	0	0	0	0
Police & Fire	0	1	0	1	0	1	0	1
Total	0	1	0	1	0	1	0	1
Active Members with previous service segments with the employer								
General Service	0	0	N/A	0	0	0	N/A	0
Police & Fire	0	0	N/A	0	0	0	N/A	0
Total	0	0	N/A	0	0	0	N/A	0
Dormant Members								
General Service	0	0	0	0	0	0	0	0
Police & Fire	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
Retired Members and Beneficiaries								
General Service	0	0	0	0	0	0	0	0
Police & Fire	1	0	0	1	1	0	0	1
Total	1	0	0	1	1	0	0	1
Grand Total Number of Members	1	1	0	2	1	1	0	2

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49										
50-54				1						1
55-59										
60-64										
65-69										
70-74										
75+										
Total	0	0	0	1	0	0	0	0	0	1

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64	1	1,715
40-44			65-69		
45-49			70-74		
50-54			75-79		
55-59			80-84		
60-64			85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total			Total	1	1,715

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

Central Oregon Regional Housing Authority/2678
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
Central Oregon Regional Housing Authority/2678

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
Central Oregon Regional Housing Authority/2678

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

Central Oregon Regional Housing Authority -- #2678

November 2017

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Executive Summary

Milliman has prepared this report for Central Oregon Regional Housing Authority to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to Central Oregon Regional Housing Authority.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for Central Oregon Regional Housing Authority

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	10.22%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	3.76%	3.76%	3.76%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	15.54%	13.81%	18.54%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	16.03%	14.23%	18.96%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 76%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	10.98%	10.98%
Minimum 2019-2021 Rate	7.98%	4.98%
Maximum 2019-2021 Rate	13.98%	16.98%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$1,912,749	\$1,768,115	(\$144,634)	108%	\$812,514	(18%)
12/31/2012	2,154,777	1,718,750	(436,027)	125%	738,745	(59%)
12/31/2013	2,099,560	1,894,256	(205,304)	111%	727,584	(28%)
12/31/2014	2,167,404	2,217,679	50,275	98%	859,032	6%
12/31/2015	2,101,985	2,427,624	325,639	87%	985,333	33%
12/31/2016	2,033,244	2,668,624	635,380	76%	1,114,284	57%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

Central Oregon Regional Housing Authority

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$635,380	\$325,639
Allocated pooled OPSRP UAL	191,838	140,079
Side account	0	0
Net unfunded pension actuarial accrued liability	827,218	465,718
Combined valuation payroll	1,114,284	985,333
Net pension UAL as a percentage of payroll	74%	47%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$152)	\$4,784

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$22,172	\$19,926
Tier 1/Tier 2 valuation payroll	216,994	202,101
Tier 1/Tier 2 pension normal cost rate	10.22%	9.86%
Tier 1/ Tier 2 Actuarial accrued liability	\$2,668,624	\$2,427,624
Actuarial asset value	2,033,244	2,101,985
Tier 1/Tier 2 Unfunded actuarial accrued liability	635,380	325,639
Tier 1/ Tier 2 Funded status	76%	87%
Combined valuation payroll	\$1,114,284	\$985,333
Tier 1/Tier 2 UAL as a percentage of payroll	57%	33%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	3.76%	1.12%
Tier 1/Tier 2 active members ¹	2	2
Tier 1/Tier 2 dormant members	6	6
Tier 1/Tier 2 retirees and beneficiaries	12	10

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	1,114,284	985,333
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$162,880	\$277,798
2. Employer reserves	1,103,735	1,157,392
3. Benefits in force reserve	766,629	666,796
4. Total market value of assets (1. + 2. + 3.)	\$2,033,244	\$2,101,985

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$2,101,985
2. Regular employer contributions	2,296
3. Benefit payments and expenses	(150,102)
4. Adjustments ¹	(64,305)
5. Interest credited	143,370
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$2,033,244

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	9,924	8,682
Tier 2 Police & Fire	0	0
Tier 2 General Service	12,248	11,244
Total	\$22,172	\$19,926

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$21,825	\$22,172	\$347

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	365,147	528,014
▪ Tier 2 Police & Fire	0	0
▪ Tier 2 General Service	395,803	365,214
▪ Total Active Members	\$760,950	\$893,228
Dormant Members	97,166	94,656
Retired Members and Beneficiaries	1,810,508	1,439,740
Total Actuarial Accrued Liability	\$2,668,624	\$2,427,624

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$2,638,601	\$2,668,624	\$30,023

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$2,668,624	\$2,427,624
2. Actuarial value of assets	2,033,244	2,101,985
3. Unfunded accrued liability (1. – 2.)	635,380	325,639
4. Funded percentage (2. ÷ 1.)	76%	87%
5. Combined valuation payroll	\$1,114,284	\$985,333
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	57%	33%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$205,146)	(\$15,951)	(\$14,749)	(\$203,944)	(\$16,163)
December 31, 2015	\$530,785	\$38,407	\$38,274	\$530,652	\$38,830
December 31, 2016	N/A	N/A	N/A	\$308,672	\$21,794
Total				\$635,380	\$44,461

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$2,427,624
b. Normal cost at December 31, 2015 (excluding assumed expenses)	19,004
c. Benefit payments during 2016	(148,840)
d. Interest at 7.50% to December 31, 2016	177,203
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	2,474,991
f. Change in actuarial accrued liability due to assumption, method, and plan changes	30,023
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	2,505,014
2. Actuarial accrued liability at December 31, 2016	2,668,624
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(163,610)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	2,101,985
b. Contributions for 2016 ¹	2,296
c. Benefit payments and expenses during 2016	(150,102)
d. Interest at 7.50% to December 31, 2016	152,106
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	2,106,285
5. Actuarial value of assets at December 31, 2016	2,033,244
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(73,042)
7. Total actuarial gain/(loss) (3. + 6.)	(\$236,652)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$325,639
2. Expected increase	43,066
3. Liability (gain)/loss	163,610
4. Asset (gain)/loss	73,042
5. Change due to changes in assumptions, methods, and plan provisions	30,023
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$635,380

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	9,924	103,849	9.56%	8,682	98,258	8.84%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	12,248	113,145	10.83%	11,244	103,843	10.83%
Total	\$22,172	\$216,994	10.22%	\$19,926	\$202,101	9.86%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$635,380	\$325,639
2. Next year's Tier 1/Tier 2 UAL payment	44,461	22,456
3. Combined valuation payroll	1,114,284	985,333
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	3.99%	2.28%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	10.22%	9.86%
b. Tier 1/Tier 2 UAL rate	3.99%	2.28%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	14.35%	12.29%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	10.98%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	10.98%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	2.20%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.00%
c. Funded percentage	76%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.00%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	7.98%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	13.98%
7. Advisory July 1, 2019 total pension rate, before adjustment	14.35%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(0.37%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	3.99%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	3.62%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	13.98%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	10.22%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	10.22%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	13.98%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	10.22%	9.86%
b. Tier 1/Tier 2 UAL rate	3.62%	0.97%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	13.98%	10.98%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$103,849	\$0	\$103,849
Tier 2	113,145	0	113,145
Tier 1/Tier 2 valuation payroll	216,994	0	216,994
OPSRP valuation payroll	897,290	0	897,290
Combined valuation payroll	\$1,114,284	\$0	\$1,114,284

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	1	1	14	16	1	1	12	14
Police & Fire	0	0	0	0	0	0	0	0
Total	1	1	14	16	1	1	12	14
Active Members with previous service segments with the employer								
General Service	2	4	N/A	6	4	4	N/A	8
Police & Fire	0	0	N/A	0	0	0	N/A	0
Total	2	4	N/A	6	4	4	N/A	8
Dormant Members								
General Service	3	3	2	8	3	3	2	8
Police & Fire	0	0	0	0	0	0	0	0
Total	3	3	2	8	3	3	2	8
Retired Members and Beneficiaries								
General Service	9	3	0	12	7	3	0	10
Police & Fire	0	0	0	0	0	0	0	0
Total	9	3	0	12	7	3	0	10
Grand Total Number of Members	15	11	16	42	15	11	14	40

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44				1						1
45-49										
50-54										
55-59			1							1
60-64										
65-69										
70-74										
75+										
Total	0	0	1	1	0	0	0	0	0	2

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59	1	262
35-39			60-64	4	1,891
40-44			65-69	3	483
45-49	1	0	70-74	1	317
50-54	2	47	75-79	3	152
55-59			80-84		
60-64	1	419	85-89		
65-69	1	57	90-94		
70-74			95-99		
75+	1	609	100+		
Total	6	197	Total	12	837

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

Chiloquin Agency Lake Rural Fire Protection District/2645
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017

Chiloquin Agency Lake Rural Fire Protection District/2645

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
Chiloquin Agency Lake Rural Fire Protection District/2645

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

Chiloquin Agency Lake Rural Fire Protection District -- #2645

November 2017

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Executive Summary

Milliman has prepared this report for Chiloquin Agency Lake Rural Fire Protection District to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to Chiloquin Agency Lake Rural Fire Protection District.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for Chiloquin Agency Lake Rural Fire Protection District

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	18.36%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	4.62%	4.62%	4.62%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	24.54%	14.67%	19.40%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	25.03%	15.09%	19.82%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 64%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	17.41%	17.41%
Minimum 2019-2021 Rate	13.93%	10.45%
Maximum 2019-2021 Rate	20.89%	24.37%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$279,554	\$332,887	\$53,333	84%	\$94,119	57%
12/31/2012	334,249	359,616	25,367	93%	98,398	26%
12/31/2013	396,856	391,591	(5,265)	101%	99,051	(5%)
12/31/2014	332,916	461,228	128,312	72%	32,170	399%
12/31/2015	323,028	479,440	156,412	67%	78,010	201%
12/31/2016	335,602	525,937	190,335	64%	93,438	204%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

Chiloquin Agency Lake Rural Fire Protection District

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$190,335	\$156,412
Allocated pooled OPSRP UAL	16,086	11,090
Side account	0	0
Net unfunded pension actuarial accrued liability	206,421	167,502
Combined valuation payroll	93,438	78,010
Net pension UAL as a percentage of payroll	221%	215%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$13)	\$379

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$17,154	\$15,148
Tier 1/Tier 2 valuation payroll	93,438	78,010
Tier 1/Tier 2 pension normal cost rate	18.36%	19.42%
Tier 1/ Tier 2 Actuarial accrued liability	\$525,937	\$479,440
Actuarial asset value	335,602	323,028
Tier 1/Tier 2 Unfunded actuarial accrued liability	190,335	156,412
Tier 1/ Tier 2 Funded status	64%	67%
Combined valuation payroll	\$93,438	\$78,010
Tier 1/Tier 2 UAL as a percentage of payroll	204%	201%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	4.62%	(2.01%)
Tier 1/Tier 2 active members ¹	2	2
Tier 1/Tier 2 dormant members	1	1
Tier 1/Tier 2 retirees and beneficiaries	2	2

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	93,438	78,010
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$12,586	\$11,925
2. Employer reserves	145,332	123,672
3. Benefits in force reserve	177,684	187,431
4. Total market value of assets (1. + 2. + 3.)	\$335,602	\$323,028

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$323,028
2. Regular employer contributions	12,052
3. Benefit payments and expenses	(34,790)
4. Adjustments ¹	12,516
5. Interest credited	22,795
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$335,602

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$13,795	\$11,927
Tier 1 General Service	0	0
Tier 2 Police & Fire	0	0
Tier 2 General Service	3,359	3,221
Total	\$17,154	\$15,148

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$16,558	\$17,154	\$596

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$30,198	\$11,374
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	0	0
▪ Tier 2 General Service	44,923	33,670
▪ Total Active Members	\$75,121	\$45,044
Dormant Members	31,188	29,696
Retired Members and Beneficiaries	419,628	404,700
Total Actuarial Accrued Liability	\$525,937	\$479,440

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$506,754	\$525,937	\$19,183

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$525,937	\$479,440
2. Actuarial value of assets	335,602	323,028
3. Unfunded accrued liability (1. – 2.)	190,335	156,412
4. Funded percentage (2. ÷ 1.)	64%	67%
5. Combined valuation payroll	\$93,438	\$78,010
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	204%	201%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$5,261)	(\$409)	(\$378)	(\$5,230)	(\$414)
December 31, 2015	\$161,673	\$11,698	\$11,658	\$161,633	\$11,827
December 31, 2016	N/A	N/A	N/A	\$33,932	\$2,396
Total				\$190,335	\$13,809

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$479,440
b. Normal cost at December 31, 2015 (excluding assumed expenses)	14,447
c. Benefit payments during 2016	(34,497)
d. Interest at 7.50% to December 31, 2016	35,206
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	494,596
f. Change in actuarial accrued liability due to assumption, method, and plan changes	19,183
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	513,779
2. Actuarial accrued liability at December 31, 2016	525,937
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(12,158)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	323,028
b. Contributions for 2016 ¹	12,052
c. Benefit payments and expenses during 2016	(34,790)
d. Interest at 7.50% to December 31, 2016	23,374
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	323,665
5. Actuarial value of assets at December 31, 2016	335,602
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	11,937
7. Total actuarial gain/(loss) (3. + 6.)	(\$221)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$156,412
2. Expected increase	14,519
3. Liability (gain)/loss	12,158
4. Asset (gain)/loss	(11,937)
5. Change due to changes in assumptions, methods, and plan provisions	19,183
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$190,335

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$13,795	\$60,444	22.82%	\$11,927	\$45,425	26.26%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	3,359	32,994	10.18%	3,221	32,585	9.88%
Total	\$17,154	\$93,438	18.36%	\$15,148	\$78,010	19.42%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$190,335	\$156,412
2. Next year's Tier 1/Tier 2 UAL payment	13,809	11,289
3. Combined valuation payroll	93,438	78,010
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	14.78%	14.47%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	18.36%	19.42%
b. Tier 1/Tier 2 UAL rate	14.78%	14.47%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	33.28%	34.04%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	17.41%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	17.41%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.48%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.48%
c. Funded percentage	64%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	5.57%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	11.84%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	22.98%
7. Advisory July 1, 2019 total pension rate, before adjustment	33.28%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(10.30%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	14.78%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	4.48%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	22.98%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	18.36%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	18.36%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	22.98%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	18.36%	19.42%
b. Tier 1/Tier 2 UAL rate	4.48%	(2.16%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	22.98%	17.41%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$60,444	\$60,444
Tier 2	32,994	0	32,994
Tier 1/Tier 2 valuation payroll	32,994	60,444	93,438
OPSRP valuation payroll	0	0	0
Combined valuation payroll	\$32,994	\$60,444	\$93,438

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	1	0	1	0	1	0	1
Police & Fire	1	0	0	1	1	0	0	1
Total	1	1	0	2	1	1	0	2
Active Members with previous service segments with the employer								
General Service	0	0	N/A	0	0	0	N/A	0
Police & Fire	0	0	N/A	0	0	0	N/A	0
Total	0	0	N/A	0	0	0	N/A	0
Dormant Members								
General Service	0	0	0	0	0	0	0	0
Police & Fire	1	0	0	1	1	0	0	1
Total	1	0	0	1	1	0	0	1
Retired Members and Beneficiaries								
General Service	1	0	0	1	1	0	0	1
Police & Fire	1	0	0	1	1	0	0	1
Total	2	0	0	2	2	0	0	2
Grand Total Number of Members	4	1	0	5	4	1	0	5

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39				1						1
40-44										
45-49										
50-54					1					1
55-59										
60-64										
65-69										
70-74										
75+										
Total	0	0	0	1	1	0	0	0	0	2

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64	2	1,068
40-44			65-69		
45-49			70-74		
50-54			75-79		
55-59			80-84		
60-64	1	190	85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total	1	190	Total	2	1,068

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called "funding method," a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Athena/2167
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Athena/2167

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Athena/2167

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Athena -- #2167

November 2017

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Executive Summary

Milliman has prepared this report for City of Athena to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Athena.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Athena

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	10.19%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	2.19%	2.19%	2.19%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	13.94%	12.24%	16.97%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	14.43%	12.66%	17.39%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 85%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	9.38%	9.38%
Minimum 2019-2021 Rate	6.38%	3.38%
Maximum 2019-2021 Rate	12.38%	15.38%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$1,296,055	\$1,269,742	(\$26,313)	102%	\$272,640	(10%)
12/31/2012	1,436,547	1,326,518	(110,029)	108%	338,455	(33%)
12/31/2013	1,616,907	1,412,565	(204,342)	114%	349,824	(58%)
12/31/2014	1,685,442	1,690,436	4,994	100%	309,517	2%
12/31/2015	1,502,601	1,852,973	350,372	81%	264,259	133%
12/31/2016	1,651,512	1,954,310	302,798	85%	274,856	110%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Athena

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$302,798	\$350,372
Allocated pooled OPSRP UAL	47,320	37,568
Side account	0	0
Net unfunded pension actuarial accrued liability	350,118	387,940
Combined valuation payroll	274,856	264,259
Net pension UAL as a percentage of payroll	127%	147%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$37)	\$1,283

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$15,526	\$15,180
Tier 1/Tier 2 valuation payroll	152,326	149,151
Tier 1/Tier 2 pension normal cost rate	10.19%	10.18%
Tier 1/ Tier 2 Actuarial accrued liability	\$1,954,310	\$1,852,973
Actuarial asset value	1,651,512	1,502,601
Tier 1/Tier 2 Unfunded actuarial accrued liability	302,798	350,372
Tier 1/ Tier 2 Funded status	85%	81%
Combined valuation payroll	\$274,856	\$264,259
Tier 1/Tier 2 UAL as a percentage of payroll	110%	133%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	2.19%	(0.80%)
Tier 1/Tier 2 active members ¹	3	3
Tier 1/Tier 2 dormant members	3	3
Tier 1/Tier 2 retirees and beneficiaries	5	5

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	274,856	264,259
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$130,305	\$123,577
2. Employer reserves	1,023,312	850,276
3. Benefits in force reserve	497,895	528,749
4. Total market value of assets (1. + 2. + 3.)	\$1,651,512	\$1,502,601

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$1,502,601
2. Regular employer contributions	4,612
3. Benefit payments and expenses	(97,485)
4. Adjustments ¹	129,756
5. Interest credited	112,028
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$1,651,512

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$956
Tier 1 General Service	4,296	4,108
Tier 2 Police & Fire	0	0
Tier 2 General Service	11,230	10,116
Total	\$15,526	\$15,180

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$15,236	\$15,526	\$290

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$148,609	\$152,509
▪ Tier 1 General Service	123,411	104,376
▪ Tier 2 Police & Fire	29,156	26,126
▪ Tier 2 General Service	264,905	229,298
▪ Total Active Members	\$566,081	\$512,309
Dormant Members	212,377	198,995
Retired Members and Beneficiaries	1,175,852	1,141,669
Total Actuarial Accrued Liability	\$1,954,310	\$1,852,973

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$1,907,921	\$1,954,310	\$46,389

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$1,954,310	\$1,852,973
2. Actuarial value of assets	1,651,512	1,502,601
3. Unfunded accrued liability (1. – 2.)	302,798	350,372
4. Funded percentage (2. ÷ 1.)	85%	81%
5. Combined valuation payroll	\$274,856	\$264,259
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	110%	133%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$204,185)	(\$15,876)	(\$14,680)	(\$202,989)	(\$16,087)
December 31, 2015	\$554,557	\$40,127	\$39,989	\$554,419	\$40,569
December 31, 2016	N/A	N/A	N/A	(\$48,632)	(\$3,434)
Total				\$302,798	\$21,048

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$1,852,973
b. Normal cost at December 31, 2015 (excluding assumed expenses)	14,522
c. Benefit payments during 2016	(96,665)
d. Interest at 7.50% to December 31, 2016	135,893
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	1,906,723
f. Change in actuarial accrued liability due to assumption, method, and plan changes	46,389
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	1,953,112
2. Actuarial accrued liability at December 31, 2016	1,954,310
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(1,198)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	1,502,601
b. Contributions for 2016 ¹	4,612
c. Benefit payments and expenses during 2016	(97,485)
d. Interest at 7.50% to December 31, 2016	109,212
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	1,518,941
5. Actuarial value of assets at December 31, 2016	1,651,512
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	132,571
7. Total actuarial gain/(loss) (3. + 6.)	\$131,373

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$350,372
2. Expected increase	37,410
3. Liability (gain)/loss	1,198
4. Asset (gain)/loss	(132,571)
5. Change due to changes in assumptions, methods, and plan provisions	46,389
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$302,798

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$956	\$6,598	14.49%
Tier 1 General Service	4,296	35,642	12.05%	4,108	35,432	11.59%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	11,230	116,684	9.62%	10,116	107,121	9.44%
Total	\$15,526	\$152,326	10.19%	\$15,180	\$149,151	10.18%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$302,798	\$350,372
2. Next year's Tier 1/Tier 2 UAL payment	21,048	24,251
3. Combined valuation payroll	274,856	264,259
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	7.66%	9.18%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	10.19%	10.18%
b. Tier 1/Tier 2 UAL rate	7.66%	9.18%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	17.99%	19.51%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	9.38%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	9.38%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	1.88%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.00%
c. Funded percentage	85%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.00%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	6.38%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	12.38%
7. Advisory July 1, 2019 total pension rate, before adjustment	17.99%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(5.61%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	7.66%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	2.05%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	12.38%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	10.19%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	10.19%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	12.38%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	10.19%	10.18%
b. Tier 1/Tier 2 UAL rate	2.05%	(0.95%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	12.38%	9.38%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$35,642	\$0	\$35,642
Tier 2	116,684	0	116,684
Tier 1/Tier 2 valuation payroll	152,326	0	152,326
OPSRP valuation payroll	122,530	0	122,530
Combined valuation payroll	\$274,856	\$0	\$274,856

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	1	2	2	5	1	2	2	5
Police & Fire	0	0	0	0	0	0	0	0
Total	1	2	2	5	1	2	2	5
Active Members with previous service segments with the employer								
General Service	0	1	N/A	1	0	1	N/A	1
Police & Fire	2	1	N/A	3	2	1	N/A	3
Total	2	2	N/A	4	2	2	N/A	4
Dormant Members								
General Service	1	2	1	4	1	2	1	4
Police & Fire	0	0	0	0	0	0	0	0
Total	1	2	1	4	1	2	1	4
Retired Members and Beneficiaries								
General Service	2	0	0	2	2	0	0	2
Police & Fire	2	1	0	3	2	1	0	3
Total	4	1	0	5	4	1	0	5
Grand Total Number of Members	8	7	3	18	8	7	3	18

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44				1						1
45-49										
50-54			1							1
55-59										
60-64					1					1
65-69										
70-74										
75+										
Total	0	0	1	1	1	0	0	0	0	3

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64	2	738
40-44			65-69	1	3,642
45-49	1	1,634	70-74	1	1,481
50-54			75-79		
55-59	1	374	80-84		
60-64			85-89	1	391
65-69			90-94		
70-74			95-99		
75+	1	90	100+		
Total	3	699	Total	5	1,398

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Beaverton/2106
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Beaverton/2106

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Beaverton/2106

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Beaverton -- #2106

November 2017

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Executive Summary

Milliman has prepared this report for City of Beaverton to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Beaverton.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Beaverton

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	17.25%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	3.02%	3.02%	3.02%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	21.83%	13.07%	17.80%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	22.32%	13.49%	18.22%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 69%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	16.62%	16.62%
Minimum 2019-2021 Rate	13.30%	9.98%
Maximum 2019-2021 Rate	19.94%	23.26%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$146,862,259	\$181,185,933	\$34,323,674	81%	\$32,648,286	105%
12/31/2012	159,589,702	181,388,229	21,798,527	88%	34,468,039	63%
12/31/2013	174,455,205	191,831,494	17,376,289	91%	36,355,074	48%
12/31/2014	179,125,005	228,148,252	49,023,247	79%	36,862,844	133%
12/31/2015	172,778,254	240,245,999	67,467,745	72%	38,014,220	177%
12/31/2016	176,837,903	256,068,508	79,230,605	69%	40,217,514	197%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Beaverton

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$79,230,605	\$67,467,745
Allocated pooled OPSRP UAL	6,923,935	5,404,251
Side account	0	0
Net unfunded pension actuarial accrued liability	86,154,540	72,871,996
Combined valuation payroll	40,217,514	38,014,220
Net pension UAL as a percentage of payroll	214%	192%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$5,476)	\$184,584

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer’s combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$3,409,836	\$3,337,008
Tier 1/Tier 2 valuation payroll	19,769,825	20,081,698
Tier 1/Tier 2 pension normal cost rate	17.25%	16.62%
Tier 1/ Tier 2 Actuarial accrued liability	\$256,068,508	\$240,245,999
Actuarial asset value	176,837,903	172,778,254
Tier 1/Tier 2 Unfunded actuarial accrued liability	79,230,605	67,467,745
Tier 1/ Tier 2 Funded status	69%	72%
Combined valuation payroll	\$40,217,514	\$38,014,220
Tier 1/Tier 2 UAL as a percentage of payroll	197%	177%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	3.02%	0.00%
Tier 1/Tier 2 active members ¹	232	241
Tier 1/Tier 2 dormant members	124	126
Tier 1/Tier 2 retirees and beneficiaries	465	451

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	40,217,514	38,014,220
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$22,625,155	\$22,434,005
2. Employer reserves	89,759,535	83,290,568
3. Benefits in force reserve	64,453,212	67,053,681
4. Total market value of assets (1. + 2. + 3.)	\$176,837,903	\$172,778,254

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$172,778,254
2. Regular employer contributions	2,567,628
3. Benefit payments and expenses	(12,619,619)
4. Adjustments ¹	2,036,677
5. Interest credited	12,074,963
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$176,837,903

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$590,123	\$556,892
Tier 1 General Service	1,001,755	1,004,354
Tier 2 Police & Fire	882,431	842,438
Tier 2 General Service	935,527	933,324
Total	\$3,409,836	\$3,337,008

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$3,327,261	\$3,409,836	\$82,575

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$18,362,899	\$17,158,702
▪ Tier 1 General Service	31,246,015	30,052,921
▪ Tier 2 Police & Fire	16,371,928	14,640,770
▪ Tier 2 General Service	21,280,785	19,593,269
▪ Total Active Members	\$87,261,627	\$81,445,662
Dormant Members	16,590,976	14,018,600
Retired Members and Beneficiaries	152,215,905	144,781,737
Total Actuarial Accrued Liability	\$256,068,508	\$240,245,999

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$249,534,511	\$256,068,508	\$6,533,997

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$256,068,508	\$240,245,999
2. Actuarial value of assets	176,837,903	172,778,254
3. Unfunded accrued liability (1. – 2.)	79,230,605	67,467,745
4. Funded percentage (2. ÷ 1.)	69%	72%
5. Combined valuation payroll	\$40,217,514	\$38,014,220
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	197%	177%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$17,362,884	\$1,350,042	\$1,248,281	\$17,261,123	\$1,367,976
December 31, 2015	\$50,104,861	\$3,625,533	\$3,613,021	\$50,092,349	\$3,665,473
December 31, 2016	N/A	N/A	N/A	\$11,877,133	\$838,603
Total				\$79,230,605	\$5,872,052

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$240,245,999
b. Normal cost at December 31, 2015 (excluding assumed expenses)	3,182,380
c. Benefit payments during 2016	(12,513,497)
d. Interest at 7.50% to December 31, 2016	17,668,533
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	248,583,415
f. Change in actuarial accrued liability due to assumption, method, and plan changes	6,533,997
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	255,117,412
2. Actuarial accrued liability at December 31, 2016	256,068,508
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(951,096)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	172,778,254
b. Contributions for 2016 ¹	2,567,628
c. Benefit payments and expenses during 2016	(12,619,619)
d. Interest at 7.50% to December 31, 2016	12,581,419
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	175,307,683
5. Actuarial value of assets at December 31, 2016	176,837,903
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	1,530,220
7. Total actuarial gain/(loss) (3. + 6.)	\$579,124

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$67,467,745
2. Expected increase	5,807,987
3. Liability (gain)/loss	951,096
4. Asset (gain)/loss	(1,530,220)
5. Change due to changes in assumptions, methods, and plan provisions	6,533,997
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$79,230,605

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$590,123	\$2,635,216	22.39%	\$556,892	\$2,630,057	21.17%
Tier 1 General Service	1,001,755	5,548,358	18.05%	1,004,354	5,741,233	17.49%
Tier 2 Police & Fire	882,431	4,496,512	19.62%	842,438	4,494,038	18.75%
Tier 2 General Service	935,527	7,089,739	13.20%	933,324	7,216,370	12.93%
Total	\$3,409,836	\$19,769,825	17.25%	\$3,337,008	\$20,081,698	16.62%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$79,230,605	\$67,467,745
2. Next year's Tier 1/Tier 2 UAL payment	5,872,052	4,975,575
3. Combined valuation payroll	40,217,514	38,014,220
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	14.60%	13.09%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.25%	16.62%
b. Tier 1/Tier 2 UAL rate	14.60%	13.09%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	31.99%	29.86%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	16.62%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	16.62%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.32%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.32%
c. Funded percentage	69%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.65%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	12.97%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	20.27%
7. Advisory July 1, 2019 total pension rate, before adjustment	31.99%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(11.72%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	14.60%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	2.88%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	20.27%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	17.25%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	17.25%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	20.27%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.25%	16.62%
b. Tier 1/Tier 2 UAL rate	2.88%	(0.15%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	20.27%	16.62%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$5,548,358	\$2,635,216	\$8,183,574
Tier 2	7,089,739	4,496,512	11,586,251
Tier 1/Tier 2 valuation payroll	12,638,097	7,131,728	19,769,825
OPSRP valuation payroll	13,889,370	6,558,319	20,447,689
Combined valuation payroll	\$26,527,467	\$13,690,047	\$40,217,514

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	69	98	240	407	72	103	211	386
Police & Fire	23	42	73	138	23	43	69	135
Total	92	140	313	545	95	146	280	521
Active Members with previous service segments with the employer								
General Service	57	53	N/A	110	58	49	N/A	107
Police & Fire	7	8	N/A	15	8	9	N/A	17
Total	64	61	N/A	125	66	58	N/A	124
Dormant Members								
General Service	49	52	34	135	51	54	29	134
Police & Fire	15	8	5	28	15	6	4	25
Total	64	60	39	163	66	60	33	159
Retired Members and Beneficiaries								
General Service	285	55	9	349	274	53	6	333
Police & Fire	123	2	0	125	117	7	0	124
Total	408	57	9	474	391	60	6	457
Grand Total Number of Members	628	318	361	1,307	618	324	319	1,261

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34		1	2							3
35-39		1	8	5						14
40-44		1	7	23	2					33
45-49			10	16	17	5				48
50-54		2	5	13	11	12	2			45
55-59			5	22	5	5	7			44
60-64		1	5	9	8	6	2	1		32
65-69			2	2	5	2				11
70-74			1	1						2
75+										
Total	0	6	45	91	48	30	11	1	0	232

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45	2	1,189
20-24			45-49		
25-29			50-54	9	1,507
30-34			55-59	41	2,525
35-39	2	49	60-64	91	2,771
40-44	14	751	65-69	121	2,092
45-49	20	821	70-74	96	1,795
50-54	27	1,155	75-79	58	1,683
55-59	27	1,361	80-84	26	1,650
60-64	22	885	85-89	14	784
65-69	10	1,337	90-94	5	1,239
70-74	1	292	95-99	2	223
75+	1	911	100+		
Total	124	1,040	Total	465	2,054

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Bend/2107
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Bend/2107

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Bend/2107

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Bend -- #2107

November 2017

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Executive Summary

Milliman has prepared this report for City of Bend to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Bend.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Bend

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	17.24%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	9.81%	9.81%	9.81%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	(2.64%)	(2.64%)	(2.64%)
Net pension contribution rate	25.97%	17.22%	21.95%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	26.46%	17.64%	22.37%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 68%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	21.82%	21.82%
Minimum 2019-2021 Rate	17.46%	13.10%
Maximum 2019-2021 Rate	26.18%	30.54%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$113,904,241	\$132,422,315	\$18,518,073	86%	\$31,464,101	59%
12/31/2012	126,057,712	137,537,729	11,480,017	92%	32,558,682	35%
12/31/2013	139,836,995	144,653,986	4,816,991	97%	33,233,981	14%
12/31/2014	145,924,722	175,293,189	29,368,467	83%	36,868,563	80%
12/31/2015	142,207,014	187,768,848	45,561,834	76%	41,835,451	109%
12/31/2016	147,060,893	200,536,267	53,475,374	73%	44,716,224	120%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Bend

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$64,102,269	\$56,921,816
Allocated pooled OPSRP UAL	7,698,443	5,947,493
Side account	10,626,894	11,359,982
Net unfunded pension actuarial accrued liability	61,173,818	51,509,327
Combined valuation payroll	44,716,224	41,835,451
Net pension UAL as a percentage of payroll	137%	123%
Calculated side account rate relief	(2.64%)	(2.86%)
Allocated pooled RHIA UAL	(\$6,089)	\$203,139

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer’s combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$3,358,144	\$3,358,432
Tier 1/Tier 2 valuation payroll	19,478,744	20,288,321
Tier 1/Tier 2 pension normal cost rate	17.24%	16.55%
Tier 1/ Tier 2 Actuarial accrued liability	\$200,536,267	\$187,768,848
Actuarial asset value	136,433,998	130,847,032
Tier 1/Tier 2 Unfunded actuarial accrued liability	64,102,269	56,921,816
Tier 1/ Tier 2 Funded status	68%	70%
Combined valuation payroll	\$44,716,224	\$41,835,451
Tier 1/Tier 2 UAL as a percentage of payroll	143%	136%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	9.81%	5.27%
Tier 1/Tier 2 active members ¹	203	215
Tier 1/Tier 2 dormant members	82	72
Tier 1/Tier 2 retirees and beneficiaries	284	276

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A	\$11,359,982	\$11,359,982
2. Deposits made during 2016		N/A	
3. Administrative expenses		(1,000)	(1,000)
4. Amount transferred to employer reserves during 2016		(1,496,702)	(1,496,702)
5. Side account earnings during 2016		764,615	764,615
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)		\$10,626,894	\$10,626,894

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$10,626,894	\$11,359,982
Side account 2	0	0
Side account 3	0	0
Total	\$10,626,894	\$11,359,982

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$10,626,894	\$11,359,982
2. Combined valuation payroll	44,716,224	41,835,451
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	(2.64%)	(2.86%)

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$14,332,242	\$14,034,576
2. Employer reserves	75,624,706	68,408,419
3. Benefits in force reserve	46,477,050	48,404,037
4. Total market value of assets (1. + 2. + 3.)	\$136,433,998	\$130,847,032

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$130,847,032
2. Regular employer contributions	3,000,287
3. Benefit payments and expenses	(9,099,976)
4. Adjustments ¹	858,948
5. Interest credited	9,331,005
6. Total transferred from side accounts	1,496,702
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$136,433,998

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$971,711	\$935,955
Tier 1 General Service	439,343	492,521
Tier 2 Police & Fire	1,277,717	1,207,759
Tier 2 General Service	669,373	722,197
Total	\$3,358,144	\$3,358,432

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$3,256,329	\$3,358,144	\$101,815

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$30,581,859	\$28,277,343
▪ Tier 1 General Service	11,601,865	11,446,826
▪ Tier 2 Police & Fire	21,657,099	18,655,499
▪ Tier 2 General Service	13,961,481	13,617,437
▪ Total Active Members	\$77,802,304	\$71,997,105
Dormant Members	12,971,455	11,258,158
Retired Members and Beneficiaries	109,762,508	104,513,585
Total Actuarial Accrued Liability	\$200,536,267	\$187,768,848

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$194,625,262	\$200,536,267	\$5,911,005

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$200,536,267	\$187,768,848
2. Actuarial value of assets	136,433,998	130,847,032
3. Unfunded accrued liability (1. – 2.)	64,102,269	56,921,816
4. Funded percentage (2. ÷ 1.)	68%	70%
5. Combined valuation payroll	\$44,716,224	\$41,835,451
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	143%	136%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$17,387,837	\$1,351,982	\$1,250,075	\$17,285,930	\$1,369,942
December 31, 2015	\$39,533,979	\$2,860,635	\$2,850,763	\$39,524,107	\$2,892,149
December 31, 2016	N/A	N/A	N/A	\$7,292,232	\$514,879
Total				\$64,102,269	\$4,776,970

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$187,768,848
b. Normal cost at December 31, 2015 (excluding assumed expenses)	3,203,097
c. Benefit payments during 2016	(9,023,451)
d. Interest at 7.50% to December 31, 2016	13,864,400
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	195,812,894
f. Change in actuarial accrued liability due to assumption, method, and plan changes	5,911,005
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	201,723,899
2. Actuarial accrued liability at December 31, 2016	200,536,267
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	1,187,632
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	130,847,032
b. Contributions for 2016 ¹	4,496,989
c. Benefit payments and expenses during 2016	(9,099,976)
d. Interest at 7.50% to December 31, 2016	9,640,915
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	135,884,961
5. Actuarial value of assets at December 31, 2016	136,433,998
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	549,038
7. Total actuarial gain/(loss) (3. + 6.)	\$1,736,670

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$56,921,816
2. Expected increase	3,006,118
3. Liability (gain)/loss	(1,187,632)
4. Asset (gain)/loss	(549,038)
5. Change due to changes in assumptions, methods, and plan provisions	5,911,005
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$64,102,269

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$971,711	\$4,300,075	22.60%	\$935,955	\$4,402,095	21.26%
Tier 1 General Service	439,343	2,830,774	15.52%	492,521	3,208,635	15.35%
Tier 2 Police & Fire	1,277,717	6,696,656	19.08%	1,207,759	6,589,834	18.33%
Tier 2 General Service	669,373	5,651,239	11.84%	722,197	6,087,757	11.86%
Total	\$3,358,144	\$19,478,744	17.24%	\$3,358,432	\$20,288,321	16.55%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$64,102,269	\$56,921,816
2. Next year's Tier 1/Tier 2 UAL payment	4,776,970	4,212,617
3. Combined valuation payroll	44,716,224	41,835,451
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	10.68%	10.07%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.24%	16.55%
b. Tier 1/Tier 2 UAL rate	10.68%	10.07%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	28.06%	26.77%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	18.96%
2. Employer contribution rate attributable to side accounts	(2.86%)
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	21.82%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	4.36%
b. Preliminary size of rate collar (maximum of 3% or a.)	4.36%
c. Funded percentage	68%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	5.23%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	16.59%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	27.05%
7. Advisory July 1, 2019 total pension rate, before adjustment	28.06%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(1.01%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	10.68%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	9.67%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	27.05%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	17.24%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	17.24%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	27.05%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.24%	16.55%
b. Tier 1/Tier 2 UAL rate	9.67%	5.12%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	27.05%	21.82%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$2,830,774	\$4,300,075	\$7,130,849
Tier 2	5,651,239	6,696,656	12,347,895
Tier 1/Tier 2 valuation payroll	8,482,013	10,996,731	19,478,744
OPSRP valuation payroll	17,697,299	7,540,181	25,237,480
Combined valuation payroll	\$26,179,312	\$18,536,912	\$44,716,224

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	32	75	262	369	38	79	223	340
Police & Fire	36	60	81	177	37	61	72	170
Total	68	135	343	546	75	140	295	510
Active Members with previous service segments with the employer								
General Service	16	16	N/A	32	14	20	N/A	34
Police & Fire	6	7	N/A	13	6	6	N/A	12
Total	22	23	N/A	45	20	26	N/A	46
Dormant Members								
General Service	28	34	18	80	28	26	12	66
Police & Fire	12	8	5	25	11	7	5	23
Total	40	42	23	105	39	33	17	89
Retired Members and Beneficiaries								
General Service	142	29	9	180	134	27	7	168
Police & Fire	112	1	0	113	114	1	0	115
Total	254	30	9	293	248	28	7	283
Grand Total Number of Members	384	230	375	989	382	227	319	928

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39		1	10	10						21
40-44			15	30	3					48
45-49		1	13	17	13	1				45
50-54		2	5	11	11	10				39
55-59			5	7	6	7	3	1		29
60-64		1	5	3	5	2	1			17
65-69					1				1	2
70-74			1	1						2
75+										
Total	0	5	54	79	39	20	4	1	1	203

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45	1	169
20-24			45-49	4	1,987
25-29			50-54	1	7,473
30-34			55-59	25	3,336
35-39	5	583	60-64	60	2,601
40-44	10	743	65-69	75	2,569
45-49	17	1,656	70-74	54	2,064
50-54	18	1,186	75-79	29	2,434
55-59	16	2,019	80-84	19	2,004
60-64	10	614	85-89	13	770
65-69	6	1,041	90-94	2	1,185
70-74			95-99	1	274
75+			100+		
Total	82	1,275	Total	284	2,396

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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November 2017

City of Canyonville/2149
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Canyonville/2149

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Canyonville/2149

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Canyonville -- #2149

November 2017

This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

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Executive Summary

Milliman has prepared this report for City of Canyonville to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Canyonville.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Canyonville

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	14.56%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	4.81%	4.81%	4.81%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	20.93%	14.86%	19.59%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	21.42%	15.28%	20.01%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 73%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	16.14%	16.14%
Minimum 2019-2021 Rate	12.91%	9.68%
Maximum 2019-2021 Rate	19.37%	22.60%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$1,221,583	\$1,673,061	\$451,478	73%	\$309,713	146%
12/31/2012	1,333,888	1,724,348	390,460	77%	314,703	124%
12/31/2013	1,474,051	1,627,567	153,516	91%	309,521	50%
12/31/2014	1,440,845	1,863,084	422,239	77%	279,461	151%
12/31/2015	1,377,386	1,758,563	381,177	78%	242,470	157%
12/31/2016	1,340,183	1,844,092	503,909	73%	337,711	149%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Canyonville

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$503,909	\$381,177
Allocated pooled OPSRP UAL	58,141	34,470
Side account	0	0
Net unfunded pension actuarial accrued liability	562,050	415,647
Combined valuation payroll	337,711	242,470
Net pension UAL as a percentage of payroll	166%	171%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$46)	\$1,177

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$15,846	\$15,719
Tier 1/Tier 2 valuation payroll	108,853	96,869
Tier 1/Tier 2 pension normal cost rate	14.56%	16.23%
Tier 1/ Tier 2 Actuarial accrued liability	\$1,844,092	\$1,758,563
Actuarial asset value	1,340,183	1,377,386
Tier 1/Tier 2 Unfunded actuarial accrued liability	503,909	381,177
Tier 1/ Tier 2 Funded status	73%	78%
Combined valuation payroll	\$337,711	\$242,470
Tier 1/Tier 2 UAL as a percentage of payroll	149%	157%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	4.81%	(0.09%)
Tier 1/Tier 2 active members ¹	2	2
Tier 1/Tier 2 dormant members	0	1
Tier 1/Tier 2 retirees and beneficiaries	25	23

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	337,711	242,470
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$48,316	\$106,643
2. Employer reserves	715,321	680,393
3. Benefits in force reserve	576,546	590,351
4. Total market value of assets (1. + 2. + 3.)	\$1,340,183	\$1,377,386

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$1,377,386
2. Regular employer contributions	14,214
3. Benefit payments and expenses	(112,885)
4. Adjustments ¹	(31,060)
5. Interest credited	92,528
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$1,340,183

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	8,832	9,560
Tier 2 Police & Fire	0	0
Tier 2 General Service	7,014	6,159
Total	\$15,846	\$15,719

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$15,515	\$15,846	\$331

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$13,448
▪ Tier 1 General Service	85,875	65,894
▪ Tier 2 Police & Fire	0	0
▪ Tier 2 General Service	396,617	364,071
▪ Total Active Members	\$482,492	\$443,413
Dormant Members	0	40,469
Retired Members and Beneficiaries	1,361,600	1,274,681
Total Actuarial Accrued Liability	\$1,844,092	\$1,758,563

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$1,806,602	\$1,844,092	\$37,490

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$1,844,092	\$1,758,563
2. Actuarial value of assets	1,340,183	1,377,386
3. Unfunded accrued liability (1. – 2.)	503,909	381,177
4. Funded percentage (2. ÷ 1.)	73%	78%
5. Combined valuation payroll	\$337,711	\$242,470
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	149%	157%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$153,398	\$11,927	\$11,028	\$152,499	\$12,086
December 31, 2015	\$227,779	\$16,482	\$16,425	\$227,722	\$16,663
December 31, 2016	N/A	N/A	N/A	\$123,688	\$8,733
Total				\$503,909	\$37,482

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$1,758,563
b. Normal cost at December 31, 2015 (excluding assumed expenses)	15,067
c. Benefit payments during 2016	(111,936)
d. Interest at 7.50% to December 31, 2016	128,260
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	1,789,954
f. Change in actuarial accrued liability due to assumption, method, and plan changes	37,490
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	1,827,444
2. Actuarial accrued liability at December 31, 2016	1,844,092
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(16,648)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	1,377,386
b. Contributions for 2016 ¹	14,214
c. Benefit payments and expenses during 2016	(112,885)
d. Interest at 7.50% to December 31, 2016	99,604
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	1,378,319
5. Actuarial value of assets at December 31, 2016	1,340,183
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(38,136)
7. Total actuarial gain/(loss) (3. + 6.)	(\$54,784)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$381,177
2. Expected increase	30,458
3. Liability (gain)/loss	16,648
4. Asset (gain)/loss	38,136
5. Change due to changes in assumptions, methods, and plan provisions	37,490
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$503,909

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	8,832	63,825	13.84%	9,560	56,434	16.94%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	7,014	45,028	15.58%	6,159	40,435	15.23%
Total	\$15,846	\$108,853	14.56%	\$15,719	\$96,869	16.23%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$503,909	\$381,177
2. Next year's Tier 1/Tier 2 UAL payment	37,482	28,409
3. Combined valuation payroll	337,711	242,470
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	11.10%	11.72%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	14.56%	16.23%
b. Tier 1/Tier 2 UAL rate	11.10%	11.72%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	25.80%	28.10%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	16.14%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	16.14%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.23%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.23%
c. Funded percentage	73%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.23%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	12.91%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	19.37%
7. Advisory July 1, 2019 total pension rate, before adjustment	25.80%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(6.43%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	11.10%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	4.67%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	19.37%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	14.56%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	14.56%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	19.37%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	14.56%	16.23%
b. Tier 1/Tier 2 UAL rate	4.67%	(0.24%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	19.37%	16.14%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$63,825	\$0	\$63,825
Tier 2	45,028	0	45,028
Tier 1/Tier 2 valuation payroll	108,853	0	108,853
OPSRP valuation payroll	228,858	0	228,858
Combined valuation payroll	\$337,711	\$0	\$337,711

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	1	1	6	8	1	1	4	6
Police & Fire	0	0	0	0	0	0	0	0
Total	1	1	6	8	1	1	4	6
Active Members with previous service segments with the employer								
General Service	1	5	N/A	6	2	5	N/A	7
Police & Fire	0	0	N/A	0	1	0	N/A	1
Total	1	5	N/A	6	3	5	N/A	8
Dormant Members								
General Service	0	0	1	1	0	1	1	2
Police & Fire	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	1	1	2
Retired Members and Beneficiaries								
General Service	13	3	0	16	12	3	0	15
Police & Fire	9	0	0	9	7	1	0	8
Total	22	3	0	25	19	4	0	23
Grand Total Number of Members	24	9	7	40	23	11	5	39

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49										
50-54										
55-59				1						1
60-64					1					1
65-69										
70-74										
75+										
Total	0	0	0	1	1	0	0	0	0	2

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49	1	100
25-29			50-54	2	91
30-34			55-59		
35-39			60-64	6	180
40-44			65-69	3	337
45-49			70-74	2	1,079
50-54			75-79	2	56
55-59			80-84	5	549
60-64			85-89	3	943
65-69			90-94	1	252
70-74			95-99		
75+			100+		
Total			Total	25	419

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Chiloquin/2186
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.

November 2017
City of Chiloquin/2186

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Chiloquin/2186

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Chiloquin -- #2186

November 2017

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Executive Summary

Milliman has prepared this report for City of Chiloquin to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Chiloquin.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Chiloquin

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	16.46%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	(1.55%)	(1.55%)	(1.55%)
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	16.47%	8.50%	13.23%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	16.96%	8.92%	13.65%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 111%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	12.82%	12.82%
Minimum 2019-2021 Rate	9.82%	6.82%
Maximum 2019-2021 Rate	15.82%	18.82%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$269,067	\$209,321	(\$59,746)	129%	\$131,874	(45%)
12/31/2012	301,930	247,577	(54,353)	122%	173,359	(31%)
12/31/2013	338,970	260,327	(78,643)	130%	176,570	(45%)
12/31/2014	352,984	306,561	(46,423)	115%	177,348	(26%)
12/31/2015	350,569	324,903	(25,666)	108%	174,300	(15%)
12/31/2016	367,662	332,416	(35,246)	111%	179,420	(20%)

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Chiloquin

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	(\$35,246)	(\$25,666)
Allocated pooled OPSRP UAL	30,889	24,779
Side account	0	0
Net unfunded pension actuarial accrued liability	(4,357)	(887)
Combined valuation payroll	179,420	174,300
Net pension UAL as a percentage of payroll	(2%)	(1%)
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$24)	\$846

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$8,137	\$7,525
Tier 1/Tier 2 valuation payroll	49,423	47,079
Tier 1/Tier 2 pension normal cost rate	16.46%	15.98%
Tier 1/ Tier 2 Actuarial accrued liability	\$332,416	\$324,903
Actuarial asset value	367,662	350,569
Tier 1/Tier 2 Unfunded actuarial accrued liability	(35,246)	(25,666)
Tier 1/ Tier 2 Funded status	111%	108%
Combined valuation payroll	\$179,420	\$174,300
Tier 1/Tier 2 UAL as a percentage of payroll	(20%)	(15%)
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	(1.55%)	(3.16%)
Tier 1/Tier 2 active members ¹	1	1
Tier 1/Tier 2 dormant members	1	1
Tier 1/Tier 2 retirees and beneficiaries	1	1

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	179,420	174,300
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$45,301	\$43,048
2. Employer reserves	284,667	264,477
3. Benefits in force reserve	37,694	43,044
4. Total market value of assets (1. + 2. + 3.)	\$367,662	\$350,569

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$350,569
2. Regular employer contributions	1,415
3. Benefit payments and expenses	(7,380)
4. Adjustments ¹	(1,536)
5. Interest credited	24,594
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$367,662

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	0	0
Tier 2 Police & Fire	0	0
Tier 2 General Service	8,137	7,525
Total	\$8,137	\$7,525

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$7,903	\$8,137	\$234

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	0	0
▪ Tier 2 General Service	230,676	219,823
▪ Total Active Members	\$230,676	\$219,823
Dormant Members	12,720	12,140
Retired Members and Beneficiaries	89,020	92,940
Total Actuarial Accrued Liability	\$332,416	\$324,903

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$344,941	\$332,416	(\$12,525)

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$332,416	\$324,903
2. Actuarial value of assets	367,662	350,569
3. Unfunded accrued liability (1. – 2.)	(35,246)	(25,666)
4. Funded percentage (2. ÷ 1.)	111%	108%
5. Combined valuation payroll	\$179,420	\$174,300
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	(20%)	(15%)

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$78,583)	(\$6,110)	(\$5,650)	(\$78,123)	(\$6,191)
December 31, 2015	\$52,917	\$3,829	\$3,816	\$52,904	\$3,871
December 31, 2016	N/A	N/A	N/A	(\$10,027)	(\$708)
Total				(\$35,246)	(\$3,028)

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$324,903
b. Normal cost at December 31, 2015 (excluding assumed expenses)	7,177
c. Benefit payments during 2016	(7,318)
d. Interest at 7.50% to December 31, 2016	24,362
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	349,124
f. Change in actuarial accrued liability due to assumption, method, and plan changes	(12,525)
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	336,599
2. Actuarial accrued liability at December 31, 2016	332,416
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	4,183
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	350,569
b. Contributions for 2016 ¹	1,415
c. Benefit payments and expenses during 2016	(7,380)
d. Interest at 7.50% to December 31, 2016	26,069
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	370,673
5. Actuarial value of assets at December 31, 2016	367,662
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(3,011)
7. Total actuarial gain/(loss) (3. + 6.)	\$1,172

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	(\$25,666)
2. Expected increase	4,117
3. Liability (gain)/loss	(4,183)
4. Asset (gain)/loss	3,011
5. Change due to changes in assumptions, methods, and plan provisions	(12,525)
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	(\$35,246)

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	8,137	49,423	16.46%	7,525	47,079	15.98%
Total	\$8,137	\$49,423	16.46%	\$7,525	\$47,079	15.98%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	(\$35,246)	(\$25,666)
2. Next year's Tier 1/Tier 2 UAL payment	(3,028)	(2,281)
3. Combined valuation payroll	179,420	174,300
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	(1.69%)	(1.31%)

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	16.46%	15.98%
b. Tier 1/Tier 2 UAL rate	(1.69%)	(1.31%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	14.91%	14.82%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	12.82%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	12.82%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	2.56%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.00%
c. Funded percentage	111%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.00%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	9.82%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	15.82%
7. Advisory July 1, 2019 total pension rate, before adjustment	14.91%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	0.00%
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	(1.69%)
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	(1.69%)
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	14.91%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	16.46%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	16.46%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	14.91%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	16.46%	15.98%
b. Tier 1/Tier 2 UAL rate	(1.69%)	(3.31%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	14.91%	12.82%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$0	\$0
Tier 2	49,423	0	49,423
Tier 1/Tier 2 valuation payroll	49,423	0	49,423
OPSRP valuation payroll	129,997	0	129,997
Combined valuation payroll	\$179,420	\$0	\$179,420

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	1	3	4	0	1	3	4
Police & Fire	0	0	0	0	0	0	0	0
Total	0	1	3	4	0	1	3	4
Active Members with previous service segments with the employer								
General Service	0	1	N/A	1	0	1	N/A	1
Police & Fire	0	0	N/A	0	0	0	N/A	0
Total	0	1	N/A	1	0	1	N/A	1
Dormant Members								
General Service	1	0	0	1	1	0	0	1
Police & Fire	0	0	0	0	0	0	0	0
Total	1	0	0	1	1	0	0	1
Retired Members and Beneficiaries								
General Service	1	0	0	1	1	0	0	1
Police & Fire	0	0	0	0	0	0	0	0
Total	1	0	0	1	1	0	0	1
Grand Total Number of Members	2	2	3	7	2	2	3	7

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49										
50-54										
55-59										
60-64				1						1
65-69										
70-74										
75+										
Total	0	0	0	1	0	0	0	0	0	1

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64		
40-44			65-69		
45-49			70-74	1	745
50-54			75-79		
55-59			80-84		
60-64	1	81	85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total	1	81	Total	1	745

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Clatskanie/2162
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Clatskanie/2162

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Clatskanie/2162

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Clatskanie -- #2162

November 2017

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Executive Summary

Milliman has prepared this report for City of Clatskanie to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Clatskanie.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Clatskanie

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	16.42%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	6.54%	6.54%	6.54%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	24.52%	16.59%	21.32%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	25.01%	17.01%	21.74%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 65%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	17.66%	17.66%
Minimum 2019-2021 Rate	14.13%	10.60%
Maximum 2019-2021 Rate	21.19%	24.72%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$6,731,192	\$8,033,650	\$1,302,458	84%	\$1,019,475	128%
12/31/2012	7,442,100	7,822,198	380,098	95%	872,808	44%
12/31/2013	6,150,130	7,105,945	955,815	87%	814,163	117%
12/31/2014	6,181,484	8,189,911	2,008,427	75%	967,961	207%
12/31/2015	5,868,422	8,367,608	2,499,186	70%	958,127	261%
12/31/2016	5,819,202	8,902,939	3,083,737	65%	753,673	409%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Clatskanie

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$3,083,737	\$2,499,186
Allocated pooled OPSRP UAL	129,754	136,211
Side account	0	0
Net unfunded pension actuarial accrued liability	3,213,491	2,635,397
Combined valuation payroll	753,673	958,127
Net pension UAL as a percentage of payroll	426%	275%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$103)	\$4,652

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$37,035	\$56,394
Tier 1/Tier 2 valuation payroll	225,591	343,890
Tier 1/Tier 2 pension normal cost rate	16.42%	16.40%
Tier 1/ Tier 2 Actuarial accrued liability	\$8,902,939	\$8,367,608
Actuarial asset value	5,819,202	5,868,422
Tier 1/Tier 2 Unfunded actuarial accrued liability	3,083,737	2,499,186
Tier 1/ Tier 2 Funded status	65%	70%
Combined valuation payroll	\$753,673	\$958,127
Tier 1/Tier 2 UAL as a percentage of payroll	409%	261%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	6.54%	1.26%
Tier 1/Tier 2 active members ¹	3	5
Tier 1/Tier 2 dormant members	3	3
Tier 1/Tier 2 retirees and beneficiaries	26	23

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	753,673	958,127
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$370,871	\$387,831
2. Employer reserves	2,346,616	2,326,643
3. Benefits in force reserve	3,101,715	3,153,948
4. Total market value of assets (1. + 2. + 3.)	\$5,819,202	\$5,868,422

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$5,868,422
2. Regular employer contributions	38,616
3. Benefit payments and expenses	(607,300)
4. Adjustments ¹	112,201
5. Interest credited	407,264
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$5,819,202

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	8,975	8,401
Tier 2 Police & Fire	15,850	14,949
Tier 2 General Service	12,210	33,044
Total	\$37,035	\$56,394

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$35,875	\$37,035	\$1,160

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$166,818	\$194,183
▪ Tier 1 General Service	671,181	605,391
▪ Tier 2 Police & Fire	410,778	308,482
▪ Tier 2 General Service	143,500	275,094
▪ Total Active Members	\$1,392,277	\$1,383,150
Dormant Members	185,500	174,482
Retired Members and Beneficiaries	7,325,162	6,809,976
Total Actuarial Accrued Liability	\$8,902,939	\$8,367,608

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$8,629,043	\$8,902,939	\$273,896

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$8,902,939	\$8,367,608
2. Actuarial value of assets	5,819,202	5,868,422
3. Unfunded accrued liability (1. – 2.)	3,083,737	2,499,186
4. Funded percentage (2. ÷ 1.)	65%	70%
5. Combined valuation payroll	\$753,673	\$958,127
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	409%	261%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$955,078	\$74,262	\$68,664	\$949,480	\$75,248
December 31, 2015	\$1,544,108	\$111,730	\$111,344	\$1,543,722	\$112,961
December 31, 2016	N/A	N/A	N/A	\$590,535	\$41,696
Total				\$3,083,737	\$229,905

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$8,367,608
b. Normal cost at December 31, 2015 (excluding assumed expenses)	53,783
c. Benefit payments during 2016	(602,193)
d. Interest at 7.50% to December 31, 2016	607,005
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	8,426,203
f. Change in actuarial accrued liability due to assumption, method, and plan changes	273,896
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	8,700,099
2. Actuarial accrued liability at December 31, 2016	8,902,939
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(202,840)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	5,868,422
b. Contributions for 2016 ¹	38,616
c. Benefit payments and expenses during 2016	(607,300)
d. Interest at 7.50% to December 31, 2016	418,806
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	5,718,543
5. Actuarial value of assets at December 31, 2016	5,819,202
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	100,659
7. Total actuarial gain/(loss) (3. + 6.)	(\$102,181)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$2,499,186
2. Expected increase	208,474
3. Liability (gain)/loss	202,840
4. Asset (gain)/loss	(100,659)
5. Change due to changes in assumptions, methods, and plan provisions	273,896
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$3,083,737

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	8,975	51,490	17.43%	8,401	50,431	16.66%
Tier 2 Police & Fire	15,850	84,336	18.79%	14,949	76,124	19.64%
Tier 2 General Service	12,210	89,765	13.60%	33,044	217,335	15.20%
Total	\$37,035	\$225,591	16.42%	\$56,394	\$343,890	16.40%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$3,083,737	\$2,499,186
2. Next year's Tier 1/Tier 2 UAL payment	229,905	185,992
3. Combined valuation payroll	753,673	958,127
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	30.50%	19.41%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	16.42%	16.40%
b. Tier 1/Tier 2 UAL rate	30.50%	19.41%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	47.06%	35.96%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	17.66%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	17.66%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.53%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.53%
c. Funded percentage	65%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	5.30%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	12.36%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	22.96%
7. Advisory July 1, 2019 total pension rate, before adjustment	47.06%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(24.10%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	30.50%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	6.40%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	22.96%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	16.42%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	16.42%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	22.96%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	16.42%	16.40%
b. Tier 1/Tier 2 UAL rate	6.40%	1.11%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	22.96%	17.66%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$51,490	\$0	\$51,490
Tier 2	89,765	84,336	174,101
Tier 1/Tier 2 valuation payroll	141,255	84,336	225,591
OPSRP valuation payroll	419,558	108,524	528,082
Combined valuation payroll	\$560,813	\$192,860	\$753,673

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	1	1	7	9	1	3	6	10
Police & Fire	0	1	2	3	0	1	4	5
Total	1	2	9	12	1	4	10	15
Active Members with previous service segments with the employer								
General Service	2	1	N/A	3	2	0	N/A	2
Police & Fire	2	0	N/A	2	3	0	N/A	3
Total	4	1	N/A	5	5	0	N/A	5
Dormant Members								
General Service	0	0	0	0	0	0	0	0
Police & Fire	3	0	1	4	3	0	0	3
Total	3	0	1	4	3	0	0	3
Retired Members and Beneficiaries								
General Service	12	2	0	14	12	1	0	13
Police & Fire	11	1	0	12	9	1	0	10
Total	23	3	0	26	21	2	0	23
Grand Total Number of Members	31	6	10	47	30	6	10	46

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49				1						1
50-54			1							1
55-59										
60-64					1					1
65-69										
70-74										
75+										
Total	0	0	1	1	1	0	0	0	0	3

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45	1	2,943
20-24			45-49		
25-29			50-54	2	81
30-34			55-59	6	1,348
35-39			60-64	3	3,262
40-44			65-69	7	1,644
45-49	1	0	70-74	3	2,484
50-54	2	563	75-79	1	113
55-59			80-84	2	332
60-64			85-89	1	1,996
65-69			90-94		
70-74			95-99		
75+			100+		
Total	3	375	Total	26	1,643

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Coos Bay/2152
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Coos Bay/2152

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Coos Bay/2152

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Coos Bay -- #2152

November 2017

Secondary Employers

2190 City Of Eastside

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Executive Summary

Milliman has prepared this report for City of Coos Bay to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Coos Bay.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Coos Bay

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	19.39%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	3.60%	3.60%	3.60%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	24.55%	13.65%	18.38%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	25.04%	14.07%	18.80%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 71%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	19.16%	19.16%
Minimum 2019-2021 Rate	15.33%	11.50%
Maximum 2019-2021 Rate	22.99%	26.82%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$35,279,915	\$42,431,747	\$7,151,832	83%	\$6,136,958	117%
12/31/2012	39,127,841	43,090,689	3,962,848	91%	6,598,945	60%
12/31/2013	41,335,740	45,297,166	3,961,426	91%	6,468,089	61%
12/31/2014	42,228,086	53,256,432	11,028,346	79%	6,686,955	165%
12/31/2015	41,835,830	55,360,000	13,524,170	76%	7,153,305	189%
12/31/2016	42,065,153	58,875,451	16,810,298	71%	7,177,395	234%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Coos Bay

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$16,810,298	\$13,524,170
Allocated pooled OPSRP UAL	1,235,676	1,016,942
Side account	0	0
Net unfunded pension actuarial accrued liability	18,045,974	14,541,112
Combined valuation payroll	7,177,395	7,153,305
Net pension UAL as a percentage of payroll	251%	203%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$977)	\$34,734

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$719,199	\$778,230
Tier 1/Tier 2 valuation payroll	3,709,839	4,065,836
Tier 1/Tier 2 pension normal cost rate	19.39%	19.14%
Tier 1/ Tier 2 Actuarial accrued liability	\$58,875,451	\$55,360,000
Actuarial asset value	42,065,153	41,835,830
Tier 1/Tier 2 Unfunded actuarial accrued liability	16,810,298	13,524,170
Tier 1/ Tier 2 Funded status	71%	76%
Combined valuation payroll	\$7,177,395	\$7,153,305
Tier 1/Tier 2 UAL as a percentage of payroll	234%	189%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	3.60%	0.02%
Tier 1/Tier 2 active members ¹	44	49
Tier 1/Tier 2 dormant members	18	13
Tier 1/Tier 2 retirees and beneficiaries	138	132

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	7,177,395	7,153,305
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$4,951,313	\$5,271,404
2. Employer reserves	22,040,065	21,646,905
3. Benefits in force reserve	15,073,775	14,917,520
4. Total market value of assets (1. + 2. + 3.)	\$42,065,153	\$41,835,830

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$41,835,830
2. Regular employer contributions	638,227
3. Benefit payments and expenses	(2,951,370)
4. Adjustments ¹	(386,462)
5. Interest credited	2,928,929
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$42,065,153

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$206,774	\$255,980
Tier 1 General Service	136,664	149,255
Tier 2 Police & Fire	304,232	306,069
Tier 2 General Service	71,529	66,926
Total	\$719,199	\$778,230

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$698,716	\$719,199	\$20,483

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$7,895,386	\$8,598,325
▪ Tier 1 General Service	5,182,181	5,476,634
▪ Tier 2 Police & Fire	6,428,384	5,735,174
▪ Tier 2 General Service	1,209,102	1,031,829
▪ Total Active Members	\$20,715,053	\$20,841,962
Dormant Members	2,561,423	2,308,256
Retired Members and Beneficiaries	35,598,975	32,209,782
Total Actuarial Accrued Liability	\$58,875,451	\$55,360,000

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$57,407,651	\$58,875,451	\$1,467,800

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$58,875,451	\$55,360,000
2. Actuarial value of assets	42,065,153	41,835,830
3. Unfunded accrued liability (1. – 2.)	16,810,298	13,524,170
4. Funded percentage (2. ÷ 1.)	71%	76%
5. Combined valuation payroll	\$7,177,395	\$7,153,305
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	234%	189%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$3,958,371	\$307,781	\$284,582	\$3,935,172	\$311,870
December 31, 2015	\$9,565,799	\$692,171	\$689,782	\$9,563,410	\$699,796
December 31, 2016	N/A	N/A	N/A	\$3,311,716	\$233,829
Total				\$16,810,298	\$1,245,495

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$55,360,000
b. Normal cost at December 31, 2015 (excluding assumed expenses)	742,103
c. Benefit payments during 2016	(2,926,551)
d. Interest at 7.50% to December 31, 2016	4,070,083
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	57,245,635
f. Change in actuarial accrued liability due to assumption, method, and plan changes	1,467,800
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	58,713,435
2. Actuarial accrued liability at December 31, 2016	58,875,451
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(162,016)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	41,835,830
b. Contributions for 2016 ¹	638,227
c. Benefit payments and expenses during 2016	(2,951,370)
d. Interest at 7.50% to December 31, 2016	3,050,944
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	42,573,631
5. Actuarial value of assets at December 31, 2016	42,065,153
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(508,478)
7. Total actuarial gain/(loss) (3. + 6.)	(\$670,494)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$13,524,170
2. Expected increase	1,147,834
3. Liability (gain)/loss	162,016
4. Asset (gain)/loss	508,478
5. Change due to changes in assumptions, methods, and plan provisions	1,467,800
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$16,810,298

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$206,774	\$917,058	22.55%	\$255,980	\$1,168,286	21.91%
Tier 1 General Service	136,664	760,635	17.97%	149,255	794,003	18.80%
Tier 2 Police & Fire	304,232	1,528,518	19.90%	306,069	1,609,063	19.02%
Tier 2 General Service	71,529	503,628	14.20%	66,926	494,484	13.53%
Total	\$719,199	\$3,709,839	19.39%	\$778,230	\$4,065,836	19.14%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$16,810,298	\$13,524,170
2. Next year's Tier 1/Tier 2 UAL payment	1,245,495	999,952
3. Combined valuation payroll	7,177,395	7,153,305
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	17.35%	13.98%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	19.39%	19.14%
b. Tier 1/Tier 2 UAL rate	17.35%	13.98%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	36.88%	33.27%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	19.16%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	19.16%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.83%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.83%
c. Funded percentage	71%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.83%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	15.33%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	22.99%
7. Advisory July 1, 2019 total pension rate, before adjustment	36.88%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(13.89%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	17.35%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	3.46%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	22.99%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	19.39%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	19.39%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	22.99%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	19.39%	19.14%
b. Tier 1/Tier 2 UAL rate	3.46%	(0.13%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	22.99%	19.16%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$760,635	\$917,058	\$1,677,693
Tier 2	503,628	1,528,518	2,032,146
Tier 1/Tier 2 valuation payroll	1,264,263	2,445,576	3,709,839
OPSRP valuation payroll	2,251,997	1,215,559	3,467,556
Combined valuation payroll	\$3,516,260	\$3,661,135	\$7,177,395

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	12	8	38	58	13	8	33	54
Police & Fire	8	16	13	37	11	17	13	41
Total	20	24	51	95	24	25	46	95
Active Members with previous service segments with the employer								
General Service	12	3	N/A	15	16	3	N/A	19
Police & Fire	9	3	N/A	12	11	2	N/A	13
Total	21	6	N/A	27	27	5	N/A	32
Dormant Members								
General Service	7	4	7	18	4	4	7	15
Police & Fire	7	0	0	7	5	0	1	6
Total	14	4	7	25	9	4	8	21
Retired Members and Beneficiaries								
General Service	75	7	0	82	72	8	0	80
Police & Fire	55	1	0	56	50	2	0	52
Total	130	8	0	138	122	10	0	132
Grand Total Number of Members	185	42	58	285	182	44	54	280

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39			1	1						2
40-44			1	5						6
45-49			2	5	6	1				14
50-54			1	1	1	4	1			8
55-59				1	2	1	1			5
60-64		1	2	1	1	1	1			7
65-69				1		1				2
70-74										
75+										
Total	0	1	7	15	10	8	3	0	0	44

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45	2	489
20-24			45-49	1	146
25-29			50-54	5	2,391
30-34			55-59	11	1,339
35-39			60-64	25	1,836
40-44			65-69	35	1,715
45-49	2	1,113	70-74	26	1,891
50-54	5	1,423	75-79	20	1,002
55-59	2	1,775	80-84	9	1,501
60-64	5	388	85-89	3	1,502
65-69	2	1,611	90-94	1	274
70-74	2	29	95-99		
75+			100+		
Total	18	1,006	Total	138	1,603

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Cornelius/2165
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Cornelius/2165

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Cornelius/2165

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Cornelius -- #2165

November 2017

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Executive Summary

Milliman has prepared this report for City of Cornelius to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Cornelius.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Cornelius

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	14.12%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	3.53%	3.53%	3.53%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	19.21%	13.58%	18.31%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	19.70%	14.00%	18.73%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 82%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	14.65%	14.65%
Minimum 2019-2021 Rate	11.65%	8.65%
Maximum 2019-2021 Rate	17.65%	20.65%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$12,741,384	\$14,273,829	\$1,532,445	89%	\$3,159,772	49%
12/31/2012	14,125,865	14,240,263	114,398	99%	3,158,935	4%
12/31/2013	15,582,414	15,109,557	(472,857)	103%	3,177,105	(15%)
12/31/2014	16,019,875	18,417,725	2,397,850	87%	2,121,002	113%
12/31/2015	15,857,678	18,608,088	2,750,410	85%	2,206,856	125%
12/31/2016	16,471,134	20,114,537	3,643,403	82%	2,381,110	153%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Cornelius

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$3,643,403	\$2,750,410
Allocated pooled OPSRP UAL	409,937	313,735
Side account	0	0
Net unfunded pension actuarial accrued liability	4,053,340	3,064,145
Combined valuation payroll	2,381,110	2,206,856
Net pension UAL as a percentage of payroll	170%	139%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$324)	\$10,716

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer’s combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$175,497	\$178,679
Tier 1/Tier 2 valuation payroll	1,243,000	1,276,241
Tier 1/Tier 2 pension normal cost rate	14.12%	14.00%
Tier 1/ Tier 2 Actuarial accrued liability	\$20,114,537	\$18,608,088
Actuarial asset value	16,471,134	15,857,678
Tier 1/Tier 2 Unfunded actuarial accrued liability	3,643,403	2,750,410
Tier 1/ Tier 2 Funded status	82%	85%
Combined valuation payroll	\$2,381,110	\$2,206,856
Tier 1/Tier 2 UAL as a percentage of payroll	153%	125%
Tier 1/Tier 2 UAL rate	3.53%	0.65%
(includes Multnomah Fire District #10)		
Tier 1/Tier 2 active members ¹	16	17
Tier 1/Tier 2 dormant members	19	16
Tier 1/Tier 2 retirees and beneficiaries	48	49

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	2,381,110	2,206,856
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$2,905,839	\$2,778,755
2. Employer reserves	9,640,690	8,919,370
3. Benefits in force reserve	3,924,605	4,159,553
4. Total market value of assets (1. + 2. + 3.)	\$16,471,134	\$15,857,678

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$15,857,678
2. Regular employer contributions	135,656
3. Benefit payments and expenses	(768,418)
4. Adjustments ¹	129,181
5. Interest credited	1,117,038
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$16,471,134

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	78,159	85,938
Tier 2 Police & Fire	16,475	16,072
Tier 2 General Service	80,863	76,669
Total	\$175,497	\$178,679

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$172,692	\$175,497	\$2,805

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$2,298,370	\$2,110,992
▪ Tier 1 General Service	2,514,463	2,879,675
▪ Tier 2 Police & Fire	1,209,017	1,143,715
▪ Tier 2 General Service	2,529,489	2,308,918
▪ Total Active Members	\$8,551,339	\$8,443,300
Dormant Members	2,294,655	1,183,518
Retired Members and Beneficiaries	9,268,543	8,981,270
Total Actuarial Accrued Liability	\$20,114,537	\$18,608,088

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$19,715,099	\$20,114,537	\$399,438

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$20,114,537	\$18,608,088
2. Actuarial value of assets	16,471,134	15,857,678
3. Unfunded accrued liability (1. – 2.)	3,643,403	2,750,410
4. Funded percentage (2. ÷ 1.)	82%	85%
5. Combined valuation payroll	\$2,381,110	\$2,206,856
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	153%	125%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	(\$472,492)	(\$36,738)	(\$33,969)	(\$469,723)	(\$37,226)
December 31, 2015	\$3,222,902	\$233,206	\$232,401	\$3,222,097	\$235,775
December 31, 2016	N/A	N/A	N/A	\$891,029	\$62,912
Total				\$3,643,403	\$261,461

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$18,608,088
b. Normal cost at December 31, 2015 (excluding assumed expenses)	170,408
c. Benefit payments during 2016	(761,956)
d. Interest at 7.50% to December 31, 2016	1,373,424
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	19,389,964
f. Change in actuarial accrued liability due to assumption, method, and plan changes	399,438
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	19,789,402
2. Actuarial accrued liability at December 31, 2016	20,114,537
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(325,135)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	15,857,678
b. Contributions for 2016 ¹	135,656
c. Benefit payments and expenses during 2016	(768,418)
d. Interest at 7.50% to December 31, 2016	1,165,597
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	16,390,513
5. Actuarial value of assets at December 31, 2016	16,471,134
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	80,622
7. Total actuarial gain/(loss) (3. + 6.)	(\$244,513)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$2,750,410
2. Expected increase	249,042
3. Liability (gain)/loss	325,135
4. Asset (gain)/loss	(80,622)
5. Change due to changes in assumptions, methods, and plan provisions	399,438
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$3,643,403

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	78,159	529,283	14.77%	85,938	570,449	15.06%
Tier 2 Police & Fire	16,475	92,394	17.83%	16,072	94,949	16.93%
Tier 2 General Service	80,863	621,323	13.01%	76,669	610,843	12.55%
Total	\$175,497	\$1,243,000	14.12%	\$178,679	\$1,276,241	14.00%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$3,643,403	\$2,750,410
2. Next year's Tier 1/Tier 2 UAL payment	261,461	196,468
3. Combined valuation payroll	2,381,110	2,206,856
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	10.98%	8.90%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	14.12%	14.00%
b. Tier 1/Tier 2 UAL rate	10.98%	8.90%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	25.24%	23.05%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	14.65%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	14.65%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	2.93%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.00%
c. Funded percentage	82%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.00%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	11.65%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	17.65%
7. Advisory July 1, 2019 total pension rate, before adjustment	25.24%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(7.59%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	10.98%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	3.39%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	17.65%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	14.12%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	14.12%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	17.65%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	14.12%	14.00%
b. Tier 1/Tier 2 UAL rate	3.39%	0.50%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	17.65%	14.65%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$529,283	\$0	\$529,283
Tier 2	621,323	92,394	713,717
Tier 1/Tier 2 valuation payroll	1,150,606	92,394	1,243,000
OPSRP valuation payroll	798,384	339,726	1,138,110
Combined valuation payroll	\$1,948,990	\$432,120	\$2,381,110

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	6	9	18	33	7	9	15	31
Police & Fire	0	1	5	6	0	1	4	5
Total	6	10	23	39	7	10	19	36
Active Members with previous service segments with the employer								
General Service	3	11	N/A	14	5	12	N/A	17
Police & Fire	10	7	N/A	17	10	7	N/A	17
Total	13	18	N/A	31	15	19	N/A	34
Dormant Members								
General Service	9	6	0	15	6	6	0	12
Police & Fire	3	1	0	4	3	1	0	4
Total	12	7	0	19	9	7	0	16
Retired Members and Beneficiaries								
General Service	19	4	1	24	21	3	0	24
Police & Fire	25	0	0	25	24	1	0	25
Total	44	4	1	49	45	4	0	49
Grand Total Number of Members	75	39	24	138	76	40	19	135

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39				2						2
40-44				2						2
45-49				2	2					4
50-54										
55-59					2					2
60-64				1			2			3
65-69			1	1	1					3
70-74										
75+										
Total	0	0	1	8	5	0	2	0	0	16

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45	4	1,029
20-24			45-49	1	1,029
25-29			50-54	3	534
30-34	1	232	55-59	1	444
35-39	1	0	60-64	15	1,573
40-44	2	754	65-69	10	945
45-49	1	215	70-74	6	1,904
50-54	3	944	75-79	4	1,068
55-59	4	446	80-84	3	1,514
60-64	5	1,097	85-89	1	29
65-69	2	2,135	90-94		
70-74			95-99		
75+			100+		
Total	19	859	Total	48	1,261

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Cottage Grove/2127
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Cottage Grove/2127

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Cottage Grove/2127

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Cottage Grove -- #2127

November 2017

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Executive Summary

Milliman has prepared this report for City of Cottage Grove to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Cottage Grove.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Cottage Grove

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	19.21%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	4.55%	4.55%	4.55%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	25.32%	14.60%	19.33%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	25.81%	15.02%	19.75%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 77%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	19.80%	19.80%
Minimum 2019-2021 Rate	15.84%	11.88%
Maximum 2019-2021 Rate	23.76%	27.72%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$31,039,561	\$35,814,645	\$4,775,084	87%	\$3,832,180	125%
12/31/2012	34,036,351	35,941,947	1,905,596	95%	4,097,780	47%
12/31/2013	37,269,216	37,629,931	360,715	99%	4,087,108	9%
12/31/2014	37,939,466	44,292,348	6,352,882	86%	3,965,429	160%
12/31/2015	36,599,494	45,963,462	9,363,968	80%	4,112,295	228%
12/31/2016	37,217,684	48,378,059	11,160,374	77%	4,080,744	273%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Cottage Grove

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$11,160,374	\$9,363,968
Allocated pooled OPSRP UAL	702,550	584,620
Side account	0	0
Net unfunded pension actuarial accrued liability	11,862,924	9,948,588
Combined valuation payroll	4,080,744	4,112,295
Net pension UAL as a percentage of payroll	291%	242%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$556)	\$19,968

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$404,919	\$423,130
Tier 1/Tier 2 valuation payroll	2,107,402	2,296,733
Tier 1/Tier 2 pension normal cost rate	19.21%	18.42%
Tier 1/ Tier 2 Actuarial accrued liability	\$48,378,059	\$45,963,462
Actuarial asset value	37,217,685	36,599,494
Tier 1/Tier 2 Unfunded actuarial accrued liability	11,160,374	9,363,968
Tier 1/ Tier 2 Funded status	77%	80%
Combined valuation payroll	\$4,080,744	\$4,112,295
Tier 1/Tier 2 UAL as a percentage of payroll	273%	228%
Tier 1/Tier 2 UAL rate	4.55%	1.38%
(includes Multnomah Fire District #10)		
Tier 1/Tier 2 active members ¹	30	34
Tier 1/Tier 2 dormant members	25	24
Tier 1/Tier 2 retirees and beneficiaries	116	112

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	4,080,744	4,112,295
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$4,752,328	\$4,743,580
2. Employer reserves	19,076,551	17,905,784
3. Benefits in force reserve	13,388,805	13,950,130
4. Total market value of assets (1. + 2. + 3.)	\$37,217,685	\$36,599,494

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$36,599,494
2. Regular employer contributions	388,503
3. Benefit payments and expenses	(2,621,462)
4. Adjustments ¹	301,941
5. Interest credited	2,549,208
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$37,217,685

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$99,568	\$89,143
Tier 1 General Service	201,803	206,191
Tier 2 Police & Fire	18,283	28,775
Tier 2 General Service	85,265	99,021
Total	\$404,919	\$423,130

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$398,554	\$404,919	\$6,365

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$5,115,656	\$4,557,596
▪ Tier 1 General Service	5,391,960	5,615,564
▪ Tier 2 Police & Fire	903,351	784,041
▪ Tier 2 General Service	2,412,384	2,664,860
▪ Total Active Members	\$13,823,351	\$13,622,061
Dormant Members	2,935,041	2,220,400
Retired Members and Beneficiaries	31,619,667	30,121,001
Total Actuarial Accrued Liability	\$48,378,059	\$45,963,462

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$47,191,007	\$48,378,059	\$1,187,052

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$48,378,059	\$45,963,462
2. Actuarial value of assets	37,217,685	36,599,494
3. Unfunded accrued liability (1. – 2.)	11,160,374	9,363,968
4. Funded percentage (2. ÷ 1.)	77%	80%
5. Combined valuation payroll	\$4,080,744	\$4,112,295
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	273%	228%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$360,437	\$28,026	\$25,913	\$358,324	\$28,398
December 31, 2015	\$9,003,531	\$651,486	\$649,237	\$9,001,282	\$658,663
December 31, 2016	N/A	N/A	N/A	\$1,800,768	\$127,146
Total				\$11,160,374	\$814,207

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$45,963,462
b. Normal cost at December 31, 2015 (excluding assumed expenses)	403,415
c. Benefit payments during 2016	(2,599,417)
d. Interest at 7.50% to December 31, 2016	3,364,910
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	47,132,370
f. Change in actuarial accrued liability due to assumption, method, and plan changes	1,187,052
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	48,319,422
2. Actuarial accrued liability at December 31, 2016	48,378,059
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(58,637)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	36,599,494
b. Contributions for 2016 ¹	388,503
c. Benefit payments and expenses during 2016	(2,621,462)
d. Interest at 7.50% to December 31, 2016	2,661,226
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	37,027,761
5. Actuarial value of assets at December 31, 2016	37,217,685
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	189,923
7. Total actuarial gain/(loss) (3. + 6.)	\$131,286

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$9,363,968
2. Expected increase	740,640
3. Liability (gain)/loss	58,637
4. Asset (gain)/loss	(189,923)
5. Change due to changes in assumptions, methods, and plan provisions	1,187,052
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$11,160,374

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$99,568	\$442,647	22.49%	\$89,143	\$407,516	21.87%
Tier 1 General Service	201,803	907,452	22.24%	206,191	949,242	21.72%
Tier 2 Police & Fire	18,283	89,383	20.45%	28,775	154,890	18.58%
Tier 2 General Service	85,265	667,920	12.77%	99,021	785,085	12.61%
Total	\$404,919	\$2,107,402	19.21%	\$423,130	\$2,296,733	18.42%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$11,160,374	\$9,363,968
2. Next year's Tier 1/Tier 2 UAL payment	814,207	679,512
3. Combined valuation payroll	4,080,744	4,112,295
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	19.95%	16.52%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	19.21%	18.42%
b. Tier 1/Tier 2 UAL rate	19.95%	16.52%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	39.30%	35.09%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	19.80%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	19.80%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.96%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.96%
c. Funded percentage	77%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.96%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	15.84%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	23.76%
7. Advisory July 1, 2019 total pension rate, before adjustment	39.30%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(15.54%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	19.95%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	4.41%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	23.76%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	19.21%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	19.21%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	23.76%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	19.21%	18.42%
b. Tier 1/Tier 2 UAL rate	4.41%	1.23%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	23.76%	19.80%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$907,452	\$442,647	\$1,350,099
Tier 2	667,920	89,383	757,303
Tier 1/Tier 2 valuation payroll	1,575,372	532,030	2,107,402
OPSRP valuation payroll	1,290,377	682,965	1,973,342
Combined valuation payroll	\$2,865,749	\$1,214,995	\$4,080,744

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	12	12	30	54	13	14	33	60
Police & Fire	5	1	10	16	5	2	7	14
Total	17	13	40	70	18	16	40	74
Active Members with previous service segments with the employer								
General Service	5	13	N/A	18	6	14	N/A	20
Police & Fire	12	9	N/A	21	12	8	N/A	20
Total	17	22	N/A	39	18	22	N/A	40
Dormant Members								
General Service	12	8	4	24	12	6	5	23
Police & Fire	2	3	0	5	3	3	1	7
Total	14	11	4	29	15	9	6	30
Retired Members and Beneficiaries								
General Service	58	5	1	64	56	5	1	62
Police & Fire	51	2	0	53	49	2	0	51
Total	109	7	1	117	105	7	1	113
Grand Total Number of Members	157	53	45	255	156	54	47	257

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39			2							2
40-44			1	2						3
45-49				2	2					4
50-54			1	2	1	1				5
55-59			1		2	1	2	2		8
60-64				1	2	1		1	1	6
65-69				1	1					2
70-74										
75+										
Total	0	0	5	8	8	3	2	3	1	30

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54	4	1,675
30-34	1	155	55-59	12	2,610
35-39			60-64	30	1,574
40-44	1	1,105	65-69	24	1,813
45-49	5	876	70-74	23	1,784
50-54	6	1,073	75-79	7	1,086
55-59	6	977	80-84	9	1,009
60-64	4	658	85-89	4	1,250
65-69	1	2,561	90-94	3	805
70-74	1	466	95-99		
75+			100+		
Total	25	944	Total	116	1,671

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Culver/2257
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Culver/2257

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Culver/2257

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Culver -- #2257

November 2017

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Executive Summary

Milliman has prepared this report for City of Culver to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Culver.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Culver

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	12.81%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	13.80%	13.80%	13.80%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	28.17%	23.85%	28.58%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	28.66%	24.27%	29.00%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 47%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	19.01%	19.01%
Minimum 2019-2021 Rate	15.21%	11.41%
Maximum 2019-2021 Rate	22.81%	26.61%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$498,653	\$673,446	\$174,793	74%	\$108,081	162%
12/31/2012	563,057	653,919	90,862	86%	119,064	76%
12/31/2013	594,728	683,048	88,320	87%	107,541	82%
12/31/2014	618,520	839,407	220,887	74%	118,163	187%
12/31/2015	493,991	966,826	472,835	51%	98,164	482%
12/31/2016	491,788	1,037,642	545,854	47%	122,888	444%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Culver

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$545,854	\$472,835
Allocated pooled OPSRP UAL	21,157	13,955
Side account	0	0
Net unfunded pension actuarial accrued liability	567,011	486,790
Combined valuation payroll	122,888	98,164
Net pension UAL as a percentage of payroll	461%	496%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$17)	\$477

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$14,612	\$12,770
Tier 1/Tier 2 valuation payroll	114,107	98,164
Tier 1/Tier 2 pension normal cost rate	12.81%	13.01%
Tier 1/ Tier 2 Actuarial accrued liability	\$1,037,642	\$966,826
Actuarial asset value	491,788	493,991
Tier 1/Tier 2 Unfunded actuarial accrued liability	545,854	472,835
Tier 1/ Tier 2 Funded status	47%	51%
Combined valuation payroll	\$122,888	\$98,164
Tier 1/Tier 2 UAL as a percentage of payroll	444%	482%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	13.80%	6.00%
Tier 1/Tier 2 active members ¹	2	2
Tier 1/Tier 2 dormant members	1	1
Tier 1/Tier 2 retirees and beneficiaries	8	8

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	122,888	98,164
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$8,709	\$8,279
2. Employer reserves	119,797	97,701
3. Benefits in force reserve	363,282	388,011
4. Total market value of assets (1. + 2. + 3.)	\$491,788	\$493,991

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$493,991
2. Regular employer contributions	14,221
3. Benefit payments and expenses	(71,129)
4. Adjustments ¹	21,118
5. Interest credited	33,586
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$491,788

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	9,997	9,363
Tier 2 Police & Fire	0	0
Tier 2 General Service	4,615	3,407
Total	\$14,612	\$12,770

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$14,354	\$14,612	\$258

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	139,578	100,453
▪ Tier 2 Police & Fire	5,502	4,547
▪ Tier 2 General Service	13,726	4,177
▪ Total Active Members	\$158,806	\$109,177
Dormant Members	20,891	19,858
Retired Members and Beneficiaries	857,945	837,791
Total Actuarial Accrued Liability	\$1,037,642	\$966,826

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$994,480	\$1,037,642	\$43,162

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$1,037,642	\$966,826
2. Actuarial value of assets	491,788	493,991
3. Unfunded accrued liability (1. – 2.)	545,854	472,835
4. Funded percentage (2. ÷ 1.)	47%	51%
5. Combined valuation payroll	\$122,888	\$98,164
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	444%	482%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$88,251	\$6,862	\$6,345	\$87,734	\$6,953
December 31, 2015	\$384,584	\$27,828	\$27,732	\$384,488	\$28,135
December 31, 2016	N/A	N/A	N/A	\$73,632	\$5,199
Total				\$545,854	\$40,287

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$966,826
b. Normal cost at December 31, 2015 (excluding assumed expenses)	12,179
c. Benefit payments during 2016	(70,531)
d. Interest at 7.50% to December 31, 2016	70,324
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	978,798
f. Change in actuarial accrued liability due to assumption, method, and plan changes	43,162
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	1,021,960
2. Actuarial accrued liability at December 31, 2016	1,037,642
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(15,682)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	493,991
b. Contributions for 2016 ¹	14,221
c. Benefit payments and expenses during 2016	(71,129)
d. Interest at 7.50% to December 31, 2016	34,915
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	471,999
5. Actuarial value of assets at December 31, 2016	491,788
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	19,789
7. Total actuarial gain/(loss) (3. + 6.)	\$4,107

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$472,835
2. Expected increase	33,964
3. Liability (gain)/loss	15,682
4. Asset (gain)/loss	(19,789)
5. Change due to changes in assumptions, methods, and plan provisions	43,162
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$545,854

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	9,997	66,196	15.10%	9,363	62,753	14.92%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	4,615	47,911	9.63%	3,407	35,411	9.62%
Total	\$14,612	\$114,107	12.81%	\$12,770	\$98,164	13.01%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$545,854	\$472,835
2. Next year's Tier 1/Tier 2 UAL payment	40,287	34,690
3. Combined valuation payroll	122,888	98,164
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	32.78%	35.34%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	12.81%	13.01%
b. Tier 1/Tier 2 UAL rate	32.78%	35.34%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	45.73%	48.50%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	19.01%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	19.01%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.80%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.80%
c. Funded percentage	47%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	7.60%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	11.41%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	26.61%
7. Advisory July 1, 2019 total pension rate, before adjustment	45.73%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(19.12%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	32.78%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	13.66%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	26.61%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	12.81%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	12.81%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	26.61%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	12.81%	13.01%
b. Tier 1/Tier 2 UAL rate	13.66%	5.85%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	26.61%	19.01%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$66,196	\$0	\$66,196
Tier 2	47,911	0	47,911
Tier 1/Tier 2 valuation payroll	114,107	0	114,107
OPSRP valuation payroll	8,781	0	8,781
Combined valuation payroll	\$122,888	\$0	\$122,888

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	1	1	0	2	1	1	0	2
Police & Fire	0	0	0	0	0	0	0	0
Total	1	1	0	2	1	1	0	2
Active Members with previous service segments with the employer								
General Service	1	1	N/A	2	1	1	N/A	2
Police & Fire	0	1	N/A	1	0	1	N/A	1
Total	1	2	N/A	3	1	2	N/A	3
Dormant Members								
General Service	0	1	1	2	0	1	1	2
Police & Fire	0	0	0	0	0	0	0	0
Total	0	1	1	2	0	1	1	2
Retired Members and Beneficiaries								
General Service	6	0	0	6	6	0	0	6
Police & Fire	1	1	0	2	1	1	0	2
Total	7	1	0	8	7	1	0	8
Grand Total Number of Members	9	5	1	15	9	5	1	15

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49			1							1
50-54										
55-59					1					1
60-64										
65-69										
70-74										
75+										
Total	0	0	1	0	1	0	0	0	0	2

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64	2	734
40-44			65-69	4	638
45-49	1	279	70-74	1	1,262
50-54			75-79	1	231
55-59			80-84		
60-64			85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total	1	279	Total	8	689

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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November 2017

City of Dufur/2262
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.

November 2017
City of Dufur/2262

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Dufur/2262

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Dufur -- #2262

November 2017

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Executive Summary

Milliman has prepared this report for City of Dufur to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Dufur.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Dufur

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	16.95%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	5.15%	5.15%	5.15%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	23.66%	15.20%	19.93%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	24.15%	15.62%	20.35%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 75%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	18.42%	18.42%
Minimum 2019-2021 Rate	14.74%	11.06%
Maximum 2019-2021 Rate	22.10%	25.78%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$572,637	\$733,287	\$160,650	78%	\$91,905	175%
12/31/2012	629,723	718,190	88,467	88%	102,070	87%
12/31/2013	699,914	733,118	33,204	95%	108,602	31%
12/31/2014	712,173	852,957	140,784	83%	86,676	162%
12/31/2015	693,501	869,514	176,013	80%	119,198	148%
12/31/2016	712,040	945,005	232,965	75%	83,925	278%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Dufur

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$232,965	\$176,013
Allocated pooled OPSRP UAL	14,449	16,946
Side account	0	0
Net unfunded pension actuarial accrued liability	247,414	192,959
Combined valuation payroll	83,925	119,198
Net pension UAL as a percentage of payroll	295%	162%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$11)	\$579

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$0	\$7,810
Tier 1/Tier 2 valuation payroll	0	51,510
Tier 1/Tier 2 pension normal cost rate	16.95%	15.16%
Tier 1/ Tier 2 Actuarial accrued liability	\$945,005	\$869,514
Actuarial asset value	712,040	693,501
Tier 1/Tier 2 Unfunded actuarial accrued liability	232,965	176,013
Tier 1/ Tier 2 Funded status	75%	80%
Combined valuation payroll	\$83,925	\$119,198
Tier 1/Tier 2 UAL as a percentage of payroll	278%	148%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	5.15%	3.26%
Tier 1/Tier 2 active members ¹	0	1
Tier 1/Tier 2 dormant members	1	0
Tier 1/Tier 2 retirees and beneficiaries	6	6

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	83,925	119,198
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$48,481	\$46,119
2. Employer reserves	370,573	336,232
3. Benefits in force reserve	292,986	311,150
4. Total market value of assets (1. + 2. + 3.)	\$712,040	\$693,501

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$693,501
2. Regular employer contributions	9,762
3. Benefit payments and expenses	(57,365)
4. Adjustments ¹	17,729
5. Interest credited	48,413
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$712,040

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	0	7,810
Tier 2 Police & Fire	0	0
Tier 2 General Service	0	0
Total	\$0	\$7,810

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$0	\$0	\$0

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	0	197,682
▪ Tier 2 Police & Fire	0	0
▪ Tier 2 General Service	0	0
▪ Total Active Members	\$0	\$197,682
Dormant Members	253,074	0
Retired Members and Beneficiaries	691,931	671,832
Total Actuarial Accrued Liability	\$945,005	\$869,514

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$917,783	\$945,005	\$27,222

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$945,005	\$869,514
2. Actuarial value of assets	712,040	693,501
3. Unfunded accrued liability (1. – 2.)	232,965	176,013
4. Funded percentage (2. ÷ 1.)	75%	80%
5. Combined valuation payroll	\$83,925	\$119,198
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	278%	148%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$33,178	\$2,580	\$2,385	\$32,983	\$2,614
December 31, 2015	\$142,835	\$10,335	\$10,300	\$142,800	\$10,449
December 31, 2016	N/A	N/A	N/A	\$57,182	\$4,037
Total				\$232,965	\$17,100

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$869,514
b. Normal cost at December 31, 2015 (excluding assumed expenses)	7,449
c. Benefit payments during 2016	(56,883)
d. Interest at 7.50% to December 31, 2016	63,360
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	883,440
f. Change in actuarial accrued liability due to assumption, method, and plan changes	27,222
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	910,662
2. Actuarial accrued liability at December 31, 2016	945,005
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(34,343)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	693,501
b. Contributions for 2016 ¹	9,762
c. Benefit payments and expenses during 2016	(57,365)
d. Interest at 7.50% to December 31, 2016	50,227
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	696,125
5. Actuarial value of assets at December 31, 2016	712,040
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	15,915
7. Total actuarial gain/(loss) (3. + 6.)	(\$18,428)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$176,013
2. Expected increase	11,302
3. Liability (gain)/loss	34,343
4. Asset (gain)/loss	(15,915)
5. Change due to changes in assumptions, methods, and plan provisions	27,222
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$232,965

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	0	0	0.00%	7,810	51,510	15.16%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	0	0	0.00%	0	0	0.00%
Total	\$0	\$0	16.95%	\$7,810	\$51,510	15.16%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$232,965	\$176,013
2. Next year's Tier 1/Tier 2 UAL payment	17,100	12,915
3. Combined valuation payroll	83,925	119,198
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	20.38%	10.83%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	16.95%	15.16%
b. Tier 1/Tier 2 UAL rate	20.38%	10.83%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	37.47%	26.14%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	18.42%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	18.42%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.68%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.68%
c. Funded percentage	75%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.68%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	14.74%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	22.10%
7. Advisory July 1, 2019 total pension rate, before adjustment	37.47%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(15.37%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	20.38%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	5.01%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	22.10%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	16.95%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	16.95%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	22.10%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	16.95%	15.16%
b. Tier 1/Tier 2 UAL rate	5.01%	3.11%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	22.10%	18.42%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$0	\$0
Tier 2	0	0	0
Tier 1/Tier 2 valuation payroll	0	0	0
OPSRP valuation payroll	83,925	0	83,925
Combined valuation payroll	\$83,925	\$0	\$83,925

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	0	2	2	1	0	2	3
Police & Fire	0	0	0	0	0	0	0	0
Total	0	0	2	2	1	0	2	3
Active Members with previous service segments with the employer								
General Service	0	0	N/A	0	0	0	N/A	0
Police & Fire	0	0	N/A	0	0	0	N/A	0
Total	0	0	N/A	0	0	0	N/A	0
Dormant Members								
General Service	1	0	2	3	0	0	2	2
Police & Fire	0	0	0	0	0	0	0	0
Total	1	0	2	3	0	0	2	2
Retired Members and Beneficiaries								
General Service	5	0	0	5	5	0	0	5
Police & Fire	1	0	0	1	1	0	0	1
Total	6	0	0	6	6	0	0	6
Grand Total Number of Members	7	0	4	11	7	0	4	11

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49										
50-54										
55-59										
60-64										
65-69										
70-74										
75+										
Total	0	0	0	0	0	0	0	0	0	0

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59	1	8
35-39			60-64	1	254
40-44			65-69	1	2,894
45-49			70-74	1	921
50-54			75-79	1	54
55-59			80-84		
60-64	1	1,566	85-89	1	273
65-69			90-94		
70-74			95-99		
75+			100+		
Total	1	1,566	Total	6	734

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Eagle Point/2282
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Eagle Point/2282

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Eagle Point/2282

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Eagle Point -- #2282

November 2017

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Executive Summary

Milliman has prepared this report for City of Eagle Point to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Eagle Point.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Eagle Point

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	17.89%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	5.65%	5.65%	5.65%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	25.10%	15.70%	20.43%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	25.59%	16.12%	20.85%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 64%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	17.83%	17.83%
Minimum 2019-2021 Rate	14.26%	10.69%
Maximum 2019-2021 Rate	21.40%	24.97%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$2,019,516	\$2,540,783	\$521,267	79%	\$689,745	76%
12/31/2012	2,240,662	2,683,723	443,061	83%	732,095	61%
12/31/2013	2,361,983	2,848,056	486,073	83%	634,485	77%
12/31/2014	2,394,813	3,386,913	992,100	71%	773,505	128%
12/31/2015	2,329,063	3,480,090	1,151,027	67%	737,638	156%
12/31/2016	2,409,771	3,759,229	1,349,458	64%	802,032	168%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Eagle Point

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$1,349,458	\$1,151,027
Allocated pooled OPSRP UAL	138,080	104,866
Side account	0	0
Net unfunded pension actuarial accrued liability	1,487,538	1,255,893
Combined valuation payroll	802,032	737,638
Net pension UAL as a percentage of payroll	185%	170%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$109)	\$3,582

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$69,424	\$63,597
Tier 1/Tier 2 valuation payroll	387,990	371,665
Tier 1/Tier 2 pension normal cost rate	17.89%	17.11%
Tier 1/ Tier 2 Actuarial accrued liability	\$3,759,229	\$3,480,090
Actuarial asset value	2,409,771	2,329,063
Tier 1/Tier 2 Unfunded actuarial accrued liability	1,349,458	1,151,027
Tier 1/ Tier 2 Funded status	64%	67%
Combined valuation payroll	\$802,032	\$737,638
Tier 1/Tier 2 UAL as a percentage of payroll	168%	156%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	5.65%	0.72%
Tier 1/Tier 2 active members ¹	5	5
Tier 1/Tier 2 dormant members	1	1
Tier 1/Tier 2 retirees and beneficiaries	10	10

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	802,032	737,638
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$71,120	\$67,608
2. Employer reserves	1,289,629	1,151,455
3. Benefits in force reserve	1,049,023	1,110,000
4. Total market value of assets (1. + 2. + 3.)	\$2,409,771	\$2,329,063

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$2,329,063
2. Regular employer contributions	52,942
3. Benefit payments and expenses	(205,393)
4. Adjustments ¹	70,240
5. Interest credited	162,920
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$2,409,771

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$13,881	\$12,540
Tier 1 General Service	0	0
Tier 2 Police & Fire	55,543	51,057
Tier 2 General Service	0	0
Total	\$69,424	\$63,597

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$66,729	\$69,424	\$2,695

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$197,920	\$158,009
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	1,083,886	925,378
▪ Tier 2 General Service	0	0
▪ Total Active Members	\$1,281,806	\$1,083,387
Dormant Members	0	0
Retired Members and Beneficiaries	2,477,423	2,396,703
Total Actuarial Accrued Liability	\$3,759,229	\$3,480,090

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$3,647,081	\$3,759,229	\$112,148

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$3,759,229	\$3,480,090
2. Actuarial value of assets	2,409,771	2,329,063
3. Unfunded accrued liability (1. – 2.)	1,349,458	1,151,027
4. Funded percentage (2. ÷ 1.)	64%	67%
5. Combined valuation payroll	\$802,032	\$737,638
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	168%	156%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$485,698	\$37,765	\$34,919	\$482,852	\$38,267
December 31, 2015	\$665,329	\$48,142	\$47,976	\$665,163	\$48,673
December 31, 2016	N/A	N/A	N/A	\$201,443	\$14,223
Total				\$1,349,458	\$101,163

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$3,480,090
b. Normal cost at December 31, 2015 (excluding assumed expenses)	60,655
c. Benefit payments during 2016	(203,666)
d. Interest at 7.50% to December 31, 2016	255,644
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	3,592,723
f. Change in actuarial accrued liability due to assumption, method, and plan changes	112,148
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	3,704,871
2. Actuarial accrued liability at December 31, 2016	3,759,229
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(54,358)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	2,329,063
b. Contributions for 2016 ¹	52,942
c. Benefit payments and expenses during 2016	(205,393)
d. Interest at 7.50% to December 31, 2016	168,963
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	2,345,574
5. Actuarial value of assets at December 31, 2016	2,409,771
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	64,197
7. Total actuarial gain/(loss) (3. + 6.)	\$9,839

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$1,151,027
2. Expected increase	96,122
3. Liability (gain)/loss	54,358
4. Asset (gain)/loss	(64,197)
5. Change due to changes in assumptions, methods, and plan provisions	112,148
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$1,349,458

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$13,881	\$77,195	17.98%	\$12,540	\$73,148	17.14%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	55,543	310,795	17.87%	51,057	298,517	17.10%
Tier 2 General Service	0	0	0.00%	0	0	0.00%
Total	\$69,424	\$387,990	17.89%	\$63,597	\$371,665	17.11%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$1,349,458	\$1,151,027
2. Next year's Tier 1/Tier 2 UAL payment	101,163	85,907
3. Combined valuation payroll	802,032	737,638
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	12.61%	11.65%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.89%	17.11%
b. Tier 1/Tier 2 UAL rate	12.61%	11.65%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	30.64%	28.91%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	17.83%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	17.83%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.57%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.57%
c. Funded percentage	64%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	5.71%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	12.12%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	23.54%
7. Advisory July 1, 2019 total pension rate, before adjustment	30.64%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(7.10%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	12.61%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	5.51%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	23.54%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	17.89%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	17.89%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	23.54%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.89%	17.11%
b. Tier 1/Tier 2 UAL rate	5.51%	0.57%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	23.54%	17.83%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$77,195	\$77,195
Tier 2	0	310,795	310,795
Tier 1/Tier 2 valuation payroll	0	387,990	387,990
OPSRP valuation payroll	0	414,042	414,042
Combined valuation payroll	\$0	\$802,032	\$802,032

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	0	0	0	0	0	0	0
Police & Fire	1	4	6	11	1	4	5	10
Total	1	4	6	11	1	4	5	10
Active Members with previous service segments with the employer								
General Service	0	0	N/A	0	0	0	N/A	0
Police & Fire	0	1	N/A	1	0	1	N/A	1
Total	0	1	N/A	1	0	1	N/A	1
Dormant Members								
General Service	0	0	0	0	0	0	0	0
Police & Fire	0	1	0	1	0	1	0	1
Total	0	1	0	1	0	1	0	1
Retired Members and Beneficiaries								
General Service	0	0	0	0	0	0	0	0
Police & Fire	9	1	0	10	9	1	0	10
Total	9	1	0	10	9	1	0	10
Grand Total Number of Members	10	7	6	23	10	7	5	22

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39			1							1
40-44					1					1
45-49			1	1						2
50-54				1						1
55-59										
60-64										
65-69										
70-74										
75+										
Total	0	0	2	2	1	0	0	0	0	5

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64	4	1,565
40-44			65-69	3	1,153
45-49	1	0	70-74	2	2,039
50-54			75-79		
55-59			80-84	1	632
60-64			85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total	1	0	Total	10	1,443

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Eugene/2111
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Eugene/2111

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Eugene/2111

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Eugene -- #2111

November 2017

Secondary Employers

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Executive Summary

Milliman has prepared this report for City of Eugene to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Eugene.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Eugene

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	17.35%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	6.21%	6.21%	6.21%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	25.12%	16.26%	20.99%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	25.61%	16.68%	21.41%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 74%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	19.63%	19.63%
Minimum 2019-2021 Rate	15.70%	11.77%
Maximum 2019-2021 Rate	23.56%	27.49%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$592,998,990	\$719,826,602	\$126,827,612	82%	\$95,549,026	133%
12/31/2012	647,467,866	707,760,655	60,292,789	91%	94,530,650	64%
12/31/2013	706,786,096	731,023,275	24,237,179	97%	90,070,653	27%
12/31/2014	720,594,457	864,959,317	144,364,860	83%	95,307,300	151%
12/31/2015	697,822,159	897,120,008	199,297,849	78%	102,849,280	194%
12/31/2016	703,023,361	944,825,938	241,802,577	74%	103,139,916	234%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Eugene

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$241,802,577	\$199,297,849
Allocated pooled OPSRP UAL	17,756,794	14,621,459
Side account	0	0
Net unfunded pension actuarial accrued liability	259,559,371	213,919,308
Combined valuation payroll	103,139,916	102,849,280
Net pension UAL as a percentage of payroll	252%	208%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$14,043)	\$499,401

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$9,123,475	\$9,561,203
Tier 1/Tier 2 valuation payroll	52,584,300	56,358,140
Tier 1/Tier 2 pension normal cost rate	17.35%	16.97%
Tier 1/ Tier 2 Actuarial accrued liability	\$944,825,938	\$897,120,008
Actuarial asset value	703,023,361	697,822,159
Tier 1/Tier 2 Unfunded actuarial accrued liability	241,802,577	199,297,849
Tier 1/ Tier 2 Funded status	74%	78%
Combined valuation payroll	\$103,139,916	\$102,849,280
Tier 1/Tier 2 UAL as a percentage of payroll	234%	194%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	6.21%	2.66%
Tier 1/Tier 2 active members ¹	623	684
Tier 1/Tier 2 dormant members	359	343
Tier 1/Tier 2 retirees and beneficiaries	1,705	1,647

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	103,139,916	102,849,280
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$64,082,094	\$69,134,416
2. Employer reserves	363,462,551	346,731,014
3. Benefits in force reserve	275,478,717	281,956,729
4. Total market value of assets (1. + 2. + 3.)	\$703,023,361	\$697,822,159

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$697,822,159
2. Regular employer contributions	9,960,516
3. Benefit payments and expenses	(53,937,366)
4. Adjustments ¹	773,503
5. Interest credited	48,404,549
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$703,023,361

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$2,116,726	\$2,290,525
Tier 1 General Service	2,405,921	2,684,012
Tier 2 Police & Fire	2,468,638	2,337,505
Tier 2 General Service	2,132,190	2,249,161
Total	\$9,123,475	\$9,561,203

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$8,889,017	\$9,123,475	\$234,458

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$65,876,083	\$69,652,260
▪ Tier 1 General Service	85,471,595	88,305,808
▪ Tier 2 Police & Fire	47,736,074	42,191,943
▪ Tier 2 General Service	52,641,403	49,700,228
▪ Total Active Members	\$251,725,155	\$249,850,239
Dormant Members	42,516,574	38,471,208
Retired Members and Beneficiaries	650,584,209	608,798,561
Total Actuarial Accrued Liability	\$944,825,938	\$897,120,008

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$919,919,873	\$944,825,938	\$24,906,065

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$944,825,938	\$897,120,008
2. Actuarial value of assets	703,023,361	697,822,159
3. Unfunded accrued liability (1. – 2.)	241,802,577	199,297,849
4. Funded percentage (2. ÷ 1.)	74%	78%
5. Combined valuation payroll	\$103,139,916	\$102,849,280
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	234%	194%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$24,218,482	\$1,883,095	\$1,741,154	\$24,076,541	\$1,908,111
December 31, 2015	\$175,079,367	\$12,668,550	\$12,624,830	\$175,035,647	\$12,808,111
December 31, 2016	N/A	N/A	N/A	\$42,690,389	\$3,014,219
Total				\$241,802,577	\$17,730,441

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$897,120,008
b. Normal cost at December 31, 2015 (excluding assumed expenses)	9,118,511
c. Benefit payments during 2016	(53,483,788)
d. Interest at 7.50% to December 31, 2016	65,620,303
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	918,375,034
f. Change in actuarial accrued liability due to assumption, method, and plan changes	24,906,065
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	943,281,099
2. Actuarial accrued liability at December 31, 2016	944,825,938
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(1,544,839)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	697,822,159
b. Contributions for 2016 ¹	9,960,516
c. Benefit payments and expenses during 2016	(53,937,366)
d. Interest at 7.50% to December 31, 2016	50,687,530
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	704,532,839
5. Actuarial value of assets at December 31, 2016	703,023,361
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(1,509,478)
7. Total actuarial gain/(loss) (3. + 6.)	(\$3,054,317)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$199,297,849
2. Expected increase	14,544,346
3. Liability (gain)/loss	1,544,839
4. Asset (gain)/loss	1,509,478
5. Change due to changes in assumptions, methods, and plan provisions	24,906,065
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$241,802,577

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$2,116,726	\$9,722,379	21.77%	\$2,290,525	\$10,563,644	21.68%
Tier 1 General Service	2,405,921	13,392,398	17.96%	2,684,012	15,013,560	17.88%
Tier 2 Police & Fire	2,468,638	13,194,805	18.71%	2,337,505	13,040,320	17.93%
Tier 2 General Service	2,132,190	16,274,718	13.10%	2,249,161	17,740,616	12.68%
Total	\$9,123,475	\$52,584,300	17.35%	\$9,561,203	\$56,358,140	16.97%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$241,802,577	\$199,297,849
2. Next year's Tier 1/Tier 2 UAL payment	17,730,441	14,551,645
3. Combined valuation payroll	103,139,916	102,849,280
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	17.19%	14.15%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.35%	16.97%
b. Tier 1/Tier 2 UAL rate	17.19%	14.15%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	34.68%	31.27%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	19.63%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	19.63%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	3.93%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.93%
c. Funded percentage	74%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.93%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	15.70%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	23.56%
7. Advisory July 1, 2019 total pension rate, before adjustment	34.68%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(11.12%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	17.19%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	6.07%
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	23.56%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	17.35%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	17.35%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	23.56%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.35%	16.97%
b. Tier 1/Tier 2 UAL rate	6.07%	2.51%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	23.56%	19.63%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$13,392,398	\$9,722,379	\$23,114,777
Tier 2	16,274,718	13,194,805	29,469,523
Tier 1/Tier 2 valuation payroll	29,667,116	22,917,184	52,584,300
OPSRP valuation payroll	35,810,401	14,745,215	50,555,616
Combined valuation payroll	\$65,477,517	\$37,662,399	\$103,139,916

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	185	248	690	1,123	212	267	636	1,115
Police & Fire	75	115	153	343	89	116	134	339
Total	260	363	843	1,466	301	383	770	1,454
Active Members with previous service segments with the employer								
General Service	132	165	N/A	297	154	148	N/A	302
Police & Fire	11	15	N/A	26	12	15	N/A	27
Total	143	180	N/A	323	166	163	N/A	329
Dormant Members								
General Service	175	149	62	386	173	141	53	367
Police & Fire	18	17	5	40	13	16	4	33
Total	193	166	67	426	186	157	57	400
Retired Members and Beneficiaries								
General Service	1,188	98	16	1,302	1,127	107	14	1,248
Police & Fire	401	18	3	422	392	21	3	416
Total	1,589	116	19	1,724	1,519	128	17	1,664
Grand Total Number of Members	2,185	825	929	3,939	2,172	831	844	3,847

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34			1							1
35-39			23	8						31
40-44		2	36	35	14	1				88
45-49			22	62	38	7	1			130
50-54		1	23	36	40	19	11			130
55-59			12	32	37	20	13			114
60-64		1	14	29	23	20	9	4		100
65-69			1	12	2	4	3	1		23
70-74			2	3		1				6
75+										
Total	0	4	134	217	154	72	37	5	0	623

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45	6	1,156
20-24			45-49	12	1,753
25-29			50-54	22	3,616
30-34	4	139	55-59	101	2,599
35-39	17	903	60-64	335	2,816
40-44	43	968	65-69	508	2,570
45-49	55	754	70-74	336	2,441
50-54	67	1,005	75-79	179	2,219
55-59	71	1,049	80-84	120	1,854
60-64	55	1,734	85-89	48	1,740
65-69	28	478	90-94	32	1,323
70-74	13	663	95-99	5	1,099
75+	6	304	100+	1	350
Total	359	1,003	Total	1,705	2,458

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City Of Forest Grove/2112
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City Of Forest Grove/2112

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City Of Forest Grove/2112

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City Of Forest Grove -- #2112

November 2017

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Executive Summary

Milliman has prepared this report for City Of Forest Grove to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City Of Forest Grove.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City Of Forest Grove

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	17.08%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	0.54%	0.54%	0.54%
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	19.18%	10.59%	15.32%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	19.67%	11.01%	15.74%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is -143%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	N/A	N/A
Minimum 2019-2021 Rate	N/A	N/A
Maximum 2019-2021 Rate	N/A	N/A

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	(\$9,441)	\$1,116	\$10,557	(846%)	\$0	0%
12/31/2012	(10,877)	1,046	11,923	(1040%)	0	0%
12/31/2013	(12,656)	1,022	13,678	(1238%)	0	0%
12/31/2014	(13,690)	1,099	14,789	(1246%)	0	0%
12/31/2015	(14,044)	1,068	15,112	(1315%)	0	0%
12/31/2016	(11,821)	8,276	20,097	(143%)	388,806	5%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City Of Forest Grove

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$20,097	\$15,112
Allocated pooled OPSRP UAL	66,938	0
Side account	0	0
Net unfunded pension actuarial accrued liability	87,035	15,112
Combined valuation payroll	388,806	0
Net pension UAL as a percentage of payroll	22%	0%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$53)	\$0

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer’s combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$20,255	\$0
Tier 1/Tier 2 valuation payroll	118,597	0
Tier 1/Tier 2 pension normal cost rate	17.08%	5.85%
Tier 1/ Tier 2 Actuarial accrued liability	\$8,276	\$1,068
Actuarial asset value	(11,821)	(14,044)
Tier 1/Tier 2 Unfunded actuarial accrued liability	20,097	15,112
Tier 1/ Tier 2 Funded status	(143%)	(1315%)
Combined valuation payroll	\$388,806	\$0
Tier 1/Tier 2 UAL as a percentage of payroll	5%	0%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	0.54%	0.15%
Tier 1/Tier 2 active members ¹	1	0
Tier 1/Tier 2 dormant members	0	0
Tier 1/Tier 2 retirees and beneficiaries	0	1

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	388,806	0
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$0	\$0
2. Employer reserves	(11,821)	(14,538)
3. Benefits in force reserve	0	494
4. Total market value of assets (1. + 2. + 3.)	(\$11,821)	(\$14,044)

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	(\$14,044)
2. Regular employer contributions	3,804
3. Benefit payments and expenses	0
4. Adjustments ¹	(816)
5. Interest credited	(765)
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	(\$11,821)

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	0	0
Tier 2 Police & Fire	20,255	0
Tier 2 General Service	0	0
Total	\$20,255	\$0

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$19,373	\$20,255	\$882

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	8,276	0
▪ Tier 2 General Service	0	0
▪ Total Active Members	\$8,276	\$0
Dormant Members	0	0
Retired Members and Beneficiaries	0	1,068
Total Actuarial Accrued Liability	\$8,276	\$1,068

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$7,987	\$8,276	\$289

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$8,276	\$1,068
2. Actuarial value of assets	(11,821)	(14,044)
3. Unfunded accrued liability (1. – 2.)	20,097	15,112
4. Funded percentage (2. ÷ 1.)	(143%)	(1315%)
5. Combined valuation payroll	\$388,806	\$0
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	5%	0%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$13,667	\$1,063	\$983	\$13,587	\$1,077
December 31, 2015	\$1,445	\$105	\$104	\$1,444	\$106
December 31, 2016	N/A	N/A	N/A	\$5,066	\$358
Total				\$20,097	\$1,541

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$1,068
b. Normal cost at December 31, 2015 (excluding assumed expenses)	0
c. Benefit payments during 2016	0
d. Interest at 7.50% to December 31, 2016	80
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	1,148
f. Change in actuarial accrued liability due to assumption, method, and plan changes	289
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	1,437
2. Actuarial accrued liability at December 31, 2016	8,276
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(6,839)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	(14,044)
b. Contributions for 2016 ¹	3,804
c. Benefit payments and expenses during 2016	0
d. Interest at 7.50% to December 31, 2016	(911)
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	(11,150)
5. Actuarial value of assets at December 31, 2016	(11,821)
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	(671)
7. Total actuarial gain/(loss) (3. + 6.)	(\$7,510)

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$15,112
2. Expected increase	(2,814)
3. Liability (gain)/loss	6,839
4. Asset (gain)/loss	671
5. Change due to changes in assumptions, methods, and plan provisions	289
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$20,097

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	0	0	0.00%	0	0	0.00%
Tier 2 Police & Fire	20,255	118,597	17.08%	0	0	0.00%
Tier 2 General Service	0	0	0.00%	0	0	0.00%
Total	\$20,255	\$118,597	17.08%	\$0	\$0	17.01%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$20,097	\$15,112
2. Next year's Tier 1/Tier 2 UAL payment	1,541	1,168
3. Combined valuation payroll	388,806	0
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	0.40%	0.00%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.08%	16.71%
b. Tier 1/Tier 2 UAL rate	0.40%	0.00%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	17.62%	16.86%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	17.62%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	17.62%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	N/A
b. Preliminary size of rate collar (maximum of 3% or a.)	N/A
c. Funded percentage	N/A
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	N/A
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	N/A
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	N/A
7. Advisory July 1, 2019 total pension rate, before adjustment	N/A
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	N/A
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	N/A
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	N/A
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	N/A
12. Tier 1/Tier 2 retiree healthcare rate	N/A
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	N/A
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	N/A
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	N/A
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	N/A

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	17.08%	16.71%
b. Tier 1/Tier 2 UAL rate	0.40%	0.00%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	17.62%	16.86%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$0	\$0	\$0
Tier 2	0	118,597	118,597
Tier 1/Tier 2 valuation payroll	0	118,597	118,597
OPSRP valuation payroll	0	270,209	270,209
Combined valuation payroll	\$0	\$388,806	\$388,806

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	0	0	0	0	0	0	0
Police & Fire	0	1	4	5	0	0	0	0
Total	0	1	4	5	0	0	0	0
Active Members with previous service segments with the employer								
General Service	0	0	N/A	0	0	0	N/A	0
Police & Fire	0	0	N/A	0	0	0	N/A	0
Total	0	0	N/A	0	0	0	N/A	0
Dormant Members								
General Service	0	0	0	0	0	0	0	0
Police & Fire	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
Retired Members and Beneficiaries								
General Service	0	0	0	0	1	0	0	1
Police & Fire	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1
Grand Total Number of Members	0	1	4	5	1	0	0	1

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39				1						1
40-44										
45-49										
50-54										
55-59										
60-64										
65-69										
70-74										
75+										
Total	0	0	0	1	0	0	0	0	0	1

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64		
40-44			65-69		
45-49			70-74		
50-54			75-79		
55-59			80-84		
60-64			85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total			Total		

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called "funding method," a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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This work product was prepared solely for Oregon Public Employees Retirement System for the purposes stated herein, and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

November 2017

City of Fossil/2248
Oregon Public Employees Retirement System

Dear Sir or Madam:

As part of our engagement with the Oregon Public Employees Retirement Board, we performed a system-wide actuarial valuation of the Oregon Public Employees Retirement System (“PERS” or “the System”) as of December 31, 2016. Information is also provided to assist you in preparing your required financial reporting disclosures under Statement 45 of the Governmental Accounting Standards Board. GASB 68 information will be provided separately by PERS and is not included in this report.

This valuation is advisory and does not affect employer contribution rates. Employer contribution rates effective July 1, 2019 through June 30, 2021 will be calculated in the December 31, 2017 actuarial valuation.

This report reflects the System's benefit provisions in effect as of December 31, 2016. The full development of the valuation results for the OPSRP and Retiree Health Insurance Account (RHIA) programs can be found in the separate system-wide actuarial valuation report. Costs of the IAP (Individual Account Program) are not included in this or the system-wide actuarial valuation report. Further, costs of pension obligation bond payments are not included in this or the system-wide actuarial valuation report.

If you have any questions about this report, please contact Debra Hembree, Actuarial Services Coordinator at Oregon PERS, at 503 603 7704 or Debra.Hembree@state.or.us.

Contents of Report

The executive summary provides the basic information you need including:

- Contribution rates for Tier 1/Tier 2, OPSRP general service, and OPSRP police and fire payroll,
- Information to assist you in completing GASB 45 financial reporting requirements, and
- A summary of principal valuation results.

The remainder of the report provides additional information including:

- Side account balances, transactions and rate relief,
- Detailed development of Tier 1/Tier 2 valuation results,
- A brief summary of methods and assumptions, and
- A brief summary of any changes in System benefit provisions.

Additional information is provided in the system-wide actuarial valuation report, which is available at www.oregon.gov/PERS/Pages/Financials/Actuarial-Financial-Information.aspx.



November 2017
City of Fossil/2248

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, System benefit provisions as defined by statute, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting the System.

A valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While a valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: System experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in System benefit provisions or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in July 2017.

Some of the actuarial computations presented in this report are for purposes of estimating the contribution rates effective from July 2019 to June 2021 for System employers. Other actuarial computations presented in this report under GASB Statement No. 45 are for purposes of assisting System employers in fulfilling their financial reporting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the System benefit provisions described in the appendixes of this report, and of GASB Statement No. 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



November 2017
City of Fossil/2248

This report is prepared solely for the use and benefit of the Oregon Public Employees Retirement System, the employer named above, or its auditors solely for the purpose of completing an audit related to the matters herein. To the extent that this report is not subject to disclosure under applicable public records laws, it may not be provided to other third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of this report. Milliman's consent to release this report to any third party may be conditioned on the third party signing a release except for situations where such release is prohibited by law.

No third party recipient of this report should rely upon Milliman's work contained herein. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the System. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Additional information is provided in the system-wide actuarial valuation report.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Scott Preppernau".

Scott Preppernau, FSA, EA, MAAA
Principal and Consulting Actuary



ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

INDEPENDENT EMPLOYERS

City of Fossil -- #2248

November 2017

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Executive Summary

Milliman has prepared this report for City of Fossil to:

- Provide summary December 31, 2016 valuation results for the Oregon Public Service Retirement Plan (OPSRP) and the Retiree Health Insurance Account (RHIA),
- Provide advisory information calculated as of December 31, 2016 on estimated employer-specific contribution rates effective July 1, 2019 through June 30, 2021,
- Provide employer-specific valuation results for side accounts and Tier 1/Tier 2 assets and liabilities as of December 31, 2016, and
- Provide reporting and disclosure information for financial statements for governmental agencies and pursuant to GASB Statement Number 45. GASB 68 information will be provided separately by PERS and is not included in this report.

This report summarizes the valuation results for the OPSRP and RHIA. The full development of these results can be found in the December 31, 2016 system-wide actuarial valuation report. This report develops employer-specific Tier 1/Tier 2 and side account rates and applies the results from the system-wide valuation to City of Fossil.

Employer Contribution Rates

The following table summarizes the employer contribution rates calculated as of December 31, 2016 for each type of payroll. There are separate normal cost rates for each of the payrolls based on the benefit structure supported by that payroll. The other rates apply to all payrolls regardless of the benefit structure to which they are attributed.

Advisory 2019 - 2021 Employer Rates Calculated as of December 31, 2016 for City of Fossil

	Payroll		
	Tier 1/Tier 2	OPSRP	
		General Service	Police & Fire
Pension			
Normal cost rate	14.45%	8.49%	13.22%
Tier 1/Tier 2 UAL rate ¹	(0.04%)	(0.04%)	(0.04%)
OPSRP UAL rate	1.56%	1.56%	1.56%
Side account rate relief	0.00%	0.00%	0.00%
Net pension contribution rate	15.97%	10.01%	14.74%
Retiree Healthcare			
Normal cost rate	0.07%	0.00%	0.00%
UAL rate	0.42%	0.42%	0.42%
Net retiree healthcare rate	0.49%	0.42%	0.42%
Total net employer contribution rate	16.46%	10.43%	15.16%

In this report, the payroll of Tier 1 and Tier 2 members is referred to as Tier 1/Tier 2 valuation payroll. Combined valuation payroll refers to the payroll for Tier 1/Tier 2 members, OPSRP general service members and OPSRP police and fire members.

¹ Includes Multnomah Fire District #10 rate.

Executive Summary

Employer Contribution Rates (continued)

Range of Potential Tier 1/Tier 2 Employer Pension Contribution Rates for the July 2019 to June 2021 Biennium

The rate collar limits changes in contribution rates, but does not limit changes in rates for individual employers related to side accounts. The table below shows the possible minimum and maximum rates first effective as of July 1, 2019, which will depend on the funded status as of December 31, 2017. If the employer's funded status excluding side accounts is less than 60 percent or greater than 140 percent, the rate collar doubles in size. If the employer's funded status excluding side accounts is between 60 and 70 percent or between 130 and 140 percent, the size of the rate collar is increased on a graded scale. Also, please note that by Board policy, independent employers with less than 2,500 employees cannot have a Tier 1/Tier 2 pension rate less than 6 percent of payroll (excludes side accounts and OPSRP UAL rates). The rates shown are before any adjustment for side account offsets or the 6 percent minimum independent employer contribution rate.

For comparison, the funded status as of December 31, 2016 is 73%.

Funded Status as of December 31, 2017	70% to 130%	Under 60% or Over 140%
2017-2019 Normal Cost + Tier 1/Tier 2 UAL Rate	11.41%	11.41%
Minimum 2019-2021 Rate	8.41%	5.41%
Maximum 2019-2021 Rate	14.41%	17.41%

Executive Summary

Accounting Information

Milliman is not an accounting or audit firm and cannot provide accounting advice. Milliman is not responsible for the interpretation of, or compliance with, accounting standards; citations to, and descriptions of accounting standards provided in this report are for reference purposes only. The information provided in this section is intended to assist the employer in completing its financial statements, but any accounting determination should be reviewed by your auditor.

Pension

In June 2012 the GASB issued Statement No. 68, which replaced GASB 27 and governs employer financial reporting for fiscal years beginning after June 15, 2014. The new standard replaced many of the key elements of the prior reporting requirements. Under the new rules, employers are required to record a balance sheet liability for their unfunded pension obligations. In addition, the timing and coordination of plan and employer reporting has changed under the new requirements. GASB 68 information for employers will be provided separately by PERS and is not included in this report.

Schedule of Funding Progress

Under GASB 27, the Schedule of Funding Progress for Tier 1/Tier 2 pension liabilities was reported in the Required Supplementary Information. This schedule is no longer required now that GASB 68 has replaced GASB 27. However, for additional information and the sake of historical comparison, the updated schedule is shown below for the last several valuations. For employers with side accounts, the actuarial value of assets in this Schedule includes the value of the employer's side accounts.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b - a)	Funded Ratio (a ÷ b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) ÷ c)
12/31/2011	\$579,010	\$654,449	\$75,439	88%	\$94,788	80%
12/31/2012	499,500	562,282	62,782	89%	69,765	90%
12/31/2013	544,706	567,476	22,770	96%	75,460	30%
12/31/2014	485,723	569,684	83,961	85%	77,810	108%
12/31/2015	443,152	582,368	139,216	76%	79,984	174%
12/31/2016	446,622	611,917	165,295	73%	85,351	194%

Executive Summary

Accounting Information (continued)

Retiree Healthcare

The Retiree Health Insurance Account (RHIA) is a cost-sharing pool under Statement No. 45 of the Governmental Accounting Standards Board (GASB 45). Consequently, each employer reports the contractually required contribution. The contractually required contribution for retiree healthcare liabilities for the period July 1, 2017 through June 30, 2019 was calculated as a part of the December 31, 2015 valuation, and is expressed as contribution rates that are applied to the appropriate payroll. The rates and appropriate payroll are shown in the table below.

Contractually Required Contribution Rate

	Payroll		
	Tier 1 / Tier 2	OPSRP	
		General Service	Police & Fire
July 1, 2015 to June 30, 2017	0.53%	0.45%	0.45%
July 1, 2017 to June 30, 2019	0.50%	0.43%	0.43%

In June 2015, the GASB issued Statement 75, which will replace GASB 45 and govern employer financial reporting for retiree healthcare obligations for fiscal years beginning after June 15, 2017. In general, the changes required by GASB 75 parallel those that occurred for pension reporting when GASB 68 replaced GASB 27. Accounting information for reporting under GASB 75 will be provided separately and is not included in this report.

Executive Summary

Principal Valuation Results

A summary of principal valuation results from the current valuation and the prior valuation follows. Any changes in actuarial assumptions, methods or plan provisions between the two valuations are described later in this report. More detailed information can be found in the system-wide actuarial valuation report.

City of Fossil

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
T1/T2 UAL	\$165,295	\$139,216
Allocated pooled OPSRP UAL	14,694	11,371
Side account	0	0
Net unfunded pension actuarial accrued liability	179,989	150,587
Combined valuation payroll	85,351	79,984
Net pension UAL as a percentage of payroll	211%	188%
Calculated side account rate relief	0.00%	0.00%
Allocated pooled RHIA UAL	(\$12)	\$388

In the above exhibit, UAL amounts for the pools (OPSRP and RHIA) are allocated pro-rata based on the ratio of an employer's combined valuation payroll to that of the applicable pool. Pool total results are summarized on page 7 of this report. Allocated amounts shown above differ from the proportionate share of Net Pension Liability (NPL) that will be allocated to employers under GASB 68.

Executive Summary

Principal Valuation Results (continued)

Tier 1/Tier 2

	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
Normal cost	\$6,279	\$5,599
Tier 1/Tier 2 valuation payroll	43,451	40,451
Tier 1/Tier 2 pension normal cost rate	14.45%	13.84%
Tier 1/ Tier 2 Actuarial accrued liability	\$611,917	\$582,368
Actuarial asset value	446,622	443,152
Tier 1/Tier 2 Unfunded actuarial accrued liability	165,295	139,216
Tier 1/ Tier 2 Funded status	73%	76%
Combined valuation payroll	\$85,351	\$79,984
Tier 1/Tier 2 UAL as a percentage of payroll	194%	174%
Tier 1/Tier 2 UAL rate (includes Multnomah Fire District #10)	(0.04%)	(2.43%)
Tier 1/Tier 2 active members ¹	1	1
Tier 1/Tier 2 dormant members	0	0
Tier 1/Tier 2 retirees and beneficiaries	5	5

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Executive Summary

Principal Valuation Results (continued)

OPSRP

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
General service normal cost	\$402.9	\$342.2
OPSRP general service valuation payroll	4,746.4	4,266.9
General service normal cost rate	8.49%	8.02%
Police and fire normal cost	\$80.6	\$69.9
OPSRP police and fire valuation payroll	609.4	546.4
Police and fire normal cost rate	13.22%	12.79%
Actuarial accrued liability	\$4,717.0	\$3,742.5
Actuarial asset value	3,021.4	2,389.1
Unfunded actuarial accrued liability	1,695.6	1,353.5
Funded status	64%	64%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	17%	14%
UAL rate	1.56%	1.27%

Retiree Healthcare

(\$ in millions)	Actuarial Valuation as of	
	December 31, 2016	December 31, 2015
RHIA		
Normal cost	\$3.0	\$3.3
Tier 1 / Tier 2 valuation payroll	4,516.7	4,730.8
Normal cost rate	0.07%	0.07%
Actuarial accrued liability	\$463.7	\$465.6
Actuarial asset value	465.0	419.3
Unfunded actuarial accrued liability	(1.3)	46.3
Funded status	100%	90%
Combined valuation payroll	\$9,872.6	\$9,544.1
UAL as a percentage of payroll	0%	0%
UAL rate	0.42%	0.43%

Side Account Information

Reconciliation of Side Accounts

The following table reconciles the total side account from the beginning of the year to the end of the year. Side account transfers were calculated by PERS and made on a monthly basis. The amount of these transfers is shown in the table below.

All information in this table has been provided by PERS.

	New	Continuing	Total
1. Side account as of December 31, 2015	N/A		
2. Deposits made during 2016		N/A	
3. Administrative expenses			
4. Amount transferred to employer reserves during 2016			
5. Side account earnings during 2016			
6. Side account as of December 31, 2016 (1. + 2. + 3. + 4. + 5.)			

Side Account Information

Side Account Balances

	December 31, 2016	December 31, 2015
Side account 1	\$0	\$0
Side account 2	0	0
Side account 3	0	0
Total	\$0	\$0

Development of Side Account Rate

The rate relief attributable to an employer's side account is determined by amortizing the side account balance on the valuation date over a fixed period, and expressing the result as a percentage of combined valuation payroll. For side accounts established prior to December 31, 2009, the fixed period ends December 31, 2027. For side accounts established at a later date, the fixed period ends 18 years after the first rate-setting valuation following its creation.

	December 31, 2016	December 31, 2015
1. Total side account	\$0	\$0
2. Combined valuation payroll	85,351	79,984
3. Average Amortization factor	8.994	9.504
4. Total side account rate (-1. ÷ 2. ÷ 3.)¹	0.00%	0.00%

¹ For employers with more than one side account, the Total Side Account Rate is determined by calculating the rate on each side account separately and adding the rates together.

Tier 1/Tier 2 Valuation Results

Assets

A summary of the market value of pension assets, and reconciliation from the prior year are shown below.

Summary of Market Value of Tier 1/Tier 2 Pension Assets

	December 31, 2016	December 31, 2015
1. Member reserves	\$0	\$0
2. Employer reserves	232,927	214,749
3. Benefits in force reserve	213,695	228,404
4. Total market value of assets (1. + 2. + 3.)	\$446,622	\$443,152

The market value of member and employer reserves is provided by PERS. The benefits in force reserve provided by PERS is allocated each year among employers in proportion to their liabilities for retired members and beneficiaries.

Reconciliation of Tier 1/Tier 2 Pension Assets

	December 31, 2015 to December 31, 2016
1. Market value of assets at beginning of year	\$443,152
2. Regular employer contributions	2,735
3. Benefit payments and expenses	(41,840)
4. Adjustments ¹	12,343
5. Interest credited	30,232
6. Total transferred from side accounts	0
7. Market value of assets at end of year (1. + 2. + 3. + 4. + 5. + 6.)	\$446,622

¹ Note the adjustment item above includes a reallocation of the benefits in force reserve, transfers to Multnomah Fire District #10, and other adjustments made by PERS.

Tier 1/Tier 2 Valuation Results

Liabilities

Normal Cost

The normal cost represents the value of benefits assigned to the next year of service by the actuarial cost method. If all actuarial assumptions are met, the normal cost represents the amount that would need to be contributed each year to fund plan benefits. Amounts shown below include assumed administrative expenses, which are allocated pro-rata based on normal cost.

Summary of Normal Cost by Tier/Member Classification

	December 31, 2016	December 31, 2015
Tier 1 Police & Fire	\$0	\$0
Tier 1 General Service	78	0
Tier 2 Police & Fire	0	0
Tier 2 General Service	6,201	5,599
Total	\$6,279	\$5,599

Change in Tier 1/Tier 2 Normal Cost

The following table shows the impact of the assumption, method, and plan changes on normal cost as of December 31, 2016.

	Before Changes	After Changes	Net Change
Normal Cost	\$6,039	\$6,279	\$240

Tier 1/Tier 2 Valuation Results

Liabilities

Actuarial Accrued Liability

The actuarial accrued liability represents the value of benefits allocated to service performed before the valuation date by the actuarial cost method. If all actuarial assumptions are met, the actuarial accrued liability represents the amount of assets that would need to be accumulated as of the valuation date to provide for the portion of benefits allocated to service already performed.

Summary of Actuarial Accrued Liability by Tier/Member Classification

	December 31, 2016	December 31, 2015
Active Members		
▪ Tier 1 Police & Fire	\$0	\$0
▪ Tier 1 General Service	0	0
▪ Tier 2 Police & Fire	0	0
▪ Tier 2 General Service	107,245	89,200
▪ Total Active Members	\$107,245	\$89,200
Dormant Members	0	0
Retired Members and Beneficiaries	504,672	493,168
Total Actuarial Accrued Liability	\$611,917	\$582,368

Change in Tier 1/Tier 2 Actuarial Accrued Liability

The following table shows the impact of the assumption, method, and plan changes on the actuarial accrued liability as of December 31, 2016.

	Before Changes	After Changes	Net Change
Actuarial Accrued Liability	\$595,177	\$611,917	\$16,740

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Summary of UAL

The UAL represents the difference between the assets accumulated and the liability attributed to prior years of service by the cost method.

	December 31, 2016	December 31, 2015
1. Actuarial accrued liability	\$611,917	\$582,368
2. Actuarial value of assets	446,622	443,152
3. Unfunded accrued liability (1. – 2.)	165,295	139,216
4. Funded percentage (2. ÷ 1.)	73%	76%
5. Combined valuation payroll	\$85,351	\$79,984
6. Unfunded accrued liability as % of combined valuation payroll (3. ÷ 5.)	194%	174%

Reconciliation of UAL Bases

Beginning with the December 31, 2013 actuarial valuation, each odd-year valuation establishes a 20-year closed-period amortization schedule for outstanding regular Tier 1/Tier 2 UAL amounts. For subsequent odd-year valuations, amortization schedules are calculated based on the total Tier 1/Tier 2 UAL as of that valuation date less the remaining unamortized balance of previously established Tier 1/Tier 2 UAL bases. This even-year advisory valuation shows an estimate of the amortization schedules to be established on December 31, 2017, with the estimate based on experience through the end of 2016. The payment schedules for the unamortized balances as of December 31, 2016 have been modified to reflect the lowering of the investment return assumption first effective with this valuation.

Amortization Base	UAL December 31, 2015	Payment	Interest	UAL December 31, 2016	Next Year's Payment
December 31, 2013	\$22,753	\$1,769	\$1,636	\$22,620	\$1,793
December 31, 2015	\$116,463	\$8,427	\$8,398	\$116,434	\$8,520
December 31, 2016	N/A	N/A	N/A	\$26,241	\$1,853
Total				\$165,295	\$12,166

Tier 1/Tier 2 Valuation Results

Unfunded Accrued Liability (UAL)

Actuarial Gain or Loss since Prior Valuation

The system-wide actuarial valuation report contains a detailed analysis of gains and losses since the last valuation. The table below shows the gain or loss for the individual employer.

1. Expected actuarial accrued liability	
a. Actuarial accrued liability at December 31, 2015	\$582,368
b. Normal cost at December 31, 2015 (excluding assumed expenses)	5,340
c. Benefit payments during 2016	(41,489)
d. Interest at 7.50% to December 31, 2016	42,322
e. Expected actuarial accrued liability before changes (a. + b. + c. + d.)	588,541
f. Change in actuarial accrued liability due to assumption, method, and plan changes	16,740
g. Expected actuarial accrued liability at December 31, 2016 (e. + f.)	605,281
2. Actuarial accrued liability at December 31, 2016	611,917
3. Gain/(loss) on actuarial accrued liability (1.g. - 2.)	(6,636)
4. Expected actuarial value of assets	
a. Actuarial value of assets at December 31, 2015	443,152
b. Contributions for 2016 ¹	2,735
c. Benefit payments and expenses during 2016	(41,840)
d. Interest at 7.50% to December 31, 2016	31,770
e. Expected actuarial value of assets at December 31, 2016 (a. + b. + c. + d.)	435,817
5. Actuarial value of assets at December 31, 2016	446,622
6. Gain/(loss) on actuarial value of assets (5. - 4.e.)	10,805
7. Total actuarial gain/(loss) (3. + 6.)	\$4,169

Unfunded Accrued Liability Reconciliation

A reconciliation of the Tier 1/Tier 2 UAL from December 31, 2015 is provided below.

1. UAL at December 31, 2015	\$139,216
2. Expected increase	13,508
3. Liability (gain)/loss	6,636
4. Asset (gain)/loss	(10,805)
5. Change due to changes in assumptions, methods, and plan provisions	16,740
6. UAL at December 31, 2016 (1. + 2. + 3. + 4. + 5.)	\$165,295

¹ Includes rate relief from side accounts.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Normal Cost Rate

For independent employers, the normal cost calculated previously is divided by projected payroll to determine a normal cost rate. The table below shows the development of the rate for each tier and member classification.

Development of Tier 1/Tier 2 Normal Cost Rate

	December 31, 2016			December 31, 2015		
	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate	Normal Cost	Employer Tier 1/Tier 2 Valuation Payroll	Normal Cost Rate
Tier 1 Police & Fire	\$0	\$0	0.00%	\$0	\$0	0.00%
Tier 1 General Service	78	494	15.79%	0	0	0.00%
Tier 2 Police & Fire	0	0	0.00%	0	0	0.00%
Tier 2 General Service	6,201	42,957	14.44%	5,599	40,451	13.84%
Total	\$6,279	\$43,451	14.45%	\$5,599	\$40,451	13.84%

An independent employer that has no Tier 1/Tier 2 active payroll will be assigned the weighted average normal cost of all independent employers as calculated in the system-wide actuarial valuation report.

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Development of Tier 1/Tier 2 UAL Rates

The UAL rate is determined by calculating the next year's scheduled payment to the UAL as a percentage of combined valuation payroll.

	December 31, 2016	December 31, 2015
1. Total Tier 1/Tier 2 UAL	\$165,295	\$139,216
2. Next year's Tier 1/Tier 2 UAL payment	12,166	10,196
3. Combined valuation payroll	85,351	79,984
4. Tier 1/Tier 2 UAL rate (2. ÷ 3.)	14.25%	12.75%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Pre-Rate Collar)

The following table summarizes the employer's pension contribution rate for Tier 1/Tier 2. The normal cost rates apply to Tier 1/Tier 2 payroll only, but all other rates apply to combined valuation payroll. These rates do not reflect adjustments due to the rate collar, the minimum 6 percent rate for independent employers with fewer than 2,500 members, or side accounts.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	14.45%	13.84%
b. Tier 1/Tier 2 UAL rate	14.25%	12.75%
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate (a. + b. + c.)	28.84%	26.74%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Adjustments Due to Rate Collar and Minimum Rate Requirements

Employer contribution rates are generally limited to change by no more than the greater of 3 percent of payroll or 20 percent from the current contribution rate. However, if the funded percentage excluding side accounts is below 60 percent or above 140 percent the rate collar doubles in size. If the funded percentage excluding side accounts is between 60 and 70 percent or 130 and 140 percent, the size of the collar is increased on a graded scale. In addition, for independent employers with less than 2,500 active members, the net employer Tier 1/Tier 2 contribution rate cannot be less than 6 percent of payroll. All collar and minimum rate calculations are performed prior to adjustments for side accounts and the OPSRP UAL rate.

The table below shows the current contribution rate for the period from July 1, 2017 through June 30, 2019, develops the maximum and minimum advisory contribution rates effective July 1, 2019 based on the collar, and calculates the net adjustment due to the collar and minimum independent employer contribution rate. The net adjustment due to the rate collar is applied to the UAL rate. The net adjustment due to the 6 percent minimum independent employer contribution rate is applied to the pension normal cost rate.

1. Current net Tier 1/Tier 2 pension contribution rate	11.41%
2. Employer contribution rate attributable to side accounts	0.00%
3. Current employer Tier 1/Tier 2 pension contribution rate (1. – 2.)	11.41%
4. Size of rate collar	
a. 20% of current employer contribution rate (20% x 3.)	2.28%
b. Preliminary size of rate collar (maximum of 3% or a.)	3.00%
c. Funded percentage	73%
d. Size of rate collar (If c. < 60% or c. > 140%, 2 x b. If c. is 70%-130%, b. Otherwise, a graded rate between b. and 2 x b.)	3.00%
5. Advisory July 1, 2019 minimum employer contribution rate (3. – 4.d. but not < 0%)	8.41%
6. Advisory July 1, 2019 maximum employer contribution rate (3. + 4.d.)	14.41%
7. Advisory July 1, 2019 total pension rate, before adjustment	28.84%
8. Net adjustment due to rate collar (5. – 7., but not < 0, or 6. – 7., but not > 0)	(14.43%)
9. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, before collar	14.25%
10. Advisory July 1, 2019 Tier 1/Tier 2 UAL rate, after collar (8. + 9.)	(0.18%)
11. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after collar	14.41%
12. Tier 1/Tier 2 retiree healthcare rate	0.49%
13. Net adjustment due to 6% minimum (6% - 11. - 12., minimum 0%)	0.00%
14. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, before minimum adjustment	14.45%
15. Advisory July 1, 2019 Tier 1/Tier 2 pension normal cost rate, after minimum adjustment (13. + 14.)	14.45%
16. Advisory July 1, 2019 Tier 1/Tier 2 pension rate, after minimum adjustment (11. + 13.)	14.41%

Tier 1/Tier 2 Valuation Results

Contribution Rate Development

Tier 1/Tier 2 Employer Contribution Rate Summary (Post-Rate Collar)

The table below summarizes the employer's pension contribution rate for Tier 1 /Tier 2 after adjustments for the rate collar and the 6 percent of payroll minimum employer contribution rate.

	Advisory July 1, 2019 Rates calculated as of December 31, 2016	July 1, 2017 Rates calculated as of December 31, 2015
1. Tier 1/Tier 2 pension contribution rates		
a. Employer Tier 1/Tier 2 pension normal cost rate	14.45%	13.84%
b. Tier 1/Tier 2 UAL rate	(0.18%)	(2.58%)
c. Multnomah Fire District #10 rate	0.14%	0.15%
d. Total Tier 1/Tier 2 pension rate <i>(a. + b. + c., minimum of 5.51%)</i>	14.41%	11.41%

Data

Demographic Information

Employer Valuation Payroll

	General Service	Police & Fire	Total
Tier 1	\$494	\$0	\$494
Tier 2	42,957	0	42,957
Tier 1/Tier 2 valuation payroll	43,451	0	43,451
OPSRP valuation payroll	41,900	0	41,900
Combined valuation payroll	\$85,351	\$0	\$85,351

Employer Member Census

	December 31							
	2016				2015			
	Tier 1	Tier 2	OPSRP	Total	Tier 1	Tier 2	OPSRP	Total
Active Members ¹								
General Service	0	1	1	2	0	1	1	2
Police & Fire	0	0	0	0	0	0	0	0
Total	0	1	1	2	0	1	1	2
Active Members with previous service segments with the employer								
General Service	1	0	N/A	1	0	0	N/A	0
Police & Fire	0	0	N/A	0	0	0	N/A	0
Total	1	0	N/A	1	0	0	N/A	0
Dormant Members								
General Service	0	0	1	1	0	0	0	0
Police & Fire	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	0	0	0
Retired Members and Beneficiaries								
General Service	5	0	0	5	5	0	0	5
Police & Fire	0	0	0	0	0	0	0	0
Total	5	0	0	5	5	0	0	5
Grand Total Number of Members	6	1	2	9	5	1	1	7

¹ Active counts do not include concurrent employees who have a separate dominant employer.

Data

Demographic Information (continued)

Employer Tier 1/Tier 2 Active Members as of December 31, 2016

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
<20										
20-24										
25-29										
30-34										
35-39										
40-44										
45-49										
50-54										
55-59			1							1
60-64										
65-69										
70-74										
75+										
Total	0	0	1	0	0	0	0	0	0	1

Distribution of Employer Tier 1/Tier 2 Members as of December 31, 2016

Dormant Members			Retired Members and Beneficiaries		
Age	Count	Average Deferred Monthly Benefit	Age	Count	Average Monthly Benefit
<20			<45		
20-24			45-49		
25-29			50-54		
30-34			55-59		
35-39			60-64	1	542
40-44			65-69	2	642
45-49			70-74		
50-54			75-79	1	1,213
55-59			80-84	1	488
60-64			85-89		
65-69			90-94		
70-74			95-99		
75+			100+		
Total			Total	5	705

Brief Summary of Actuarial Methods and Assumptions

A detailed summary of the actuarial methods and assumptions used to prepare the December 31, 2016 valuation can be found in the system-wide actuarial valuation report.

Actuarial Methods and Valuation Procedures

A brief summary of the methods used in this valuation is shown below:

<i>Actuarial cost method</i>	Entry Age Normal.
<i>Amortization Method</i>	<p>The UAL is amortized as a level percentage of combined payroll.</p> <p>The OPSRP UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 16 year period.</p> <p>The Retiree Healthcare UAL as of December 31, 2007 and experience in each subsequent biennium is amortized over a closed 10 year period.</p> <p>All existing Tier 1/Tier 2 UAL was re-amortized over a 20 year period as of the December 31, 2013 rate-setting valuation. Gains and losses between subsequent odd-year valuations will be amortized as a level percentage of projected combined valuation payroll over a closed 20 year period.</p>
<i>Asset valuation method</i>	Market value of assets, excluding reserves.
<i>Contribution rate stabilization method (rate collar)</i>	<p>Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) or independent employer are confined to a collar based on the rate pool's prior pension contribution rate (excluding side account rate offsets). The new contribution rate generally will not increase or decrease from the prior contribution rate by more than the greater of 3 percent of payroll or 20 percent of the current rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funding percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.</p>

Economic Assumptions

A brief summary of the key economic assumptions used in this valuation is shown below:

<i>Net investment return</i>	7.20% compounded annually on system assets.
<i>Interest crediting</i>	<p>7.20% compounded annually on members' regular account balances.</p> <p>7.20% compounded annually on members' variable account balances.</p>
<i>Consumer price inflation</i>	2.50% per year.
<i>Future general wage inflation</i>	3.50% per year.
<i>Healthcare cost inflation</i>	Ranging from 7.5% in 2017 to 4.2% in 2093.
<i>Administrative Expenses</i>	<p>\$6.5 million added to OPSRP normal cost.</p> <p>\$37.5 million added to Tier 1/Tier 2 normal cost.</p>

Brief Summary of Actuarial Methods and Assumptions

Changes Since Last Valuation

The key changes since the December 31, 2015 actuarial valuation are described briefly below and are described in additional detail in the system-wide report.

Changes in Actuarial Methods and Valuation Procedures

- **Allocation of Liability for Service Segments**

For allocating Tier 1/Tier 2 liability among multiple employers, the weighting between Money Match and Full Formula methodologies was updated to reflect expected future experience.

Changes in Economic Assumptions

- **Investment Return and Interest Crediting**

The assumed investment return and interest crediting to both regular and variable account balances was reduced to 7.20%. Previously, the assumed investment return and interest crediting to both regular and variable account balances was 7.50%.

- **Administrative Expenses**

Administrative expenses were assumed to be \$6.5 million per year for the OPSRP System and \$37.5 million per year for the Tier 1/Tier 2 System.

Changes in Demographic Assumptions

- **Mortality**

Mortality assumption uses RP-2014 base tables and mortality improvement scale based on 60-year unisex average Social Security experience.

- **Disability, Retirement, and Termination**

Rates for the disability, retirement, and termination assumptions were adjusted.

A complete summary of all assumptions used as part of the December 31, 2016 actuarial valuation is contained in the system-wide report.

Brief Summary of Changes in Plan Provisions

There were no changes in plan provisions occurred since the December 31, 2015 actuarial valuation. A complete summary of the Tier 1/Tier 2, OPSRP, RHIA, and RHIPA plan provisions valued is provided as part of the system-wide actuarial valuation report.

Glossary

Actuarial Accrued Liability

The portion of the present value of prospective benefits allocated to service and compensation before the valuation date in accordance with the actuarial cost method.

Actuarial Asset Value

The value of assets used in calculating the required contributions. The actuarial asset value may be equal to the fair market value of assets, or it may spread the recognition of certain investment gains or losses over a period of years in accordance with an asset valuation method.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; rates of investment earnings and other relevant items.

Actuarial Cost Method

Sometimes called “funding method,” a particular technique used by actuaries to establish the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily, the annual contribution to the plan comprises the normal cost and an amount for amortization of the unfunded actuarial accrued liability.

Actuarial Gain or (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

Combined Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for both Tier 1/Tier 2 and OPSRP active members. This payroll is used to calculate UAL rates.

Cost Sharing Multiple-Employer Plan

A single plan used to provide pensions to the employees of more than one employer wherein pension obligations are pooled and plan assets can be used to pay the benefits of the employees of any employer that provides pension through the plan.

Employer Contribution Rate

Consists of the normal cost rate and the UAL rates, plus adjustments for other items such as side account rate offsets.

Funded Status

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Normal Cost

The annual cost allocated to the current year, under the actuarial cost method in use. The normal cost divided by the applicable payroll is the normal cost rate.

OPSRP Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for OPSRP active members. This payroll is used to calculate OPSRP normal cost rates.

Glossary

Pre-SLGRP Liability

The sum of Pre-SLGRP Pooled Liabilities and Transition Liabilities.

Pre-SLGRP Pooled Liability

The difference between the total UAL and the UAL attributable to the SLGRP for a pool of employers that joined the SLGRP. There are currently two pre-SLGRP pools. One was created for State Agencies and Community Colleges when the SLGRP was formed. The other one was created when the Local Government Rate Pool joined the SLGRP.

Present Value

Sometimes called “actuarial present value,” the estimated cost (as of the valuation date) of a series of future payments. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Rate Collar

A methodology that defines the maximum permissible period-to-period change in the base employer contribution rate. The width of the rate collar is determined by the current contribution rate and funded status.

Required Supplementary Information (RSI)

Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Statement No. 27 of the Governmental Accounting Standards Board (GASB 27)

The accounting standard governing a state or local governmental employer’s accounting for pensions prior to GASB 68.

Statement No. 45 of the Governmental Accounting Standards Board (GASB 45)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions.

Statement No. 68 of the Governmental Accounting Standards Board (GASB 68)

The accounting standard governing a state or local governmental employer’s accounting for pensions for fiscal years beginning after June 15, 2014.

Statement No. 75 of the Governmental Accounting Standards Board (GASB 75)

The accounting standard governing a state or local governmental employer’s accounting for post-employment benefits other than pensions for fiscal years beginning after June 15, 2017.

Tier 1/Tier 2 Valuation Payroll

Projected payroll subject to PERS employer contribution rates for the calendar year following the valuation date for Tier 1 and Tier 2 active members. This payroll is used to calculate the Tier 1/Tier 2 normal cost rate.

Transition Liability

The difference between the total UAL and the UAL attributable to the SLGRP for an individual employer that joined the SLGRP or the Local Government Rate Pool.

Unfunded Accrued Liability (UAL)

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The UAL is divided by combined valuation payroll and an amortization factor to determine an initial pre-collar UAL rate. The final UAL rate can be adjusted by the rate collar.



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