Milliman

Seattle City Employees' Retirement System

January 1, 2016 Actuarial Valuation

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June 17, 2016

Retirement Board
Seattle City Employees' Retirement System
720 Third Avenue, Suite 900
Seattle, WA 98104

Dear Members of the Board:

As requested, we have prepared an actuarial valuation of the Seattle City Employees' Retirement System (SCERS) as of January 1, 2016. This report reflects the benefit provisions and contribution rates in effect as of January 1, 2016.

Actuarial Certification

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by SCERS staff. This information includes, but is not limited to, statutory provisions, employee 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. It should be noted that the valuation was based on the DRAFT audited financial statements, as the final audited statements were not yet available. 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. Further, in our opinion, each actuarial assumption used is reasonably related to the experience of the Plan and to reasonable expectations which, in combination, represent our best estimate of anticipated experience under the System.

This 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 the 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. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan 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 plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The Retirement Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix A at the May 8, 2014 meeting.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for SCERS. Actuarial computations presented for financial reporting in a separate report under GASB Statements No. 67 and 68 are for purposes of assisting SCERS and participating employers in fulfilling their financial accounting 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 SCERS' funding requirements and goals. 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.

Milliman's work is prepared solely for the internal business use of SCERS. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to 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 its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exception(s):

a) SCERS may provide a copy of Milliman's work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the System.

b) SCERS may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

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

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

The signing actuaries are independent of the City of Seattle. 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, along with the information contained in the Comprehensive Annual Financial 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.

We would like to express appreciation to the system staff, including Mr. Jeff Davis, who gave substantial assistance in supplying the data on which this report is based.

Respectfully submitted,

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Section 1 Summary of the Findings

	January 1, 2016	January 1, 2015
Total Actuarial Contribution Rate	25.32%	25.26%
Funding Ratio	66.5%	66.0%

Overview

We are pleased to present the results of the January 1, 2016 actuarial valuation. This valuation determines the minimum actuarially required employer contribution rate payable beginning January 1, 2017 based on the Board's funding policy. Several key points of the valuation are summarized as follows:

- **Investment Returns:** For the year ending December 31, 2015, the SCERS assets returned around 0.1% on a market basis (net of investment expenses), a rate of return less than the assumed rate. From January 1, 2015 to December 31, 2015, the SCERS assets were assumed to earn 7.50%. The result is an actuarial loss on assets for the 2015 year. Note that only one-fifth of this loss will be recognized in the current year Actuarial Value of Assets (AVA), due to the asset smoothing method; see Section 3 of this report for details. Currently, a net asset loss is being deferred in the AVA; this implies that, if all actuarial assumptions are met in future years, the minimum actuarially required contribution rate is expected to increase in future years.

- **City Contribution Rate:** The minimum actuarially required contribution rate has increased from the prior valuation, from 25.26% to 25.32% of payroll. Since the employees contribute a fixed 10.03% of pay, the minimum actuarially required employer contribution rate has increased from 15.23% of pay to 15.29%.

  The most significant factor causing this increase was the recognition of asset losses from prior years. See the section below titled "Analysis of Change" for more details.

- **Funding Progress:** On the basis of the January 1, 2015 actuarial valuation, the Funding Ratio (which is measured as the AVA divided by the Actuarial Accrued liability) was 66.0%. Based on the January 1, 2016 valuation, the Funding Ratio has increased to 66.5%.The most significant factor causing this increase was the Unfunded Actuarial Accrued Liability (UAAL) amortization payment made by the City during the prior year. Note that these Funding Ratios are calculated using the AVA; Funding Ratio results based on the Market Value of Assets (MVA) are shown in Table 1 at the end of this section.

Overview (continued)

- **Funding Policy:** In August 2013, the Seattle City Council passed a resolution to formally close the period over which any SCERS UAAL will be amortized. This resolution stipulated that the 30-year amortization period would be closed as of the January 1, 2013 actuarial valuation. The result is that, for purposes of the January 1, 2016 valuation calculation, a 27-year remaining closed period is in effect.

The effect of closing the UAAL amortization period is that the total SCERS UAAL is projected to be fully paid off over the next 27 years from the January 1, 2016 valuation date.

Minimum Actuarially Required Contribution Rate

Based on the actuarial valuation of the benefits in effect under the SCERS as of January 1, 2016, the total minimum actuarially required contribution rate increased from 25.26% to 25.32% for the year beginning January 1, 2017.

The current contribution rates for the death benefit program are projected to be sufficient to finance the $2,000 death benefit.

Based on a fixed member contribution rate of 10.03%, this means the City's contribution rate may be increased from 15.23% to 15.29% effective January 1, 2017. This reflects the City's commitment to fund at least the minimum actuarially required contribution rate, which is based on a 27-year amortization of the UAAL beginning January 1, 2016. A greater City contribution rate would result in a shorter amortization of the UAAL, if all actuarial assumptions are met.

It should be noted that the recommended 25.32% of pay is calculated based on the AVA; see Section 3 of this report for details. This AVA is currently deferring a net actuarial asset loss of $84.1 million under the asset smoothing method. This means that if no actuarial gains or losses occur in the future, the minimum actuarially required contribution rate would increase over the next several years as the deferred asset losses are phased into the AVA.

Minimum Actuarially Required Contribution Rate (continued)

We have performed a five-year projection of the contribution rates if 7.50% was returned on the Market Value of Assets in each future year (and assuming that no other actuarial gains or losses occur and there are no other changes to assumptions or benefit provisions). This projection shows the expected impact of recognizing the currently deferred asset gains and losses over time. The result is ultimately an increase in the contribution rate over the next several years.

It is likely that the Market Value of Assets will not return an annual average of exactly 7.50% over all future years. To show the potential impact of volatility in asset returns on the contribution rate, we have performed a projection of the contribution rates at the 5th and 95th percentile expected returns (thereby yielding a 90% asset-return-based confidence interval for the specified rates). These projections are shown in the chart below.

Projected Total Actuarial Required Contribution Rate

Contribution Year*	Assuming 7.50% Future Returns	90% Asset Return Confidence Interval
2017	25.32%	25.32% - 25.32%
2018	25.28%	24.56% - 25.99%
2019	25.40%	23.87% - 26.98%
2020	25.78%	23.24% - 28.47%
2021	26.10%	22.36% - 30.14%
2022	26.10%	20.95% - 31.73%

** Contribution year lags valuation year by one year. For example: Contribution Year 2017 is based on the 2016 valuation results, amortized over 27 years beginning in 2016, if the increase takes place in 2017.*

Compounded Average Return for Period

	Percentile	
	95th	*5th*
1-Year Period	*-11.5%*	*26.6%*
2-Year Period	*-6.7%*	*20.1%*
3-Year Period	*-4.5%*	*17.4%*
4-Year Period	*-3.2%*	*15.8%*
5-Year Period	*-2.3%*	*14.7%*

The 90% confidence interval results are based on the 5th and 95th percentile compounded returns for one-, two-, three-, four- and five-year periods. Since actuarial assets are used, deferred gains or losses would continue to decrease or increase the minimum actuarially required contribution rate after these dates.

See Section 8 of this report for a detailed discussion of the projected contribution rates.

Funding Valuation

This report provides information relevant to the funding of SCERS. Information for financial reporting purposes will be provided in a separate GASB 67 and 68 Disclosure report.

Funding Progress

On the basis of the January 1, 2015 actuarial valuation, the Funding Ratio was 66.0%. Based on the January 1, 2016 valuation, the Funding Ratio is 66.5%. The increase in the Funding Ratio is due mainly to the UAAL payment made by the City in 2015. See Section 3 of this report for a full discussion.

See the following section titled Analysis of Change for more details.

Analysis of Change

The following chart shows the sources of change in the actuarial contribution rate and the funding ratio between the prior and current actuarial valuations.

Sources of Change	Actuarial Contrib. Rate	Funding Ratio
January 1, 2015 Actuarial Valuation	**25.26 %**	**66.0 %**
Expected Valuation-to-Valuation Change	-	1.0 %
Asset Gain/Loss on Actuarial Value	0.18 %	(0.6)%
Salary/Membership Growth Different Than Expected	(0.08)%	(0.1)%
Changes in Assumptions	-	-
Other	(0.04)%	0.2 %
Total Change	0.06 %	0.5 %
January 1, 2016 Actuarial Valuation	**25.32 %**	**66.5 %**

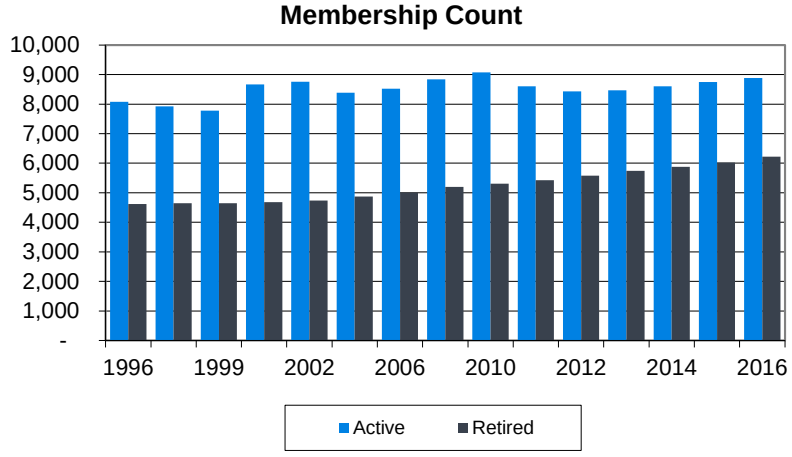
Contingent COLA Benefits

The Seattle Municipal Code allows for an increase in the cost-of-living adjustment (COLA) available to current and future retired members. Currently, the Floor COLA (also referred to as a Restoration of Purchasing Power COLA) is at the 65% level. The enhanced COLA benefit (70% Floor COLA) does not become effective until the System attains at least a 100% funding level.

Since it is unknown when this benefit will become effective, especially given the current funded status of the System, we have not included the valuation of these potential benefit changes (i.e., the increase in the ROPP COLA to the 70% level) in this valuation. See Appendix A of this report for further details.

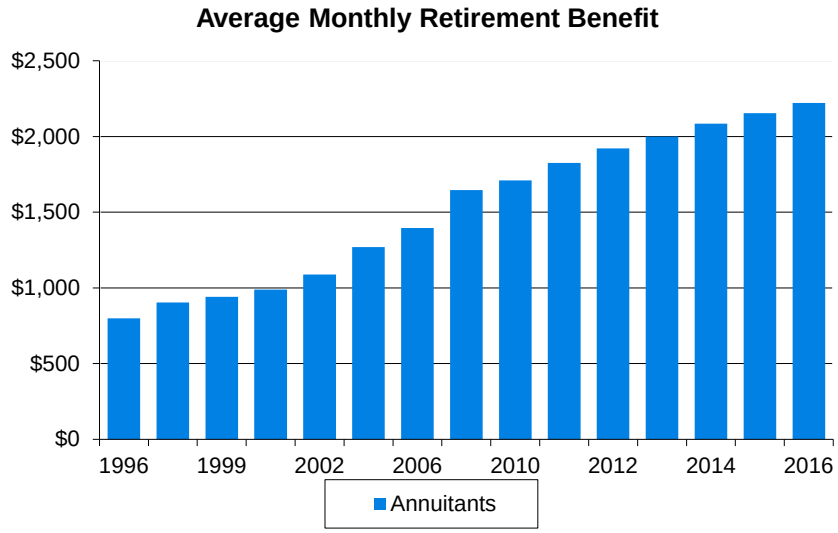
Membership Information

Total valuation payroll has increased by 6.0% since the 2015 valuation, and active membership has increased by 1.6% during this same period. As of January 1, 2016, the annualized payroll is $687 million for 8,882 active members.



Membership Information (continued)

Retired member counts and average retirement benefit amounts continue to increase steadily. As of January 1, 2016, there were 6,223 retired members and beneficiaries with an average benefit of $2,221 per month. This represents a 3.4% increase in count and a 3.1% increase in average benefit amount.



Analysis of Change in Member Population

The following table summarizes the year-to-year change in member population.

	Actives	Deferred Members*	Retirees/ Beneficiaries
January 1, 2015 Valuation	8,746	2,127	6,019
Termination with Refund / Death	(173)	(77)	(220)
Termination without Refund	(211)	211	-
Service Retirement	(324)	(46)	370
Disability Retirement	(3)	-	3
Rehires	40	(40)	-
New Entrants / Beneficiaries	807	22	51
Data Corrections	-	-	-
January 1, 2016 Valuation	8,882	2,197	6,223

** Counts include non-vested terminated members whose contributions are still on deposit with SCERS as of valuation date.*

Summary Exhibit

A summary of the key results of this valuation, along with a comparison to the January 1, 2015 valuation, is shown in Table 1.

Note that the valuation measures are based on the Actuarial Value of Assets, which recognizes asset gains and losses over a five-year period; however, we have also shown key measures using the Market Value of Assets.

Graphs 1 and 2 and the associated data table show historical asset and liability information, including the Present Value of Future Benefits (PVFB) and Present Value of Future Normal Costs (PVFNC), at previous valuation dates.

Seattle City Employees' Retirement System
Actuarial Valuation

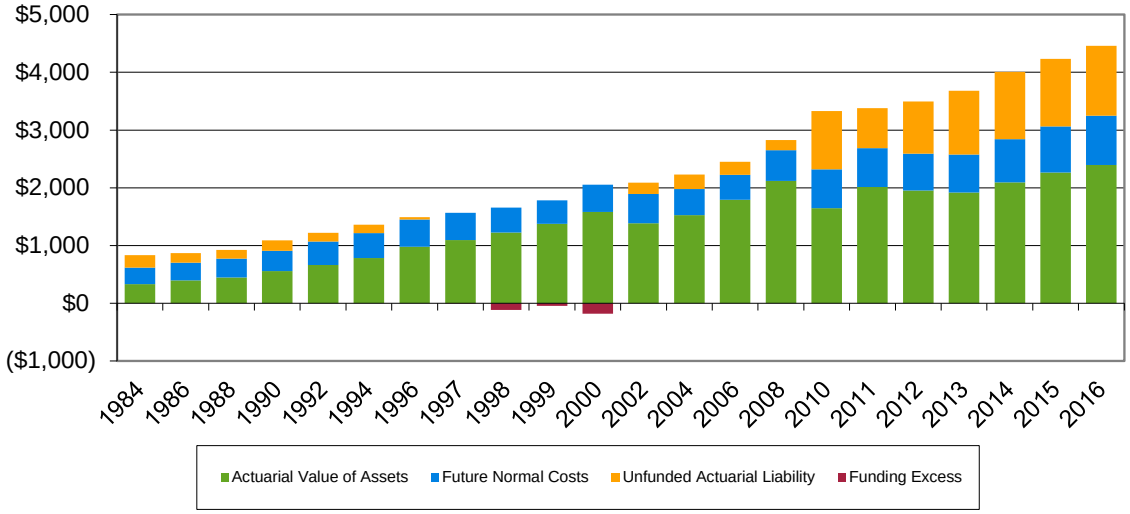
Table 1 Summary of Results

	Valuation January 1, 2016	Valuation January 1, 2015	Percentage Change
I. Total Membership			
A. Active Members	8,882	8,746	1.6%
B. Retired Members & Beneficiaries	6,223	6,019	3.4%
C. Vested Terminated Members*	2,197	2,127	3.3%
D. Total	17,302	16,892	2.4%
II. Pay as of Valuation Date			
A. Annual Total ($millions)	$ 686.7	$ 647.8	6.0%
B. Annual Average	$ 77,317	$ 74,068	4.4%
III. Average Monthly Benefit Paid to Current Retirees and Beneficiaries			
A. Service Retirement	$ 2,356	$ 2,292	2.8%
B. Disability Retirement	1,315	1,274	3.2%
C. Surviving Spouse and Dependents	1,357	1,327	2.2%
D. Total	$ 2,221	$ 2,154	3.1%
IV. Actuarial Accrued Liability ($millions)			
A. Active Members	$ 1,730.0	$ 1,679.1	3.0%
B. Retired Members	1,694.2	1,583.4	7.0%
C. Vested Terminated Members	180.9	170.1	6.4%
D. Total	$ 3,605.1	$ 3,432.6	5.0%
V. Assets			
A. Actuarial Value of Assets ($millions)	$ 2,397.1	$ 2,266.7	5.8%
VI. Unfunded Actuarial Accrued Liability or Surplus Funding ($millions)	$ 1,208.0	$ 1,165.9	3.6%
VII. Amortization of UAAL Total Contribution Rate Needed for 27-Year** Amortization (as a % of Payroll)	25.32%	25.26%	0.2%
VIII. Funding Ratio	66.5%	66.0%	0.7%
IX. Normal Cost as a Percent of Salary	15.80%	15.80%	-
Market Value of Assets (MVA) -- For Informational Purposes Only			
X. Assets Based on MVA A. Market Value of Assets ($millions)	$ 2,313.0	$ 2,322.7	(0.4)%
XI. Amortization of UAAL Based on MVA A. Total Contribution Rate Needed for 27-Year** Amortization (as a % of Payroll)	26.02%	24.57%	5.9%
XII. Funding Ratio Based on MVA	64.2%	67.7%	(5.2)%

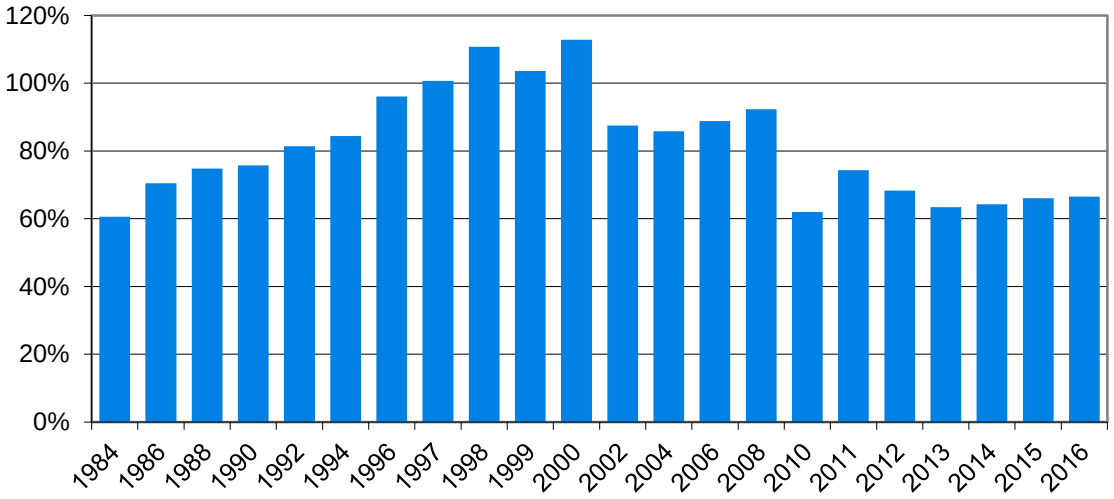
** Includes non-vested terminated members whose contributions are still on deposit with SCERS as of valuation date.*

*** Amortization method is closed 30-year beginning with January 1, 2013 valuation. 2015 values shown are over 28 years.*

Graph 1 Historical Asset and Liability Comparison



Graph 2 Historical Funding Ratios



Year	(in $Millions) PVFB	Assets	PVFNC	UAAL	Funding Ratio
2002	2,088.7	1,383.7	507.3	197.7	87.5%
2004	2,229.8	1,527.5	450.9	251.4	85.9%
2006	2,448.5	1,791.8	431.0	225.8	88.8%
2008	2,825.8	2,119.4	531.2	175.2	92.4%
2010	3,328.7	1,645.3	674.9	1,008.5	62.0%
2011	3,379.6	2,013.7	670.6	695.4	74.3%
2012	3,494.1	1,954.3	634.8	905.0	68.3%
2013	3,679.8	1,920.1	654.5	1,105.2	63.5%
2014	4,007.3	2,094.3	747.2	1,165.8	64.2%
2015	4,231.3	2,266.7	798.7	1,165.9	66.0%
2016	4,458.1	2,397.1	853.0	1,208.0	66.5%

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Section 2 Scope of the Report

This report presents the actuarial valuation of the Seattle City Employees' Retirement System as of January 1, 2016.

A summary of the findings resulting from this valuation is presented in the previous section. Section 3 describes the assets of the System. A summary of the assets is set forth in Table 2. Sections 3, 4, and 5 describe how the obligations of the System are to be met under the actuarial cost method in use.

Section 6 discloses additional historical information.

Section 7 sets forth estimated actuarial gains or losses from the various sources. Section 8 shows projections of the System's funding under both optimistic and pessimistic scenarios. Section 9 shows projections of SCERS benefit payments and dollar contributions over a 10-year period following the actuarial valuation.

Appendix A is a summary of the actuarial procedures and assumptions used to compute the liabilities and contributions shown in this report.

The current benefit structure, as determined by the provisions of the governing law on January 1, 2016, is summarized in Appendix B. Schedules of valuation data classifying the data used in the valuation by various categories of contributing members, former contributing members and beneficiaries make up Appendix C.

Comparative statistics are presented on the System's membership and contribution rates. Appendix D is a glossary of actuarial terms used in this report.

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Section 3 Assets

In many respects, an actuarial valuation can be regarded as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is January 1, 2016. On that date, the assets available for the payment of benefits are appraised. These assets are compared with the actuarial liabilities, which are generally well in excess of the assets. The actuarial process thus leads to a method of determining what contributions by members and their employers are needed to pay expected benefits.

This section of the report deals with the asset determination. In the next section, the actuarial liabilities will be discussed. Section 5 will deal with the process for determining required contributions, based on the relationship between the assets and the actuarial liabilities.

Financial Exhibits

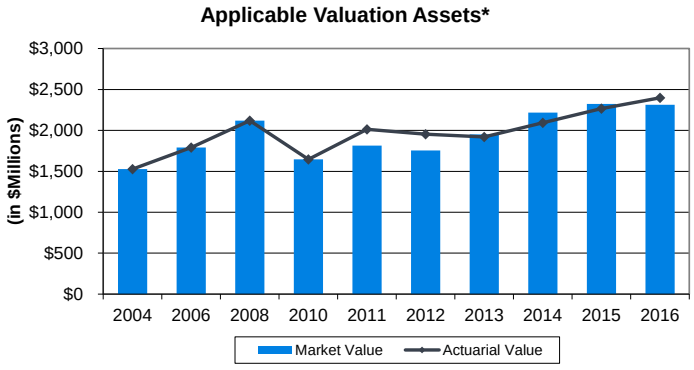
Table 2 shows the calculation of the Actuarial Value of Assets as of January 1, 2016. Note that a net loss is currently being deferred. This means that, if the system earns 7.50% in the future, the AVA will experience an actuarial loss over upcoming years as the remaining portions of deferred losses are recognized. In both the Executive Summary and Section 8 of this report, we discuss projections of the minimum actuarially required contribution rates resulting from this projected actuarial loss on the AVA.

Tables 3 and 4 summarize the financial resources of the System on January 1, 2016 on a Market Value basis. Table 3 shows the Market Value of Assets at January 1, 2016 and January 1, 2015. Table 4 shows the changes in Market Value of Assets during the year ending January 1, 2015 and the year ending January 1, 2016.

Tables 3 and 4 are taken directly from data furnished to us by SCERS staff. We have accepted these tables for use in this report without audit, but we have reviewed them for reasonableness and consistency with previous reports.

Actuarial Asset Method

Beginning with the January 1, 2011 actuarial valuation, SCERS adopted five-year asset smoothing. This smoothing process recognizes the asset gain or loss occurring in each year evenly over a five-year period. The following graph shows a historical comparison of the actuarial and market assets used for valuation purposes. Note that prior to 2011 the AVA was equal to the MVA.



** Prior to 2010, actuarial valuations were only performed every second year.*

Table 2 Calculation of Actuarial Value of Assets at January 1, 2016

(All dollar amounts in millions)

Five-Year Asset Smoothing

Year Ended	Market Value at Beginning of Year	Total Contributions	Benefit Payments Plus Admin. Expenses	Expected Investment Return	Market Value of Assets: Expected*	Market Value of Assets: Actual	Asset Gain/(Loss)	Current Phase Out	Deferred Amount
December 31, 2011	$ 1,812.8	$ 100.7	$ 140.7	$ 139.0	$ 1,911.8	$ 1,753.5	$ (158.3)	0%	-
December 31, 2012	1,753.5	119.6	152.4	134.6	1,855.3	1,951.4	96.1	20%	$ 19.2
December 31, 2013	1,951.4	137.4	161.8	150.3	2,077.3	2,216.9	139.6	40%	55.8
December 31, 2014	2,216.9	154.0	170.7	165.7	2,365.9	2,322.7	(43.2)	60%	(25.9)
December 31, 2015	2,322.7	166.9	183.7	173.6	2,479.5	2,313.0	(166.5)	80%	(133.2)
								Total Deferred at Jan. 1, 2016:	(84.1)
								Market Value of Assets at Jan. 1, 2016:	2,313.0
								Less Total Deferred at Jan. 1, 2016:	(84.1)
								Actuarial Value of Assets at Jan. 1, 2016:	**$ 2,397.1**

** Expected Market Value of Assets based on the actuarial investment return assumption for the prior year, taking into account actual cashflows during year.*

Table 3 Summary of Plan Net Assets (at Market Value)

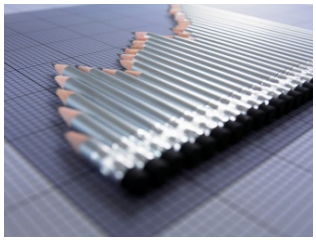
	January 1, 2016		January 1, 2015	
	Market Value	Distribution	Market Value	Distribution
Assets				
Cash and short-term investments	$ 195,572,787	8.5%	$ 115,932,503	5.0%
Securities lending collateral	50,952,037	2.2%	25,231,590	1.1%
Receivables				
Employee	$ 3,496,137	0.2%	$ 2,901,009	0.1%
Employer	4,787,895	0.2%	4,203,851	0.2%
Interest and Dividends	3,449,203	0.1%	4,052,719	0.2%
Sales Proceeds Receivable	6,175,041	0.3%	6,237,050	0.3%
Total Receivables	$ 17,908,276	0.8%	$ 17,394,629	0.7%
Investments at fair value				
Fixed Income*				
US Government obligations	$ 599,493,556	25.9%	$ 175,685,948	7.6%
Corporate bonds		0.0%	181,902,501	7.8%
Mortgage backed		0.0%	118,076,247	5.1%
Foreign sovereign		0.0%	62,846,773	2.7%
Domestic stocks*	1,126,488,036	48.7%	743,020,216	32.0%
International stocks	-	0.0%	590,547,932	25.4%
Real estate	270,796,297	11.7%	243,557,977	10.5%
Alternative	114,895,997	5.0%	106,759,091	4.6%
Total investments	$ 2,111,673,886	91.3%	$ 2,222,396,685	95.7%
Total assets	$ 2,376,106,986	102.7%	$ 2,380,955,407	102.5%
Liabilities				
Pension & Other payables	$ 2,004,636	-0.1%	$ 2,286,308	-0.1%
Securities lending obligation	53,633,431	-2.3%	28,228,622	-1.2%
Investment commitments payable	7,447,756	-0.3%	27,736,782	-1.2%
Total Liabilities	$ 63,085,823	-2.7%	$ 58,251,712	-2.5%
Market Value of Net Assets Held in Trust For Pension Benefits	**$ 2,313,021,163**	**100.0%**	**$ 2,322,703,695**	**100.0%**

** Breakdown not provided for fixed income or equities this year.*

Table 4 Summary of Changes in Plan Net Assets (at Market Value)

	January 1, 2016 Market Value	January 1, 2015 Market Value
Additions		
Contributions		
Employer	$ 101,153,403	$ 89,988,898
Employee	65,779,216	63,969,504
Total contributions	$ 166,932,619	$ 153,958,402
Investment activities		
Investment income (loss)		
Net change in fair value of investments	$ (22,933,464)	$ 93,680,606
Interest	11,377,655	11,584,482
Dividends	27,836,456	25,542,523
Net investment income (loss)	$ 16,280,647	$ 130,807,611
Securities lending activities		
Securities lending income	$ 56,694	$ 23,941
Borrowing rebates	674,010	216,063
Total securities lending income	$ 730,704	$ 240,004
Securities lending management fees	(182,660)	(59,989)
Net income from securities lending	$ 548,044	$ 180,015
Investment activity expenses		
Investment management fees	$ (9,096,421)	$ (7,802,096)
Investment consultant fees	(295,000)	(333,389)
Investment custodial fees	(353,637)	(341,946)
Total investment activity expenses	$ (9,745,058)	$ (8,477,431)
Total additions	$ 174,016,252	$ 276,468,597
Deductions		
Benefits	$ 159,349,807	$ 150,239,008
Refunds of contributions	16,137,840	15,103,615
Administrative expenses	8,211,137	5,330,764
Total deductions	$ 183,698,784	$ 170,673,387
Net Increase/(Decrease)	$ (9,682,532)	$ 105,795,210
Net position held in trust for pension benefits		
Beginning of Year	$ 2,322,703,695	$ 2,216,908,485
End of Year	**$ 2,313,021,163**	**$ 2,322,703,695**

Section 4 Actuarial Liabilities



In the previous section, an actuarial valuation was related to an inventory process and an analysis was given of the inventory of assets of the System as of the valuation date, January 1, 2016. In this section, the discussion will focus on the commitments of the System, which will be referred to as its actuarial liabilities (or, actuarial value of future benefits).

Actuarial Present Value of Future Benefits

In an active system, the present value of future actuarial liabilities will almost always exceed the actuarial assets. This is usually expected in all but a fully closed down fund, where no further contributions of any sort are anticipated. This deficiency has to be provided for by future contributions. The funding method for the system sets out a schedule of future contributions that will deal with any deficiency in an orderly fashion. The determination of the level of future contributions needed is discussed in the next section (Section 5) of this report.

Table 5 contains an analysis of the actuarial present value of all future benefits for contributing members, former contributing members, and beneficiaries. The analysis is given by type of benefit.

The actuarial liabilities summarized in Table 5 include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes a measure of both benefits already earned and future benefits to be earned. Thus, for all current members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and, if an optional benefit is chosen, for the lives of their surviving beneficiaries.

The actuarial assumptions used to determine the liabilities are based on the results of the 2014 Investigation of Experience Report. New assumptions were adopted by the Board effective with the January 1, 2014 actuarial valuation. See Appendix A of this report for details.

Actuarial Cost Method

The method used to determine how the actuarial cost for an individual (or for the System as a whole) is allocated to past and future years is referred to as the actuarial cost method. For this valuation, the individual entry age normal cost (EANC) method has been used.

Under this method, the actuarial liabilities discussed above are allocated into two primary calculation components:

1. A normal cost
2. An actuarial accrued liability

Normal Cost and Actuarial Accrued Liability

The normal cost under the EANC method is developed so that benefits are allocated as a level percentage of payroll for each member, from the member's membership date to the member's termination date. One key feature of the EANC method is that normal costs tend to be stable from year to year (assuming no change in assumptions or benefit provisions) because most members' entry age cost percentages do not change materially from year to year, and because the population typically does not change considerably from year to year. The normal cost rates as a percentage of payroll for the current and prior valuation are shown by benefit type in Table 6. These normal cost contribution rates are intended to be contributed in each year in order to fund the ongoing cost of benefit accruals.

The annual normal cost rate may be considered the ongoing cost of benefit accruals for any given plan year. When the present value of all future normal costs is subtracted from the present value of total benefits, the result is the actuarial accrued liability (AAL). This can be thought of as the current value of all past normal costs, or the amount that would be in the fund if all prior actuarial assumptions had been exactly met. The AAL represents the portion of the present value of total benefits that the cost method allocates to past service.

To the extent that this AAL exceeds plan assets, an Unfunded Actuarial Accrued Liability (UAAL) exists. Table 7 calculates the UAAL, if any, for the current and prior valuations. Note that currently, a UAAL exists for SCERS; the payoff of this UAAL is discussed in more detail in Section 5 (City Contributions) of this report.

Table 5 Actuarial Present Value of Future Benefits (PVFB)

(All dollar amounts in millions)

		January 1, 2016	January 1, 2015
A.	Active Members		
	Service Retirement	$ 2,444.9	$ 2,347.7
	Vested Retirement	65.6	62.1
	Disability Retirement	7.3	7.0
	Survivor Benefits	22.7	22.1
	Refund of Member Contributions	42.5	38.9
	Total	$ 2,583.0	$ 2,477.8
B.	Inactive Members and Annuitants		
	Service Retirement	$ 1,585.3	$ 1,476.1
	Disability Retirement	10.5	10.1
	Beneficiaries	98.4	97.2
	Inactive Members	180.9	170.1
	Total	$ 1,875.1	$ 1,753.5
C.	**Grand Total PVFB**	**$ 4,458.1**	**$ 4,231.3**

Table 6 Normal Cost Contribution Rates as Percentages of Salary

	January 1, 2016	January 1, 2015
Service Retirement	12.55 %	12.52 %
Vested Retirement	1.22	1.24
Disability Retirement	0.07	0.07
Survivor Benefits	0.17	0.17
Refund of Member Contributions	1.19	1.20
Administrative Expenses	0.60	0.60
Total	**15.80 %**	**15.80** %

Table 7 Unfunded Actuarial Accrued Liability (UAAL)

(All dollar amounts in millions)

		January 1, 2016	January 1, 2015
A.	Actuarial present value of all future benefits for present and former members and their survivors (Table 3)	$ 4,458.1	$ 4,231.3
B.	Less actuarial present value of total future normal costs for present members	853.0	798.7
C.	Actuarial accrued liability* [A - B]	$ 3,605.1	$ 3,432.6
D.	Less actuarial value of assets available for benefits (Table 2)	2,397.1	2,266.7
E.	Unfunded actuarial accrued liability (Funding Excess, if negative) [C - D]	$ 1,208.0	$ 1,165.9
F.	Funding Ratio [D ÷ C]	66.5%	66.0%

** The actuarial accrued liability as of January 1, 2017 is projected to be $3,792.6 million.*

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Section 5 City Contributions

As shown in Table 7 in the previous section of this report, the AAL exceeds the current Actuarial Value of Assets. In other words, as of the January 1, 2016 valuation, a UAAL exists for SCERS.

Because a UAAL exists, the total calculated minimum actuarially required contribution rate will consist of two components:

1. The normal cost contribution rate as of January 1, 2016
2. An amortization payment intended to pay off the UAAL in accordance with the SCERS funding policy

Funding

The current SCERS funding policy was updated by a Seattle City Council resolution in August 2013. The funding policy specifies that the UAAL will be amortized as a level percentage of payroll over a closed 30-year period as of the January 1, 2013 actuarial valuation. This means that, for the January 1, 2016 valuation, the amortization contribution rate must pay off the current UAAL over a 27-year period.

Actuarial Gains and Losses

When experience is different from actuarial expectation, an actuarial gain or loss occurs. Ongoing actuarial gains and losses decrease and increase the UAAL. Section 7 of this report illustrates the historical actuarial gains and losses on the UAAL by source.

Amortization of UAAL

Table 8 details the components of the minimum actuarially required contribution rate of 25.32% by breaking it into the necessary funding components: normal cost and amortization of UAAL. It then illustrates the split between member and employer contribution rates, assuming that member contributions are allocated entirely toward paying the ongoing normal cost of benefits.

As of the January 1, 2016 valuation, the minimum actuarially required contribution rate for the employer has increased to 15.29% beginning January 1, 2017. This is mainly due to the recognition of deferred asset losses from prior years.

The total contribution rate of 25.26% being paid in 2016 was calculated in order to amortize the January 1, 2015 UAAL over a 28-year period; however, this rate is not projected to perfectly amortize the January 1, 2016 UAAL over 27 years due to gains and losses that have occurred during the year. Table 9 details the expected amortization of the UAAL over the 27-year closed period beginning January 1, 2016.

Amortization of UAAL (continued)

The total contribution rate can be immediately (i.e., as of the beginning of the next calendar year) increased from 25.26% of pay to 25.32% of pay to be projected to amortize the UAAL over the scheduled 27 years from January 1, 2016. If the contribution rate is not increased, the UAAL would be projected to be amortized over a longer period than 27 years. Because this figure is based on an Actuarial Value of Assets that is currently deferring a net loss, this 25.32% is projected to increase over the next several years if no other actuarial asset gains or losses were to occur.

In Section 8 of this report, we have included a five-year projection of the actuarial required contribution, including optimistic and pessimistic investment return scenarios.

Table 8 Contribution Rates as Percentages of Salary

		Actuarial Required Contribution Beginning	
		January 1, 2016	January 1, 2015
A.	Total normal cost rate	15.80 %	15.80 %
B.	UAAL amortization rate	9.52	9.46
C.	Actuarial required contribution rate	25.32 %	25.26 %
D.	Member contribution rate	10.03	10.03
E.	Allocation of employer contribution rate*		
	Normal cost	5.77 %	5.77 %
	Amortization payment	9.52	9.46
	Total employer contribution rate	15.29 %	15.23 %

** If member contributions are all allocated to paying normal cost.*

Table 9 Amortization of Unfunded Actuarial Accrued Liability (UAAL)*

(All dollar amounts in millions)

Year	Payroll	Total Contribution Rate	Normal Cost Rate	UAAL Rate	UAAL Beginning Balance	UAAL Amortization Payment	UAAL Interest	UAAL Ending Balance
2016	$ 687	25.26%	15.80%	9.46%	$ 1,208.0	$ 65.0	$ 88.2	$ 1,231.2
2017	718	25.32%	15.80%	9.52%	1,231.2	68.3	89.8	1,252.7
2018	750	25.32%	15.80%	9.52%	1,252.7	71.4	91.3	1,272.7
2019	784	25.32%	15.80%	9.52%	1,272.7	74.6	92.7	1,290.8
2020	819	25.32%	15.80%	9.52%	1,290.8	77.9	93.9	1,306.8
2021	856	25.32%	15.80%	9.52%	1,306.8	81.5	95.0	1,320.3
2022	895	25.32%	15.80%	9.52%	1,320.3	85.2	95.9	1,331.0
2023	935	25.32%	15.80%	9.52%	1,331.0	89.0	96.5	1,338.6
2024	977	25.32%	15.80%	9.52%	1,338.6	93.0	97.0	1,342.5
2025	1021	25.32%	15.80%	9.52%	1,342.5	97.2	97.1	1,342.5
2026	1067	25.32%	15.80%	9.52%	1,342.5	101.6	96.9	1,337.9
2027	1115	25.32%	15.80%	9.52%	1,337.9	106.1	96.4	1,328.2
2028	1165	25.32%	15.80%	9.52%	1,328.2	110.9	95.5	1,312.8
2029	1218	25.32%	15.80%	9.52%	1,312.8	115.9	94.2	1,291.1
2030	1273	25.32%	15.80%	9.52%	1,291.1	121.2	92.4	1,262.3
2031	1331	25.32%	15.80%	9.52%	1,262.3	126.7	90.0	1,225.7
2032	1391	25.32%	15.80%	9.52%	1,225.7	132.4	87.0	1,180.3
2033	1454	25.32%	15.80%	9.52%	1,180.3	138.4	83.4	1,125.4
2034	1520	25.32%	15.80%	9.52%	1,125.4	144.7	79.1	1,059.8
2035	1589	25.32%	15.80%	9.52%	1,059.8	151.2	73.9	982.5
2036	1661	25.32%	15.80%	9.52%	982.5	158.1	67.9	892.2
2037	1736	25.32%	15.80%	9.52%	892.2	165.2	60.8	787.8
2038	1814	25.32%	15.80%	9.52%	787.8	172.6	52.7	667.9
2039	1896	25.32%	15.80%	9.52%	667.9	180.5	43.4	530.9
2040	1982	25.32%	15.80%	9.52%	530.9	188.6	32.9	375.2
2041	2072	25.32%	15.80%	9.52%	375.2	197.2	20.9	198.8
2042	2166	25.32%	15.80%	9.52%	198.8	206.1	7.3	(0.0)

** Amortization shown does not include the projected impact of currently deferred asset gains and losses.*

Section 6 Additional Actuarial Information

The schedule of funding progress is shown in Table 10 and compares assets and liabilities over the years. Primarily due to the poor investment returns of 2000 through 2003, as well as the extreme market downturn of 2008, the plan is not fully funded. Another material factor in the current funding shortfall is the benefit enhancements triggered in 2007 (i.e., 65% Floor COLA and the 1.5% COLA for all retirees).

Exhibit 11 compares the Actuarial Value of Valuation Assets to the types of Actuarial Accrued Liabilities, applying them first to Active Member contributions, then to retirees and beneficiaries, and then the remaining amount to the Active Members benefits. This is referred to as the Solvency Test. Although not required under GASB, this test is part of the CAFR guidelines specified by the Government Finance Officers Association (GFOA).

Table 10 Schedule of Funding Progress

(All dollar amounts in millions)

Actuarial Valuation Date January 1	Actuarial Value of Assets	Actuarial Accrued Liabilities (AAL)	Unfunded Actuarial Accrued Liabilities (UAAL)	Funded Ratio	Covered Payroll*	UAAL as a Percentage of Covered Payroll
1986	$ 395.7	$ 561.3	$ 165.6	70.5%	$ 182.0	91.0%
1988	445.4	595.3	149.9	74.8	199.0	75.3
1990	558.8	737.9	179.1	75.7	212.3	84.4
1992	660.0	810.5	150.5	81.4	239.4	62.9
1994	781.8	926.2	144.4	84.4	291.8	49.5
1996	980.2	1,019.7	39.5	96.1	310.6	12.7
1997	1,094.8	1,087.3	(7.5)	100.7	316.9	(2.4)
1998 **	1,224.6	1,266.7	42.1	96.7	341.5	12.3
1999	1,375.0	1,326.6	(48.4)	103.6	370.4	(13.1)
2000	1,582.7	1,403.1	(179.6)	112.8	383.6	(46.5)
2002	1,383.7	1,581.4	197.7	87.5	405.1	48.8
2004	1,527.5	1,778.9	251.4	85.9	424.7	59.2
2006	1,791.8	2,017.5	225.8	88.8	447.0	50.5
2008	2,119.4	2,294.6	175.2	92.4	501.9	34.9
2010	1,645.3	2,653.8	1,008.5	62.0	580.9	173.6
2011	2,013.7	2,709.0	695.4	74.3	563.2	123.5
2012	1,954.3	2,859.3	905.0	68.3	557.0	162.5
2013	1,920.1	3,025.3	1,105.2	63.5	567.8	194.6
2014	2,094.3	3,260.1	1,165.8	64.2	597.9	195.0
2015	2,266.7	3,432.6	1,165.9	66.0	630.9	184.8
2016	2,397.1	3,605.1	1,208.0	66.5	641.7	188.3

** Covered Payroll includes compensation paid to all active employees on which contributions are calculated. Covered Payroll differs from the Active Member Valuation Payroll shown in Table 1, which is an annualized compensation of only those members who were active on the actuarial valuation date.*

*** Reflects increased COLA benefits adopted by the City Council after the valuation was completed.*

Table 11 Solvency Test

(All dollar amounts in millions)

Actuarial Valuation Date January 1	Actuarial Value of Valuation Assets	Actuarial Accrued Liabilities for (A) Active Member Contributions	(B) Inactives, Retirees and Beneficiaries	(C) Active Members (Employer Financed Portion)	(D) Total	Portion of Actuarial Accrued Liabilities Covered by Assets (A)	(B)	(C)	(D)
1986	$ 395.7	$ 110.7	$ 263.1	$ 187.5	$ 561.3	100.0%	100.0%	11.7%	70.5%
1988	445.4	136.0	303.6	155.7	595.3	100.0	100.0	3.7	74.8
1990	558.8	164.0	332.8	241.1	737.9	100.0	100.0	25.7	75.7
1992	660.0	202.6	357.9	250.0	810.5	100.0	100.0	39.8	81.4
1994	781.8	248.4	383.1	294.7	926.2	100.0	100.0	51.0	84.4
1996	980.2	294.1	409.3	316.3	1,019.7	100.0	100.0	87.5	96.1
1997	1,094.8	313.1	449.8	324.4	1,087.3	100.0	100.0	100.0	100.7
1998 *	1,224.6	337.3	551.8	377.6	1,266.7	100.0	100.0	88.9	96.7
1999	1,375.0	358.4	577.6	390.6	1,326.6	100.0	100.0	100.0	103.6
2000	1,582.7	385.2	599.4	418.5	1,403.1	100.0	100.0	100.0	112.8
2002	1,383.7	434.3	675.6	471.5	1,581.4	100.0	100.0	58.1	87.5
2004	1,527.5	482.5	758.9	537.5	1,778.9	100.0	100.0	53.2	85.9
2006	1,791.8	539.7	902.2	575.6	2,017.5	100.0	100.0	60.8	88.8
2008	2,119.4	590.1	1,084.9	619.6	2,294.6	100.0	100.0	71.7	92.4
2010	1,645.3	684.7	1,176.4	792.7	2,653.8	100.0	81.7	0.0	62.0
2011	2,013.7	683.7	1,290.9	734.4	2,709.0	100.0	100.0	5.3	74.3
2012	1,954.3	730.9	1,393.7	734.7	2,859.3	100.0	87.8	0.0	68.3
2013	1,920.1	757.3	1,513.4	754.6	3,025.3	100.0	76.8	0.0	63.5
2014	2,094.3	792.4	1,657.0	810.7	3,260.1	100.0	78.6	0.0	64.2
2015	2,266.7	829.7	1,753.5	849.4	3,432.6	100.0	82.0	0.0	66.0
2016	2,397.1	851.2	1,875.1	878.8	3,605.1	100.0	82.4	0.0	66.5

** Reflects increased COLA benefits adopted by the City Council after the valuation was completed.*

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Section 7 Actuarial Gains or Losses

An analysis of actuarial gains or losses was performed in conjunction with the January 1, 2014, January 1, 2015, and January 1, 2016 actuarial valuations.

The results of our analysis of the financial experience of the System in the three most recent actuarial valuations are presented in Table 12. Each gain or loss shown represents our estimate of how much the given type of experience caused the UAAL to change in the period since the previous actuarial valuation.

Gains and losses due to demographic sources are approximate. Demographic experience is analyzed in greater detail in our periodic assumption studies.

Table 12 Analysis of Actuarial Gains or Losses*

(All dollar amounts in millions)

	Gain/(Loss) For Period		
	2015	2014	2013
Investment Income Investment income on AVA was greater (less) than assumed.	$ (22.1)	$ 32.6	$ 50.8
Pay Increases Pay increases were less (greater) than expected.	(7.3)	(3.9)	3.3
Age and Service Retirements Members retired at older (younger) ages or with less (greater) final average pay than expected.	17.2	13.0	11.7
Disability Retirements Disability claims were less (greater) than expected.	(0.1)	(0.1)	(0.1)
Death-in-Service Benefits Survivor claims were less (greater) than expected.	-	-	-
Withdrawal from Employment More (less) reserves were released by withdrawals than expected.	(24.0)	(25.4)	(19.1)
Death after Retirement Retirees died younger (lived longer) than expected.	9.0	5.6	(3.1)
Total Gain or (Loss) during Period from Financial Experience	$ (27.3)	$ 21.7	$ 43.5
Non-Recurring Items:			
Changes in actuarial assumptions and plan amendments caused a gain (loss).	-	-	(76.7)
Data revisions	-	-	-
Change in actuarial asset valuation method caused a gain (loss).	N/A	N/A	N/A
Composite Gain (Loss) During Period	$ (27.3)	$ 21.7	$ (33.2)

** Effects related to losses are shown in parentheses. Numerical results are expressed as a decrease (increase) in the UAAL.*

Section 8 Contribution Rate Projections and Increases

This section of the January 1, 2016 actuarial valuation is devoted to a detailed discussion of the contribution rates currently needed, and projected to be needed, in order to effectively fund the System.

This section illustrates two key points:

1. As mentioned throughout this report, the current AVA is deferring a net loss. As a result, if no actuarial asset gains or losses were to occur over the next several years (i.e., the market return equals 7.50%), the minimum actuarially required contribution rate would be projected to increase slightly (and the Funding Ratio would be projected to decrease) as the remaining deferred losses are fully phased in.
2. Currently, the City is expected to contribute a total rate of 25.32% of payroll (employer and member) beginning January 1, 2017, on the basis of the current valuation report. The actual contribution rate needed will vary in the future. We have shown projections to roughly quantify the potential impact of good and bad experience.

Projection of Minimum Actuarially Required Contribution Rate

We have performed a five-year projection of the minimum actuarially required contribution rate under three different scenarios:

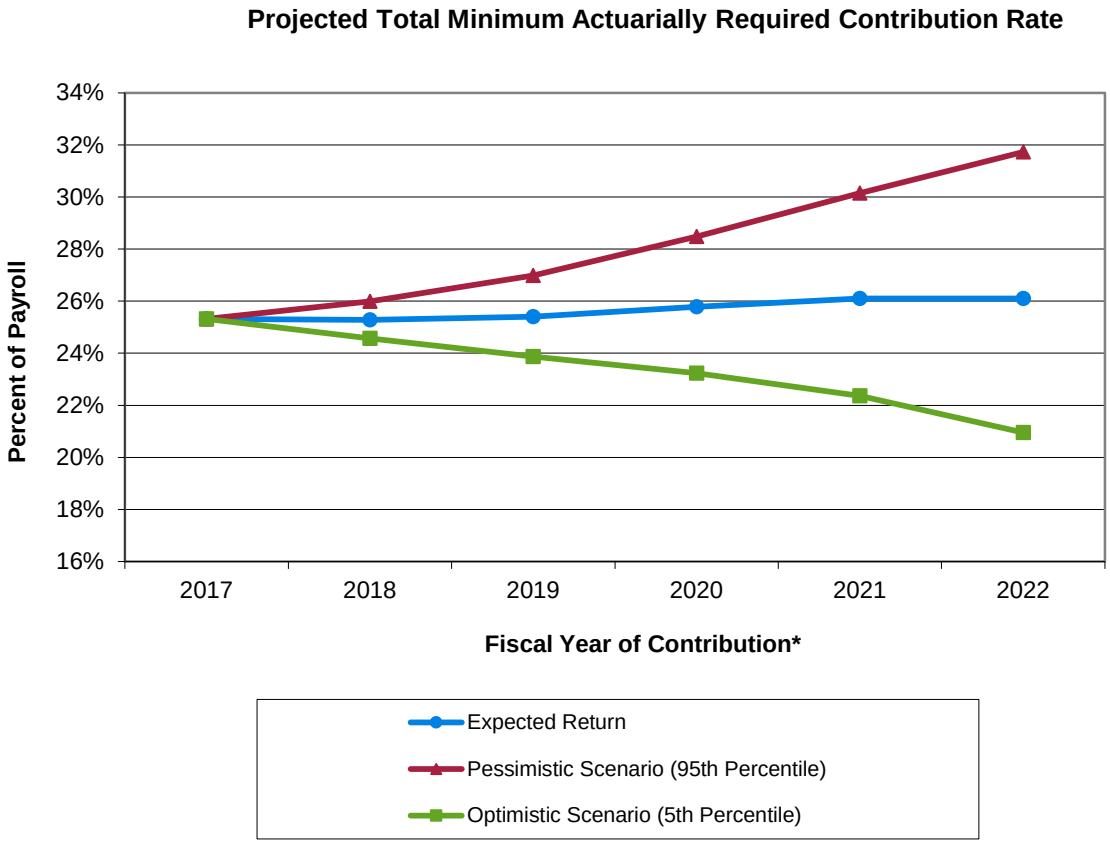
1. Assuming that the investment return assumption of 7.50% is met in each future year.
2. Assuming that the assets return at the 5th percentile.
3. Assuming that the assets return at the 95th percentile.

The result is effectively a 90% confidence interval (based on asset returns) of the projected contribution rates in these years. Note that in each scenario, all other actuarial assumptions are assumed to be met.

The projections assume the City contributes the minimum actuarially required contribution rate each year in the future. This rate is based on a 27-year closed amortization period as of January 1, 2016 and includes a 0.50% population growth assumption. Future returns at the 5th and 95th percentile are based on Milliman's capital market assumptions and SCERS's target asset allocation as of January 1, 2016.

Table 13 provides the results of these projections.

Table 13 Projected Total Contribution Rates



Projected Minimum Actuarially Required Total Contribution Rate			
Contribution Year*	If Asset Return at 95th Percentile	Assuming 7.50% Future Returns	If Asset Return at 5th Percentile
2017	25.32%	25.32%	25.32%
2018	25.99%	25.28%	24.56%
2019	26.98%	25.40%	23.87%
2020	28.47%	25.78%	23.24%
2021	30.14%	26.10%	22.36%
2022	31.73%	26.10%	20.95%

** Contribution year lags calculation year by one year. For example: Contribution Year 2017 is based on the 2016 valuation results, amortized over 27 years beginning in 2016, if the increase takes place in 2017.*

Assumed Returns for Projection

The projection above uses the 5th and 95th percentile returns based on SCERS' target asset allocation and Milliman's January 1, 2016 capital market assumptions. These percentile returns vary by the number of years of return; for example, the Contribution Year 2017 number assumes one year of return at the one-year 5th or 95th percentile rate; the Contribution Year 2018 number assumes two years of return at the two-year 5th or 95th percentile rate.

The percentile rates assumed for this analysis are shown in the table below:

Compounded Average Return for Period		
	Percentile	
	95th	*5th*
1-Year Period	*-11.5%*	*26.6%*
2-Year Period	*-6.7%*	*20.1%*
3-Year Period	*-4.5%*	*17.4%*
4-Year Period	*-3.2%*	*15.8%*
5-Year Period	*-2.3%*	*14.7%*

Contribution Decreases

The current contribution rate would need to be increased in order to be projected to perfectly amortize the UAAL over a 27-year period as of the valuation date. As of January 1, 2017, a minimum actuarially required contribution rate of 25.32% is projected to be needed in order to amortize the UAAL over a 27-year period beginning January 1, 2016.

This represents a increase of 0.06% of pay compared with the current 25.26% of pay being contributed (by the employer and members combined) based on a target of a 100% Funding Ratio by January 1, 2043. Note that due to the future recognition of deferred asset losses, this amount is expected to increase in the next valuation, if all assumptions are met.

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Section 9 Projection of Benefit Payments and Contribution Dollars

Projection of Benefit Payments and Contribution Dollars

This section of the January 1, 2016 actuarial valuation illustrates projected SCERS benefit payments and dollar contributions over a 10-year period following the actuarial valuation.

These projections assume all actuarial assumptions, including 7.50% investment returns (on a market basis) in each future year, are met in the future.

The projection of contribution dollars makes the following three additional key assumptions:

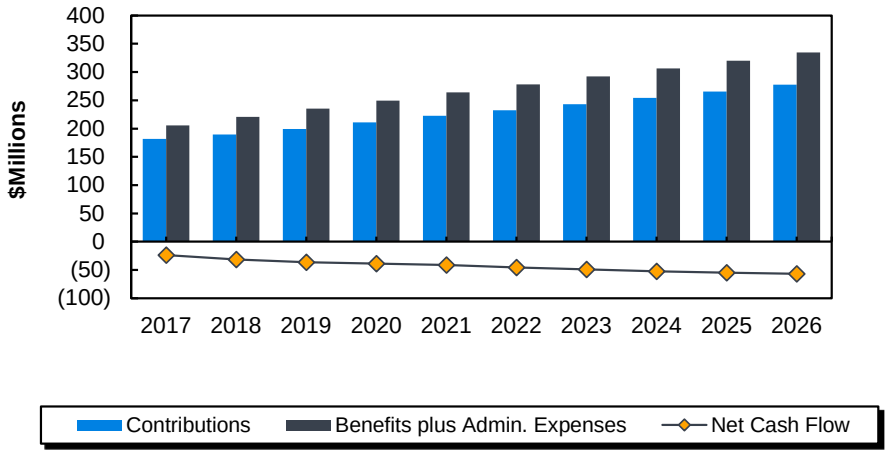
1. Valuation payroll is assumed to grow with both wage inflation of 4.00% and annual population growth of 0.50% (per current SCERS assumptions).
2. The City is assumed to make the minimum actuarially required contribution rate calculated in each projection year.
3. Future recognition of currently deferred asset gains or losses is reflected in the projection.

Table 14 shows the results of these projections.

Table 14 10-Year Projection of Benefit Payments and Contributions*

Year	Projected Payroll	Projected Admin. Expenses	Projected Benefit Payments	Projected Total Cash Outflow	Projected Total Contributions	Projected Net Cash Flow
2017	$ 717.7	$ 4.3	$ 201.3	$ 205.6	$ 181.7	$ (23.9)
2018	750.2	4.5	216.4	220.9	189.6	(31.3)
2019	784.1	4.7	230.5	235.2	199.1	(36.1)
2020	819.5	4.9	244.6	249.5	210.8	(38.7)
2021	856.6	5.1	258.7	263.8	222.5	(41.3)
2022	895.3	5.4	272.9	278.3	232.6	(45.7)
2023	935.8	5.6	286.6	292.2	243.1	(49.1)
2024	978.1	5.9	300.4	306.3	254.1	(52.2)
2025	1,022.3	6.1	314.1	320.2	265.6	(54.7)
2026	1,068.5	6.4	328.0	334.4	277.6	(56.8)

Cash Flow Projections



** Benefit payments do not include administrative expenses. Contributions include employer and member contributions.*

Appendix A Actuarial Procedures and Assumptions

This section of the report describes the actuarial procedures and assumptions used in this valuation. The assumptions used in this valuation were adopted by the SCERS Board at its May 2014 meeting. They are based on Milliman's Investigation of Experience for the period ending December 31, 2013. Further discussion and the rationale for the assumptions are shown in that report.

The actuarial assumptions used in the valuation are intended to estimate the future experience of the members of the System and of the System itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in the estimated costs of the System's benefits. Table A-1 summarizes the actuarial assumptions.

Table A-2 presents expected annual salary increases for various years of service. Tables A-3 through A-6 show rates of decrement for service retirement, disability, mortality, and other terminations of employment. Table A-7 shows probabilities of refund upon termination.

Actuarial Cost Method

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets, and (b) the actuarial present value of future normal costs is called the unfunded actuarial accrued liability or UAAL. The UAAL is amortized as a level percentage of the projected salaries of present and future members of the System.

Records and Data

The data used in the valuation consist of financial information; records of age, sex, service, salary, contribution rates and account balances of contributing members; and records of age, sex, and amount of benefit for retired members and beneficiaries. All of the data were supplied by the System and are accepted for valuation purposes without audit.

Replacement of Terminated Members

The ages at entry and distribution by sex of future members are assumed to average the same as those of the present members they replace. If the number of active members should increase, it is further assumed that the average entry age of the larger group will be the same, from an actuarial standpoint, as that of the present group. Under these assumptions, the normal cost rates for active members will not vary with the termination of present members.

City Contributions

The City contribution rate is determined as of the prior year's valuation such that the combined member and City contribution rate is sufficient to amortize the UAAL over a closed 30-year period beginning January 1, 2013. The amortization payment is based on a level percent of pay.

Administrative Expense

The annual contribution assumed to be necessary to meet general administrative expenses of the system, excluding investment expenses, is 0.60% of members' salaries. This figure is included in the calculation of the normal cost rate.

Valuation of Assets

The assets are valued using a five-year smoothing method based on the difference between the expected market value and the actual market value of the assets in each year. The expected market value is the prior year's market value increased with the net increase in the cash flow, all increased with interest during the past fiscal year at the expected investment return rate assumption.

Investment Earnings

The annual rate of investment earnings of the assets of the System is assumed to be 7.50%. This rate is compounded annually and is net of investment expenses.

Postretirement Benefit Increases

Postretirement benefit increases include:

- Automatic 1.5% Annual COLA – This benefit applies to all members.
- 65% Restoration of Purchasing Power (ROPP) – The member's benefit is the greater of 65% of the annual initial benefit adjusted for CPI or their applicable benefit. This minimum benefit is available to all retirees and beneficiaries. The financial impact of the ROPP benefit is valued assuming an annual price inflation rate of 3.25%.

Additional contingent COLA increases that were adopted in 2001, but not effective until the System reaches at least a 100% funding ratio, are not included in the valuation results.

Valuation Services

The projected salary for the valuation year is equal to the member's hourly pay rate multiplied by 2088 with the following adjustments:

- Increased by 4.04% to reflect a 2% cost-of-living increase for 2016 and a retro 2% increase for 2015.
- Annualized pay for members who entered in year preceding valuation year.
- Multiplied hourly pay rate by minimum of 1,040 and actual hours worked in prior year for part-time employees.

Future Salaries

Table A-2 illustrates the rates of future (after the valuation year) salary increases assumed for the purpose of the valuation. In addition to increases in salary due to promotions and longevity, this scale includes an assumed 4.00% per annum rate of increase in the general wage level of the membership.

Service Retirement

Table A-3 shows the annual assumed rates of retirement among members eligible for service retirement or reduced retirement. Separate rates are also used during the first year a member is eligible for service retirement.

Disability

The rates of disability used in this valuation are illustrated in Table A-4. It is assumed that one-third of all disabilities are duty related and two-thirds occur while off duty.

Mortality

The mortality rates used in this valuation are illustrated in Table A-5. A written description of each table used is included in Table A-1.

Other Terminations of Employment

The rates of assumed future withdrawal from active service for reasons other than death, disability, or retirement are shown for representative ages in Table A-6. Note that this assumption only applies to members who terminate and are not yet eligible for retirement.

Probability of Refund

Terminating members may forfeit a vested right to a deferred benefit if they elect a refund of their accumulated contributions. Table A-7 gives the assumed probability, at selected ages, that a terminating member will elect to receive a refund of his accumulated contributions instead of a deferred benefit.

If a member terminates with more than 20 years of service, there is assumed to be a 20% probability that the member will elect a refund.

Note that the probability of refund assumption only applies to members who terminate with a vested benefit and are not yet eligible for retirement.

Interest on Member Contributions

Interest on member contributions made prior to January 1, 2012 is assumed to accrue at a rate of 5.75% per annum, compounded annually. Interest on member contributions made on or after January 1, 2012 is assumed to accrue at 4.75%.

Portability

The cost of portability with other public retirement systems is not included in this valuation.

Probability of Marriage

We assumed 60% of the active members are married or have a registered domestic partner.

Commencement for Terminated Vested Members

Vested members who terminate but elect to leave their contributions in the System are assumed to commence receiving benefits at age 62.

Table A-1 Summary of Valuation Assumptions

January 1, 2016

I.	Economic assumptions	
	A. Price inflation	3.25%
	B. General wage increases	4.00
	C. Investment return	7.50
	D. Increase in membership	0.50
	E. Interest on member accounts	5.75/4.75*
II.	Demographic assumptions	
	A. Salary increases due to promotion and longevity	Table A-2
	B. Retirement	Table A-3
	C. Disability	Table A-4
	D. Mortality** among contributing members Men RP 2000 Employees Table for Males, with ages set back six years. Women RP 2000 Employees Table for Females, with ages set back six years.	Table A-5
	E. Mortality** among service retired members and beneficiaries Men RP2000 Combined Healthy Males, with ages set back two years. Women RP2000 Combined Healthy Females, with ages set back one year.	Table A-5
	F. Mortality** among disabled members Men RP2000 Disabled Males, with ages set back four years. Women RP2000 Disabled Females, with ages set back four years.	Table A-5
	G. Other terminations of employment	Table A-6
	H. Probabilities of vesting on termination	Table A-7

** Member contributions made prior to January 1, 2012 are assumed to accrue interest at 5.75%; contributions made on or after that date are assumed to accrue at 4.75%.*

*** All mortality tables are generational using Projection Scale AA to reflect expected future mortality improvement.*

Table A-2 Future Salaries

Annual Rate of Increase

Years of Service	Promotion and Longevity	Total*
0 to 1	4.50%	8.68%
1 to 2	3.50	7.64
2 to 3	2.75	6.86
3 to 4	2.00	6.08
4 to 5	1.50	5.56
9 to 10	0.80	4.83
14 to 15	0.45	4.47
19 to 20	0.29	4.30
24 to 25	0.25	4.26
29 to 30	0.25	4.26
35 or more	0.25	4.26

** Total rate shown reflects compounded effect of merit increase and assumed wage growth of 4.00%.*

Table A-3 Retirement

	Annual Probability					
	Men			Women		
		Eligible for Full Benefits			Eligible for Full Benefits	
Age	Eligible for Reduced Benefits	Less than 30 years of service	30 years or more of service	Eligible for Reduced Benefits	Less than 30 years of service	30 years or more of service
Less than 50	0.0%	8.0%	8.0%	0.0%	10.0%	10.0%
50	5.0	8.0	10.0	5.0	10.0	10.0
51	5.0	8.0	10.0	5.0	10.0	10.0
52	5.0	8.0	12.0	5.0	10.0	12.0
53	3.0	8.0	12.0	3.0	10.0	12.0
54	3.0	8.0	12.0	3.0	10.0	12.0
55	6.0	8.0	12.0	6.0	10.0	12.0
56	5.0	8.0	12.0	5.0	10.0	12.0
57	5.0	8.0	12.0	5.0	13.0	12.0
58	5.0	8.0	12.0	5.0	13.0	12.0
59	5.0	8.0	15.0	8.0	13.0	15.0
60	6.0	14.0	15.0	8.0	15.0	15.0
61	9.0	12.0	15.0	12.0	13.0	15.0
62	15.0	20.0	30.0	15.0	20.0	26.5
63	12.0	18.0	22.0	12.0	18.0	20.0
64	9.5	18.0	22.0	13.0	18.0	20.0
65		40.0	32.0		40.0	30.0
66		40.0	32.0		40.0	38.0
67		40.0	32.0		40.0	38.0
68		30.0	26.0		33.0	32.0
69		30.0	26.0		33.0	32.0
70		*	*		*	*

** Immediate retirement is assumed for every person age 70 or over.*

Table A-4 Disability*

Age	Annual Rates	
	Men	Women
20	.00%	.00%
25	.00	.00
30	.02	.02
35	.02	.02
40	.03	.03
45	.03	.03
50	.04	.04
55	.04	.04
60	.04	.04
65	.00	.00

** It is assumed that one-third of all disabilities are duty related and two-thirds are non-duty related.*

Table A-5 Mortality

	Annual Probability*					
	Contributing Members		Members Retired for Service and Beneficiaries of Members		Disabled Members	
Age	Men	Women	Men	Women	Men	Women
22	0.03 %	0.02 %	0.03 %	0.02 %	2.26 %	0.74 %
27	0.04	0.02	0.04	0.02	2.26	0.74
32	0.04	0.02	0.04	0.03	2.26	0.74
37	0.05	0.03	0.08	0.05	2.26	0.74
42	0.08	0.05	0.11	0.08	2.26	0.74
47	0.11	0.08	0.15	0.12	2.26	0.74
52	0.16	0.12	0.21	0.19	2.64	0.98
57	0.23	0.18	0.36	0.31	3.29	1.45
62	0.33	0.28	0.67	0.58	3.93	1.97
67	0.54	0.43	1.27	1.10	4.66	2.53
72	N/A	N/A	2.22	1.86	5.69	3.32
77	N/A	N/A	3.78	3.10	7.33	4.58
82	N/A	N/A	6.44	5.08	9.76	6.35
87	N/A	N/A	11.08	8.64	12.83	8.78
92	N/A	N/A	18.34	14.46	16.22	12.25

**The mortality rates shown above are generationally projected on an individual basis using Projection Scale AA for the valuation.*

Table A-6 Other Terminations of Employment Among Members Not Eligible to Retire

Years of Service	Annual Rates for Men	Annual Rates for Women
0 to 1	6.5%	8.5%
1 to 2	5.8	8.3
2 to 3	5.3	8.0
3 to 4	4.8	7.8
4 to 5	4.4	7.5
5 to 6	4.1	7.0
6 to 7	3.8	6.3
7 to 8	3.5	5.7
8 to 9	3.2	5.1
9 to 10	2.9	4.5
10 to 11	2.6	4.1
11 to 12	2.3	3.8
12 to 13	2.1	3.4
13 to 14	1.9	3.1
14 to 15	1.7	2.7
15 to 16	1.5	2.4
16 to 17	1.4	2.0
17 to 18	1.2	1.7
18 to 19	1.1	1.4
19 to 20	1.0	1.2
20 to 21	0.9	1.1
21 to 22	0.8	1.0
22 to 23	0.8	0.9
23 to 24	0.7	0.8
24 to 25	0.7	0.8
25 to 26	0.6	0.7
26 to 27	0.6	0.7
27 to 28	0.5	0.6
28 to 29	0.5	0.6
29 to 30	0.4	0.5
30 or more	0.5	0.5

Table A-7 Probability of Refund

Age	Probabilities of Refund upon Termination*
25	70.0%
30	65.0
35	55.0
40	48.0
45	43.0
50	38.0
55	36.0
60	40.0

** If service is 20 or more years at termination, probability of refund is equal to 20%.*

Appendix B Provisions of Governing Law

All actuarial calculations are based upon our understanding of the provisions governing the Seattle City Employees' Retirement System, Chapter 4.36 of the Seattle City Code. The benefit and contribution provisions are summarized briefly below, along with corresponding references to the City code. This summary encompasses the major provisions of the System; it does not attempt to cover all of the detailed provisions.

Effective Date

The effective date of the retirement system was July 1, 1929. (Section 4.36.080)

Members' Contribution Rate

The members' contribution rate is 10.03% of salary as of January, 2012. Certain members who were contributing at a lower rate on June 23, 1972 continue to contribute at a lower rate.
(Section 4.36.540A)

City Contribution Rate

The City contribution rate is the amount that is actuarially determined to be necessary to fund that portion of the retirement allowances not covered by the members' contributions. This amount shall be at least the members' contribution rate. (Section 4.36.545)

Final Compensation

Final compensation is based on highest average compensation (excluding overtime) during any consecutive 24 months.
(Sections 4.36.040 and 4.36.050)

Service Retirement

Eligibility
30 years of service;

Age 52 and 20 years of service;

Age 57 and 10 years of service; or

Age 62 and 5 years of service.

Normal Form
Straight life benefit.

Optional Forms
Actuarial equivalent according to the mortality and interest basis adopted by the Retirement Board for such purposes.

Service Retirement (continued)

Amount of Allowance

The total monthly allowance is generally 2% times final compensation times total years of creditable service.

However, if the member does not qualify in one of the following ways, the 2% factor is reduced by 0.1% for each year that retirement precedes the earliest date the member would be:

(a) Any age with 30 years of service.

(b) Age 51-59, providing the member's age and years of service total 80 or more.

(c) Age 60 or older with 20 years of service.

(d) Age 65 or older with five years of service.

The reduction is somewhat less than 0.1% for members with less than 20 years of service.

For those hired on or after January 1, 1988, creditable service excludes the first six months of service.

Maximum Allowance

The formula-based retirement allowance (as described above) of any member shall be limited to 60% of final compensation, except where the minimum allowance described below applies.

Minimum Allowance

A monthly benefit based on twice the actuarial value of accumulated member contributions. This is not subject to the 60% of final compensation maximum. (Sections 4.36.600, 4.36.605, 4.36.610 and 4.36.640)

Note: Effective January 1, 2011, the conversion of the contributions to an annuity benefit in the minimum allowance reflects option factors that use the new mortality rates.

Disability Retirement

Eligibility
Ten years of service credited within the 15 years preceding disability retirement. If disability occurs in the course of City employment, there is no service requirement.

Normal Form
Modified cash refund annuity. An optional survivor's benefit is available if the spouse is the beneficiary.

Amount of Allowance
The total monthly disability allowance is the greater of:

(a) 1.5% times final compensation times completed years of creditable service.

(b) 1.5% times final compensation times total years of creditable service that could have been earned to age 62, but not to exceed one-third of final compensation.

Maximum Allowance
The maximum disability allowance is 60% of final compensation.

Minimum Allowance
The minimum disability allowance is $140 per month.

(Sections 4.36.645 and 4.36.650)

Death Benefits

Retired Members
Death benefits to retired members are payable according to the form of retirement allowance elected.

Active Members

(a) Payment to the beneficiary of accumulated contributions, including interest; or

(b) If the member had completed 10 years of service at the time of death, a surviving spouse or a registered domestic partner may elect to receive, in place of (a) above, either:

  (1) A monthly allowance for life equal to the benefit the spouse would have received had the member just retired with a 100% contingent annuitant option in force; or

  (2) A cash payment of no more than one-half of the member's accumulated contributions, along with a correspondingly reduced retirement allowance.

(Section 4.36.680)

Withdrawal Benefits

Form
Payment of accumulated contributions, with interest.

(Section 4.36.665A)

Vested Withdrawal Benefits

Eligibility
Five years of service.

Amount of Allowance
Same as service retirement benefit.

Benefits Commence
Age 52, if 20 or more years of service;

Age 57, if 10-19 years of service; or

Age 62, regardless of years of service.

(Section 4.36.665)

Postretirement Benefit Increases

Provisions
Effective January 1, 2007, the City Council adopted a 65% Restoration of Purchasing Power benefit and an automatic 1.5% annual COLA to all members.

If the System reaches a 100% Funding Ratio, the restoration amount increases to 70%.

(Section 4.36.615)

Death Benefit System

Eligibility
Mandatory for all active members; optional for retired members.

Benefits
$2,000 upon the death of an active member or a participating retired member.

Assessment
Members pay an assessment of $12 per year; the City pays a matching amount. If these assessments are not adequate, additional amounts may be transferred from the interest earnings in the retirement fund.

(Sections 4.36.690 and 4.36.695)

Additional Contributions

Provisions
Members may voluntarily make contributions in excess of the regular rate; these are make-up contributions that apply only in specific situations.

Retirement Benefit
A monthly annuity which is the actuarial equivalent of accumulated additional contributions with interest.

Other Benefits
Accumulated additional contributions, with interest, generally become payable upon termination other than retirement.

(Sections 4.36.030 and 4.36.540A)

Appendix C Valuation Data

This valuation is based upon the membership of the system as of January 1, 2016. Membership data were supplied by the System and accepted for valuation purposes without audit. However, extensive tests were performed to ensure that the data are sufficiently accurate for valuation purposes.

The data for all contributing members, former contributing members, and their survivors are summarized in Table C-1.

Tables C-2 through C-4 present distributions of members receiving service retirement benefits, members receiving disability retirement benefits, and survivors receiving benefits. Shown in the tables are the numbers of persons receiving benefits, the total annual benefits received (including payments for the annual bonus), and the average annual benefit per recipient.

Table C-5 contains summaries of the data for contributing members. Values shown in the tables are the numbers of members and their total and average annual salaries.

The valuation also includes liabilities attributable to members who have terminated employment but have neither retired nor withdrawn their contributions.

Table C-1 Summary of Membership Data

	Contributing Members			Annuitants		
	Number	Annual Salaries ($1,000)	Average Annual Salaries	Number	Annual Benefits ($1,000)	Average Annual Benefits
January 1, 2016	8,882	$ 686,748	$ 77,317	6,223	$ 165,836	$ 26,650
January 1, 2015	8,746	647,800	74,068	6,019	155,597	25,852
January 1, 2014	8,603	606,888	70,548	5,880	147,145	25,026
January 1, 2013	8,465	579,396	68,449	5,742	137,836	24,006
January 1, 2012	8,430	560,412	66,476	5,580	128,645	23,056
January 1, 2011	8,599	569,472	66,225	5,428	118,920	21,909
January 1, 2010	9,071	596,892	65,802	5,304	108,886	20,529
January 1, 2008	8,842	529,062	59,835	5,201	102,772	19,760
January 1, 2006	8,521	468,096	54,934	5,011	83,988	16,761
January 1, 2004	8,382	441,562	52,680	4,876	74,341	15,246
January 1, 2002	8,758	418,908	47,831	4,733	61,801	13,058
January 1, 2000	8,669	382,620	44,137	4,681	55,542	11,865
January 1, 1999	7,779	333,984	42,934	4,644	52,482	11,301
January 1, 1998	7,926	329,028	41,512	4,649	50,394	10,840
January 1, 1996	8,078	314,448	38,926	4,619	44,271	9,585

Table C-2 Members Receiving Service Retirement Benefits as of January 1, 2016 – Inactive Lives

	<50	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Totals
Number of Persons											
Male	0	8	109	348	805	727	426	292	178	154	3,047
Female	0	22	135	395	709	477	225	154	107	116	2,340
Total	0	30	244	743	1,514	1,204	651	446	285	270	5,387
Annual Benefits in Thousands											
Male	$ 0	$ 332	$ 4,216	$ 12,872	$ 25,971	$ 21,601	$ 11,778	$ 7,214	$ 4,378	$ 3,150	$ 91,512
Female	0	793	5,188	12,913	19,992	11,304	4,660	2,905	1,672	1,355	60,782
Total	0	1,125	9,404	25,785	45,963	32,905	16,438	10,119	6,050	4,505	152,294
Average Annual Benefits											
Male	$ 0	$ 41,500	$ 38,679	$ 36,989	$ 32,262	$ 29,713	$ 27,648	$ 24,705	$ 24,596	$ 20,455	$ 30,033
Female	0	36,045	38,430	32,691	28,197	23,698	20,711	18,864	15,626	11,681	25,975
Total	0	37,500	38,541	34,704	30,359	27,330	25,250	22,688	21,228	16,685	28,271

Table C-3 Members Receiving Disability Retirement Benefits as of January 1, 2016 – Inactive Lives

	<50	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Totals
Number of Persons											
Male	1	3	5	4	3	4	3	4	1	1	29
Female	2	3	8	8	2	3	4	0	0	0	30
Total	3	6	13	12	5	7	7	4	1	1	59
Annual Benefits in Thousands											
Male	$ *	$ 57	$ 82	$ 74	$ 43	$ 50	$ 43	$ 54	$ *	$ *	$ 403
Female	33	62	158	115	44	34	42	0	0	0	488
Total	33	119	240	189	87	84	85	54	*	*	891
Average Annual Benefits											
Male	$ *	$ 19,000	$ 16,400	$ 18,500	$ 14,333	$ 12,500	$ 14,333	$ 13,500	$ *	$ *	$ 13,897
Female	16,500	20,667	19,750	14,375	22,000	11,333	10,500	0	0	0	16,267
Total	11,000	19,833	18,462	15,750	17,400	12,000	12,143	13,500	*	*	15,088

** Benefit amounts for groups with only one member not shown.*

Table C-4 Survivors Receiving Retirement Benefits as of January 1, 2016 – Inactive Lives

	<50	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Totals
Number of Persons											
Male	0	0	4	9	7	7	5	7	5	5	49
Female	6	8	20	40	60	68	61	80	114	180	637
Total	6	8	24	49	67	75	66	87	119	185	686
Annual Benefits in Thousands											
Male	$ 0	$ 0	$ 63	$ 159	$ 57	$ 128	$ 58	$ 75	$ 41	$ 28	$ 609
Female	58	169	357	799	1,130	1,269	1,015	1,415	1,753	2,651	10,616
Total	58	169	420	958	1,187	1,397	1,073	1,490	1,794	2,679	11,225
Average Annual Benefits											
Male	$ 0	$ 0	$ 15,750	$ 17,667	$ 8,143	$ 18,286	$ 11,600	$ 10,714	$ 8,200	$ 5,600	$ 12,429
Female	9,667	21,125	17,850	19,975	18,833	18,662	16,639	17,688	15,377	14,728	16,666
Total	9,667	21,125	17,500	19,551	17,716	18,627	16,258	17,126	15,076	14,481	16,363

Note: In addition, 32 male survivors are receiving $413,769 and 59 female survivors are receiving $1,012,034 in Option B or Option C benefits for a certain period only.

Table C-5 Distribution of Employees and Salaries as of January 1, 2016 – Active Lives

Number of Employees - By Age Group - Males

Nearest Year of Service	<20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	Totals
0		14	28	32	29	22	17	18	24	7	2		193
1	1	23	36	74	70	56	42	39	30	18		1	390
2		7	44	52	69	59	47	35	30	18	5	1	367
3-4		4	49	81	72	62	57	47	31	39	8	2	452
5-9		1	37	124	161	149	148	135	105	83	30	5	978
10-14			3	38	102	144	138	105	129	96	37	7	799
15-19				2	28	80	152	145	160	123	45	10	745
20-24						9	74	97	92	65	24	6	367
25-29							19	87	107	91	49	8	361
30-34								12	57	59	26	1	155
35-39								2	26	62	16	5	111
40+										14	15	10	39
Totals	1	49	197	403	531	581	694	722	791	675	257	56	4,957

Monthly Salaries in Thousands - By Age Group - Males

Nearest Year of Service	<20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	Totals
0	$	$ 49	$ 131	$ 162	$ 170	$ 126	$ 113	$ 114	$ 139	$ 45	$ 16	$	$ 1,065
1	1	83	179	459	434	390	273	240	175	102		9	2,345
2		25	217	327	443	408	337	230	227	124	23	7	2,368
3-4		11	246	494	505	428	405	343	238	316	56	17	3,059
5-9		4	186	726	1,088	1,050	1,008	914	733	542	184	20	6,455
10-14			12	218	643	945	934	674	846	587	224	28	5,111
15-19				12	176	587	1,048	1,023	1,154	800	307	65	5,172
20-24						51	555	700	651	465	163	27	2,612
25-29							147	667	776	642	357	47	2,636
30-34								81	454	452	190	9	1,186
35-39								15	201	488	126	28	858
40+										101	112	64	277
Totals	1	172	971	2,398	3,459	3,985	4,820	5,001	5,594	4,664	1,758	321	33,144

Table C-5 Distribution of Employees and Salaries as of January 1, 2016 – Active Lives (continued)

Average Monthly Salaries - By Age Group - Males

Nearest Year of Service	<20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	Totals
0	$	$ 3,500	$ 4,679	$ 5,063	$ 5,862	$ 5,727	$ 6,647	$ 6,333	$ 5,792	$ 6,429	$ 8,000	$	$ 5,518
1	1,000	3,609	4,972	6,203	6,200	6,964	6,500	6,154	5,833	5,667		9,000	6,013
2		3,571	4,932	6,288	6,420	6,915	7,170	6,571	7,567	6,889	4,600	7,000	6,452
3-4		2,750	5,020	6,099	7,014	6,903	7,105	7,298	7,677	8,103	7,000	8,500	6,768
5-9		4,000	5,027	5,855	6,758	7,047	6,811	6,770	6,981	6,530	6,133	4,000	6,600
10-14			4,000	5,737	6,304	6,563	6,768	6,419	6,558	6,115	6,054	4,000	6,397
15-19				6,000	6,286	7,338	6,895	7,055	7,213	6,504	6,822	6,500	6,942
20-24						5,667	7,500	7,216	7,076	7,154	6,792	4,500	7,117
25-29							7,737	7,667	7,252	7,055	7,286	5,875	7,302
30-34								6,750	7,965	7,661	7,308	9,000	7,652
35-39								7,500	7,731	7,871	7,875	5,600	7,730
40+										7,214	7,467	6,400	7,103
Totals	1,000	3,510	4,929	5,950	6,514	6,859	6,945	6,927	7,072	6,910	6,840	5,732	6,686

Table C-6 Distribution of Employees and Salaries as of January 1, 2016 – Active Lives

Number of Employees - By Age Group - Females

Nearest Year of Service	<20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	Totals
0		7	31	34	33	17	19	17	6	6	1		171
1	1	18	60	52	55	41	33	31	25	9	1		326
2		6	38	54	47	29	31	33	25	14	3		280
3-4		1	39	52	77	39	46	26	24	19	2	1	326
5-9		2	20	98	127	102	90	102	82	64	24	4	715
10-14			1	34	91	94	100	105	90	55	22	13	605
15-19				1	27	76	113	116	107	62	27	14	543
20-24					1	15	69	75	70	55	26	4	315
25-29							21	110	100	92	46	3	372
30-34								10	59	46	16	3	134
35-39								2	24	45	24	6	101
40+									2	19	13	3	37
Totals	1	34	189	325	458	413	522	627	614	486	205	51	3,925

Monthly Salaries in Thousands - By Age Group - Females

Nearest Year of Service	<20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	Totals
0	$	$ 15	$ 137	$ 187	$ 187	$ 95	$ 111	$ 95	$ 40	$ 51	$ 4	$	$ 922
1	1	63	273	297	358	258	200	193	151	66	1		1,861
2		23	176	295	286	176	187	229	175	100	16		1,663
3-4		5	176	309	473	263	292	153	171	125	7	8	1,982
5-9		4	77	508	744	643	543	613	519	410	131	17	4,209
10-14			2	167	526	646	662	698	560	349	142	40	3,792
15-19				3	131	493	738	784	719	367	142	46	3,423
20-24					6	97	401	492	475	379	144	10	2,004
25-29							124	713	650	590	306	20	2,403
30-34								74	429	305	105	18	931
35-39								16	165	289	165	41	676
40+									16	115	73	15	219
Totals	1	110	841	1,766	2,711	2,671	3,258	4,060	4,070	3,146	1,236	215	24,085

Table C-6 Distribution of Employees and Salaries as of January 1, 2016 – Active Lives (continued)

Average Monthly Salaries - By Age Group - Females

Nearest Year of Service	<20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	Totals
0	$	$ 2,143	$ 4,419	$ 5,500	$ 5,667	$ 5,588	$ 5,842	$ 5,588	$ 6,667	$ 8,500	$ 4,000	$	$ 5,392
1	1,000	3,500	4,550	5,712	6,509	6,293	6,061	6,226	6,040	7,333	1,000		5,709
2		3,833	4,632	5,463	6,085	6,069	6,032	6,939	7,000	7,143	5,333		5,939
3-4		5,000	4,513	5,942	6,143	6,744	6,348	5,885	7,125	6,579	3,500	8,000	6,080
5-9		2,000	3,850	5,184	5,858	6,304	6,033	6,010	6,329	6,406	5,458	4,250	5,887
10-14			2,000	4,912	5,780	6,872	6,620	6,648	6,222	6,345	6,455	3,077	6,268
15-19				3,000	4,852	6,487	6,531	6,759	6,720	5,919	5,259	3,286	6,304
20-24					6,000	6,467	5,812	6,560	6,786	6,891	5,538	2,500	6,362
25-29							5,905	6,482	6,500	6,413	6,652	6,667	6,460
30-34								7,400	7,271	6,630	6,563	6,000	6,948
35-39								8,000	6,875	6,422	6,875	6,833	6,693
40+									8,000	6,053	5,615	5,000	5,919
Totals	1,000	3,235	4,450	5,434	5,919	6,467	6,241	6,475	6,629	6,473	6,029	4,216	6,136

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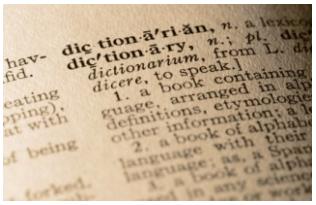
Appendix D Glossary



The following definitions are largely excerpts from a list adopted in 1981 by the major actuarial organizations in the United States. In some cases the definitions have been modified for specific applicability to the Seattle City Employees' Retirement System. Defined terms are capitalized throughout this Appendix.

Accrued Benefit — The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

Actuarial Accrued Liability — That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Actuarial Assumptions — Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation, rates of investment earnings, and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

Actuarial Cost Method — A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

Actuarial Gain (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.

Actuarial Present Value — The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Valuation — The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets — The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

Actuarially Equivalent — Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

Amortization Payment — That portion of the pension plan contribution that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability (UAAL).

Entry Age Actuarial Cost Method	A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.
Funding Ratio	The Actuarial Value of Assets divided by the Actuarial Accrued Liability. May also be calculated as the Market Value of Assets divided by the Actuarial Accrued Liability, in which case it is indicated that the Funding Ratio is shown on a Market Value basis.
Normal Cost	That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.
Projected Benefits	Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.
Surplus Funding	The excess of the Actuarial Value of Assets over the Actuarial Accrued Liability.
Unaccrued Benefit	The excess of an individual's Projected Benefits over the Accrued Benefits as of a specified date.
Unfunded Actuarial Accrued Liability	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.