Gabriel Roeder Smith & Company
Consultants & Actuaries

OKLAHOMA CITY EMPLOYEE RETIREMENT SYSTEM

ANNUAL ACTUARIAL VALUATION

DECEMBER 31, 2016

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GRS
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June 26, 2017

The Board of Trustees
Oklahoma City Employee Retirement System
Oklahoma City, Oklahoma

Dear Board Members:

The results of the December 31, 2016 annual actuarial valuation of the Oklahoma City Employee Retirement System are presented in this report. The purpose of the valuation is to measure the System's funding progress and to determine the employer contribution for the fiscal year beginning July 1, 2018. This report should not be relied upon for any other purpose. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report. Future actuarial measurements may differ significantly from those presented in this report due to such factors as experience differing from that anticipated by actuarial assumptions, changes in plan provisions, actuarial assumptions/methods 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 valuation was based upon the actuarial assumptions and methods adopted by the Board, information, furnished by the Retirement System, concerning Retirement System benefits, financial transactions, plan provisions, individual members, terminated members, retirees and beneficiaries. Data was checked for internal reasonability and year-to-year consistency, but was not audited by us. As a result, we are unable to assume responsibility for the accuracy or completeness of the information provided.

The fiscal year 2019 contribution rate shown in this report was based on the actuarial assumptions and methods shown in Section C of this report. This report includes risk metrics on page A-4 but does not include additional risk metrics such as those that access the risk of future experience not meeting actuarial assumptions. These additional risk assessments were beyond the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material impact on the plan’s financial condition.

To the best of our knowledge, this report is complete and accurate and the valuation was conducted in accordance with standards of practice prescribed by the Actuarial Standards Board and in compliance with the applicable state statutes. Louise Gates and Mark Buis are independent of the plan sponsor and are Members of the American Academy of Actuaries (MAAA) who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. It is our opinion that the actuarial assumptions used for the valuation are reasonable.

Respectfully submitted,

Louise Gates ASA, MAAA

Mark Buis, FSA, EA, FCA, MAAA

SECTION A

VALUATION RESULTS

Funding Objective

The funding objective of the Retirement System is to establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level from year-to-year and will not have to be increased for future generations of citizens.

Contribution Rates

The Retirement System is supported by member contributions, City contributions and investment income from Retirement System assets.

Contributions which satisfy the funding objective are determined by the annual actuarial valuation and are sufficient to:

(1) Cover the actuarial present value of benefits allocated to the current year by the actuarial cost method described in Section C (the normal cost); and

(2) Finance over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (unfunded actuarial accrued liability).

Computed contribution rates for the fiscal year beginning July 1, 2018 are shown on page A-2.

COMPUTED CONTRIBUTIONS
EXPRESSED AS PERCENTAGES OF ACTIVE MEMBER PAYROLL

The December 31, 2016 valuation results (contribution rates) will be used by the City for the fiscal year beginning July 1, 2018. The total computed contribution rates determined in the current and prior year's valuation are also shown below.

Development of the Employer Contribution Rate

Contributions for	Employer %
Normal Cost	
Service pensions	10.40%
Disability pensions	0.53%
Survivor pensions	
- Death before retirement	0.41%
Termination benefits	
- Deferred service pensions	0.31%
- Refunds of current member contributions	0.97%
Total normal cost	12.62%
Unfunded Actuarial Accrued Liability (UAAL)	
UAAL credit[1]	(1.39%)
Total Computed Contribution Rate	11.23%
Member contribution rate	6.00%
City's computed rate	5.23%

Computed Contribution Rates as of December 31st of the Indicated Valuation Year

	Employer Contribution %	
Contributions for	**2016**	**2015**
Total Normal Cost	12.62%	12.61%
Member Portion	6.00%	6.00%
City Portion	6.62%	6.61%
UAAL Credit[1]	(1.39%)	(1.33%)
City Contribution	5.23%	5.28%

[1] *The unfunded actuarial accrued liability (the UAAL) was amortized as a level percent of active member payroll over a period of 25 years in 2016 and 26 years in 2015.*

Funding Progress Indicators

There is no single all-encompassing indicator to measure a retirement system's funding progress. A traditional measure has been the relationship of valuation assets to actuarial accrued liability - a measure that is influenced by the choice of actuarial cost method. Numeric information using this traditional measure is shown on the following page.

Additional understanding of funding progress can be achieved using the following tests, which compare the System's assets with:

(1) members' contributions on deposit in the System;
(2) present value of future benefits to present retired lives; and
(3) present value of benefits based on service already rendered by active and inactive members.

In a system that has been following the discipline of level percent-of-payroll financing, member contributions on deposit (item 1) and the present value of future benefits to present retired lives (item 2) will be fully covered by present assets (except in rare circumstances). In addition, the present value of benefits based on service already rendered by members (item 3) will be partially covered by the remainder of present assets. The larger the funded portion of item 3, the stronger the condition of the system. Generally, if the system has been using level-percent financing, the funded portion of item 3 will increase over time. A historical comparison of funding progress tests is shown on the following page.

Limitations of the Funding Progress (funded status) Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based on the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to the funded status measurements shown in this report we note the following:

The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan’s benefit obligations.

The measurement is inappropriate for assessing the need for or the amount of future employer contributions.

The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

FUNDING PROGRESS TEST
(DOLLAR AMOUNTS IN THOUSANDS)

Valuation Date	Accrued Liabilities (AL) (1) Member Contribs.	(2) Retirants and Beneficiaries	(3) Active & Inactive Members (Employer Financed Portion)	Total AL	Funding Value of Assets	Portion of Liabilities Covered by Assets (1)	(2)	(3)	Overall
12/31/97	$35,654	$ 76,275	$ 107,169	$ 219,098	$ 219,602	100 %	100 %	100 %	100 %
12/31/98	37,900	82,258	118,498	238,656	260,877	100	100	119	109
12/31/99	39,866	85,724	120,316	245,906	307,872	100	100	152	125
12/31/00	41,550	100,936	180,814	323,300	350,398	100	100	115	108
12/31/01	42,226	116,552	185,819	344,597	372,737	100	100	115	108
12/31/02	44,368	128,120	200,072	372,560	375,382	100	100	101	101
12/31/03	46,654	136,873	207,496	391,023	374,192	100	100	92	96
12/31/04	48,487	150,664	216,013	415,164	381,495	100	100	84	92
12/31/05	54,239	169,752	212,913	436,904	424,182	100	100	94	97
12/31/06	55,557	187,693	214,297	457,547	476,913	100	100	109	104
12/31/07	60,118	204,470	224,239	488,827	529,876	100	100	118	108
12/31/08	62,128	221,456	235,650	519,234	528,664	100	100	104	102
12/31/09	65,106	237,302	254,019	556,427	529,137	100	100	89	95
12/31/10	64,922	267,120	234,792	566,834	524,731	100	100	82	93
12/31/11	67,324	252,166	214,229	533,719	514,499	100	100	91	96
12/31/12	69,987	257,057	226,544	553,588	547,686	100	100	97	99
12/31/13	72,209	281,206	228,451	581,866	589,527	100	100	103	101
12/31/14	74,142	297,061	236,092	607,295	628,686	100	100	109	104
12/31/15	74,832	320,443	238,710	633,985	665,077	100	100	113	105
12/31/16	76,435	347,246	237,531	661,212	692,359	100	100	113	105

COMMENTS

Comment A: As of the valuation date, the Retirement System has a funding surplus. Based on the current Retirement System funding policy, the surplus was amortized and used as a credit against City normal cost contributions, resulting in a City pension contribution rate of 5.23% of plan member payroll for the City's 2018-2019 fiscal year. The established maximum City contribution rate is 10% of payroll. It is important to note that once the funding surplus is depleted, City contributions will increase to the level of normal cost contributions plus any necessary UAAL payments.

Comment B: There were no benefit changes reported to the actuary in connection with this valuation of the System. In addition, there were no changes in the actuarial assumptions or methods used in the valuation of the System.

Comment C: During the year ended December 31, 2016, the return on System assets was lower than long term expectations. The market value smoothing techniques used in this valuation of the System recognize both past and present investment experience. As a result, the rate of return on valuation assets was 6.84% during calendar year 2016. This unfavorable experience was offset in part by actuarial gains due to a higher number of plan member terminations than projected by actuarial assumptions. Additional information on the investment experience is provided on page B-4 of this report.

Comment D: The System's funding percent based on the actuarial value of assets was 105%. Last year the funding percent measured on the same basis was 105%. If the market value of assets was used as the basis for the funded ratio the result would be 100% as of December 31, 2016. Unless otherwise indicated, a funding status measurement presented in this report is based upon the actuarial accrued liability and the funding value of assets. It is important to note that the funding status measurement in this report is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations and the need for or the amount of future employer contributions.

Comment E: Actuarial Standards of Practice No. 35 requires certain disclosures related to mortality assumptions used in pension valuations. Specifically, it indicates that there should be sufficient detail to permit another qualified actuary to understand the provision made for future mortality improvement. Based on the 2017 experience study for the Oklahoma Public Employees Retirement System, we recommend a review of the mortality assumption to determine the appropriate margin for future mortality improvement for use in the 2017 and future valuations of this Retirement System.

UNFUNDED ACTUARIAL ACCRUED LIABILITY
(AMOUNTS IN THOUSANDS OF DOLLARS)

	December 31	
	2016	**2015**
A. Actuarial present value of future benefits	$803,023	$777,405
B. Actuarial present value of future normal costs	141,811	143,420
C. Actuarial accrued liability	661,212	633,985
D. Assets allocated to funding	692,359	665,077
E. Unfunded actuarial accrued liability	(31,147)	(31,092)
F. Ratio of assets to actuarial accrued liability	105%	105%

HISTORICAL SCHEDULE OF CITY CONTRIBUTION RATES AND THE ASSOCIATED AMORTIZATION PERIODS

Valuation Date December 31	Established City Contribution Rate as a % of Active Member Payroll	Years to Amortize UAL
2002	7.00 %	3.8
2003	7.00	40.0
2004 #	8.25	40.0
2005	7.94	30.0
2006	6.16	29.0
2007	5.04	28.0
2008	6.77	27.0
2009	8.56	26.0
2010	9.49	25.0
2011 *	7.15	30.0
2012	6.44	29.0
2013 ^	5.88	28.0
2014	5.33	27.0
2015 ^	5.28	26.0
2016	5.23	25.0

* *Retirement System amended.*
\# *The average established City contribution for the indicated fiscal year.*
^ *Change in Actuarial Assumptions.*

SECTION B

SUMMARY OF BENEFIT PROVISIONS, ASSETS AND VALUATION DATA

SUMMARY OF BENEFIT PROVISIONS EVALUATED OR CONSIDERED

(DECEMBER 31, 2016)

Regular Retirement (no reduction factor for age)

Eligibility - Pre 3-1-67 hires: Age 60 with 20 years of service; or, any age with 30 years of service.
Post 3-1-67 hires: Age 65 with 5 years of service; or, any age with 25 years of service.

Annual Amount - Normal retirement benefit: 2% of average final compensation for all years and complete months of service, to a maximum of 100% of AFC.

Average Final Compensation (AFC) - Average earned compensation (excluding compensation for unused vacation and sick leave) during highest 36 months of service out of the last 60 consecutive months of service.

Early Retirement (reduction factor for age)

Eligibility - Age 55 with 5 years of service.

Annual Amount - Same as regular retirement amount but reduced 4% for each full year or portion of a year that payments commence prior to age 65 (age 60 if hired prior to 3-1-67).

Deferred Retirement (vested benefit)

Eligibility - 5 years of service. Benefit begins at age 65 (age 60 if hired prior to 3-1-67) or at age 55 on a reduced basis.

Annual Amount - Same as regular retirement based on service and average final compensation at time of termination.

Duty Disability Retirement

Eligibility - No age or service requirements.

Annual Amount - 40% of average final compensation, reduced if degree of disability is less than total disability.

Non-Duty Disability Retirement

Eligibility - Any age with 15 years of service.

Annual Amount - 2% of average final compensation for each full year of service, plus 1/12 of 2% for each full month of service due to a partial year of service to a maximum of 40% of AFC. Amount is reduced if degree of disability is less than total disability.

SUMMARY OF BENEFIT PROVISIONS EVALUATED OR CONSIDERED

(DECEMBER 31, 2016)

Duty Death Before Retirement

Eligibility - No age or service requirements.

Annual Amount - 20% of average final compensation to an eligible spouse. Payments cease upon death. If there is no eligible spouse, accumulated employee contributions are paid to designated beneficiary. For members eligible under age and service conditions, the benefit is the amount the spouse would have received as a joint annuitant under normal or early retirement conditions.

Non-Duty Death Before Retirement

Eligibility - Any age with 15 years of service.

Annual Amount - Same as duty death.

Post-Retirement Adjustments

Pensions may be adjusted annually (in January) for changes in the Consumer Price Index. The maximum adjustment is 2% per year compounded. The first adjustment is made one year following retirement for those age 65 (60 for pre 3-1-67 hires) or those awarded disability allowances. For all others, the first adjustment is made no earlier than 4 years following retirement.

Post-Retirement Death Benefit

Eligibility – Retiree currently collecting pension benefits from the System.

Amount – A one-time payment of $5,000 payable upon the death of the retiree. This benefit is payable only upon the death of the retiree, and is payable to the designated beneficiary.

Member Contributions

6% of annual pay.

Employer Contributions

7% of annual payroll effective March 2, 2001 – December 31, 2005.

The actuarially determined contribution rate (up to a maximum of 10% of pay) effective January 1, 2006.

Partial Lump Sum Payment Option

Members who are eligible for Regular Retirement may elect this optional form of payment, which allows for cash at retirement of up to $30,000. Any remaining monthly retirement benefit is reduced actuarially to reflect the payment of cash at retirement.

ASSET INFORMATION SUBMITTED FOR VALUATION

The net market value of Retirement System assets was reported to be $658,201,646 as of December 31, 2016. The derivation of the funding value of assets used for the actuarial valuation is shown on the following page.

Revenues and Expenditures – Market Value Basis

	Year Ended December 31, 2016	Year Ended December 31, 2015
Revenues:		
a. Member contributions	$ 7,498,942	$ 7,814,431
b. City contributions	6,997,507	7,997,221
c. Investment income		
1. Interest and dividends	10,122,528	9,947,521
2. Realized & unrealized gain/(loss)	28,813,246	(11,786,288)
3. Securities lending income	0	117,084
d. Other	17,206	17,468
e. Total revenues	$53,449,429	$ 14,107,437
Expenditures:		
a. Refunds of member contributions	$ 1,167,470	$ 1,038,147
b. Benefits paid	30,925,582	28,868,251
c. Administrative expenses	418,485	436,224
d. Investment expenses	1,650,043	1,706,463
e. Other expenses	4,400	0
f. Total expenditures	$ 34,165,980	$ 32,049,085
Reserve Increase (Decrease):		
Total revenues minus total expenditures	$ 19,283,449	$ (17,941,648)

Reported Market Value of Assets

	December 31, 2016
Cash & Other	$ 41,441,353
Fixed Income	132,028,475
Equities	439,421,378
Real Estate	51,387,741
Total Assets	664,278,947
Less Accounts Payable/Other	6,077,301
Net Assets	$658,201,646

DEVELOPMENT OF VALUATION ASSETS

Year Ended December 31:	2015	2016
A. Funding Value Beginning of Year	$628,685,577	$665,076,625
B. Market Value End of Year	638,918,197	658,201,646
C. Market Value Beginning of Year	656,859,845	638,918,197
D. Non-Investment Net Cash Flow	(14,077,278)	(17,579,397)
E. Investment Income		
E1. Market Total: B - C - D	(3,864,370)	36,862,846
E2. Amount for Immediate Recognition (7.4%)	46,623,520	48,565,233
E3. Amount for Phased-In Recognition: E1-E2	(50,487,890)	(11,702,387)
F. Phased-In Recognition of Investment Income		
F1. Current Year: 0.25 x E3	$ (12,621,973)	$ (2,925,597)
F2. First Prior Year	(136,772)	(12,621,973)
F3. Second Prior Year	11,981,032	(136,772)
F4. Third Prior Year	4,622,519	11,981,032
F5. Total	3,844,806	(3,703,310)
G. Funding Value End of Year: A + D + E2 + F5	665,076,625	692,359,151
H. Difference between Market & Funding Value	(26,158,428)	(34,157,505)
I. Net Recognized Rate of Return - Funding Value Basis	8.12%	6.84%
J. Net Recognized Rate of Return - Market Value Basis	(0.59%)	5.85%
K. Ratio of Funding Value to Market Value	1.041	1.052

RETIRANT AND BENEFICIARY DATA

Valuation Date	No. of Pension Recipients				Total Annual	% of	Average Annual	% Incr. in Total
Dec. 31	Service	Disability	Survivor	Total	Pensions[2]	Payroll	Pension	Pensions
1997	634	54	200	888	$ 6,818,103	9.1 %`	$ 7,678	4.8 %
1998	633	56	202	891	7,134,692	9.0	8,008	4.6
1999	643	56	202	901	7,470,215	9.2	8,291	4.7
2000 [1]	646	61	203	910	9,188,323	11.4	10,097	23.0
2001	694	63	205	962	10,386,513	12.4	10,797	13.0
2002	725	65	210	1,000	11,261,772	13.0	11,262	8.4
2003	731	68	207	1,006	11,972,938	14.0	11,902	6.3
2004	773	66	207	1,046	13,038,432	14.7	12,465	8.9
2005	796	67	213	1,076	14,355,655	15.7	13,342	10.1
2006	823	69	221	1,113	15,766,306	16.5	14,166	9.8
2007	854	66	233	1,153	17,117,037	17.2	14,846	8.6
2008	894	59	225	1,178	18,459,873	17.5	15,671	7.8
2009	936	56	226	1,218	19,673,159	17.8	16,152	6.6
2010	995	59	229	1,283	21,945,667	21.3	17,105	11.6
2011	1,018	56	225	1,299	22,946,844	21.0	17,665	4.6
2012	1,030	55	239	1,324	23,757,916	20.7	17,944	3.5
2013	1,062	54	229	1,345	25,047,506	21.0	18,623	5.4
2014	1,101	55	224	1,380	26,599,897	21.4	19,275	6.2
2015	1,144	55	223	1,422	28,481,665	22.2	20,029	7.1
2016	1,211	57	223	1,491	30,700,847	24.2	20,591	7.8

(1) Reflects a one-time increase resulting from purchasing power study.

(2) Annual pension amounts shown above are reported to the actuary by the City and reflect annualized pension payments as of the indicated valuation date.

PENSIONS BEING PAID DECEMBER 31, 2016
TABULATED BY AGE OF RECIPIENT

	Service Pensions		Disability Pensions		Survivor Pensions		Totals	
Age	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions
Under 45					1	$ 11,868	1	$ 11,868
45 - 49	11	$ 315,336	1	$ 17,196	4	62,484	16	395,016
50 - 54	38	1,056,456	3	41,568	7	93,780	48	1,191,804
55 - 59	140	3,876,024	11	141,732	15	226,620	166	4,244,376
60 - 64	229	5,678,772	19	240,927	20	341,544	268	6,261,243
65 - 69	275	6,434,043	10	83,928	28	418,392	313	6,936,363
70 - 74	207	4,333,284	4	54,036	30	393,156	241	4,780,476
75 - 79	148	2,731,284	4	33,948	40	623,789	192	3,389,021
80 - 84	94	1,683,120	3	27,600	34	360,396	131	2,071,116
85 - 89	49	744,108	1	11,556	21	229,692	71	985,356
90+	20	273,480	1	10,908	23	149,820	44	434,208
Totals	**1,211**	**$27,125,907**	**57**	**$663,399**	**223**	**$2,911,541**	**1,491**	**$30,700,847**

PENSIONS BEING PAID DECEMBER 31, 2016
TABULATED BY YEAR OF RETIREMENT

Year of Retirement	No. #	Annual Pensions Total	Annual Pensions Average
1970 - 1974	1	$ 10,904	$ 10,904
1975 - 1979	5	55,608	11,122
1980 - 1984	16	156,708	9,794
1985	3	43,822	14,607
1986	9	123,890	13,766
1987*	35	612,212	17,492
1988	6	61,788	10,298
1989	7	126,407	18,058
1990	6	107,135	17,856
1991	13	194,757	14,981
1992	13	116,431	8,956
1993	11	84,886	7,717
1994	17	299,596	17,623
1995	23	327,333	14,232
1996	27	428,822	15,882
1997	24	332,030	13,835
1998	25	317,626	12,705
1999	29	402,416	13,876
2000	34	497,003	14,618
2001	61	1,286,268	21,086
2002	53	926,285	17,477
2003	46	948,814	20,626
2004	66	1,265,214	19,170
2005	58	1,229,053	21,191
2006	65	1,466,455	22,561
2007	73	1,480,353	20,279
2008	69	1,385,895	20,085
2009	75	1,753,258	23,377
2010	113	2,623,992	23,221
2011	65	1,438,476	22,130
2012	64	1,325,196	20,706
2013	84	1,892,169	22,526
2014	87	2,017,631	23,191
2015	101	2,681,371	26,548
2016	107	2,681,043	25,056
Totals	**1,491**	**$30,700,847**	**$20,591**

** Reflects early retirement incentive program.*

 # Includes surviving spouses of deceased retirees.

SYSTEM MEMBERS INCLUDED IN VALUATION
COMPARATIVE SCHEDULE

Valuation Date Dec. 31	Number of Active Members	Number of Inactive Members	Annual Payroll[1]	Active Member Averages Age	Active Member Averages Service	Active Member Averages Pay	Ratio of Active to Retired Members	% Increase/ (Decrease) in Avg Pay
1996	2,401	17	$70,972	42.8 yrs.	10.9 yrs.	$29,559	2.7	2.9 %
1997	2,418	19	74,752	43.3	11.1	30,908	2.7	4.6
1998	2,404	25	79,195	43.7	11.6	32,929	2.7	6.5
1999	2,453	36	80,897	43.8	11.6	32,979	2.7	0.2
2000	2,454	41	80,503	44.0	11.6	32,805	2.7	(0.5)
2001	2,454	49	83,862	44.0	11.4	34,174	2.6	4.2
2002	2,374	55	86,428	44.5	11.7	36,406	2.4	6.5
2003	2,290	61	85,666	45.2	12.3	37,409	2.3	2.8
2004	2,302	54	88,866	45.2	12.3	38,604	2.2	3.2
2005	2,312	58	91,641	45.5	12.3	39,637	2.1	2.7
2006	2,353	62	95,504	45.5	12.1	40,588	2.1	2.4
2007	2,380	66	99,574	45.5	12.0	41,838	2.1	3.1
2008	2,422	71	105,566	45.8	11.9	43,586	2.1	4.2
2009	2,380	73	110,408	46.3	12.3	46,390	2.0	6.4
2010	2,304	81	102,915	46.4	12.3	44,668	1.8	(3.7)
2011	2,398	75	109,293	46.3	12.1	45,577	1.8	2.0
2012	2,459	83	114,933	46.4	12.0	46,740	1.9	2.6
2013	2,487	82	119,457	46.4	11.9	48,032	1.8	2.8
2014	2,500	82	124,142	46.5	11.9	49,657	1.8	3.4
2015	2,586	89	128,499	46.5	11.3	49,690	1.8	0.1
2016	2,506	108	127,017	46.6	11.6	50,685	1.7	2.0

[1] *In thousands of dollars.*

INACTIVE MEMBERS - DECEMBER 31, 2016
ELIGIBLE FOR DEFERRED PENSIONS
TABULATED BY AGE

Age	No.	Estimated Annual Allowances
Under 40	16	$ 93,338
40	2	15,681
41	1	11,868
42	7	59,562
43	3	30,923
44	5	47,943
45	5	54,837
46	6	48,807
47	5	70,084
48	4	28,576
50	1	26,324
51	3	29,487
52	6	66,395
53	5	68,093
54	9	101,447
55	4	54,897
56	4	79,994
57	3	22,201
58	2	8,790
59	3	60,940
60 & Over	14	143,710
Totals	**108**	**$1,123,897**

ACTIVE MEMBERS AS OF DECEMBER 31, 2016
BY AGE AND YEARS OF SERVICE

	Years of Service on Valuation Date							Totals	
Age	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	2							2	$ 55,652
20-24	52							52	1,466,992
25-29	149	28						177	6,398,480
30-34	134	73	23					230	9,396,106
35-39	137	92	42	24				295	13,042,809
40-44	102	60	68	52	9	1		292	15,276,378
45-49	90	73	45	58	39	19		324	16,889,375
50-54	72	63	49	71	58	41	37	391	21,635,156
55-59	74	60	48	54	55	47	58	396	21,993,376
60	11	8	8	14	4	9	11	65	4,022,276
61	10	8	12	5	6	5	16	62	3,572,608
62	7	4	7	5	2	10	12	47	2,748,168
63	4	10	3	9	5	12	6	49	3,024,513
64	4	4	3	7	7	5	6	36	2,205,103
65	2	1	4	6	1		6	20	1,158,929
66	4	2	3	4	2	2	2	19	1,194,757
67	2	3	2	2	3	2	6	20	1,226,706
68	1	1	1	1		3	1	8	572,882
69	1	1	2	2				6	351,417
70			1		1			2	113,634
71		1					1	2	157,825
72	2			1		1		4	171,015
73		1			1	1		3	175,917
77			1					1	48,344
79+	1	1			1			3	118,492
Totals	**861**	**494**	**322**	**315**	**194**	**158**	**162**	**2,506**	**$127,016,910**

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Group Averages:

Age: 46.6 years
Service: 11.6 years
Annual Pay: $50,685

SCHEDULE OF
RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS
COMPARATIVE STATEMENT

Year Ended Dec. 31	Added to Rolls [2]		Removed from Rolls		Rolls End of Year			% Incr. in Benefits
	No.	Annual Benefits [1]	No.	Annual Benefits	No.	Annual Benefits	Avg. Annual Benefits	
2008	85	$2,109,746	60	$766,910	1,178	$ 18,459,873	$ 15,671	7.8 %
2009	86	1,905,592	46	692,306	1,218	19,673,159	16,152	6.6
2010	120	3,059,254	55	786,746	1,283	21,945,667	17,105	11.6
2011	70	1,778,917	54	777,740	1,299	22,946,844	17,665	4.6
2012	74	1,467,021	49	655,949	1,324	23,757,916	17,944	3.5
2013	86	2,215,300	65	925,710	1,345	25,047,506	18,623	5.4
2014	95	2,483,415	60	931,024	1,380	26,599,897	19,275	6.2
2015	102	2,868,873	60	987,105	1,422	28,481,665	20,029	7.1
2016	108	2,856,572	39	637,390	1,491	30,700,847	20,591	7.8

(1) Includes post retirement cost-of-living adjustments.
(2) Includes reported data corrections.

SECTION C

ACTUARIAL METHODS, ACTUARIAL ASSUMPTIONS AND DEFINITION OF TECHNICAL TERMS

THE ACTUARIAL VALUATION PROCESS

The ***actuarial valuation*** is the mathematical process by which actuarial present values and contribution rates are determined. The flow of activity constituting the valuation may be summarized as follows:

A. ***Census data***, furnished by plan administrator, including:
   Retired lives now receiving benefits
   Former employees with vested benefits not yet payable
   Active employees

B. + ***Benefit provisions***, furnished by plan administrator

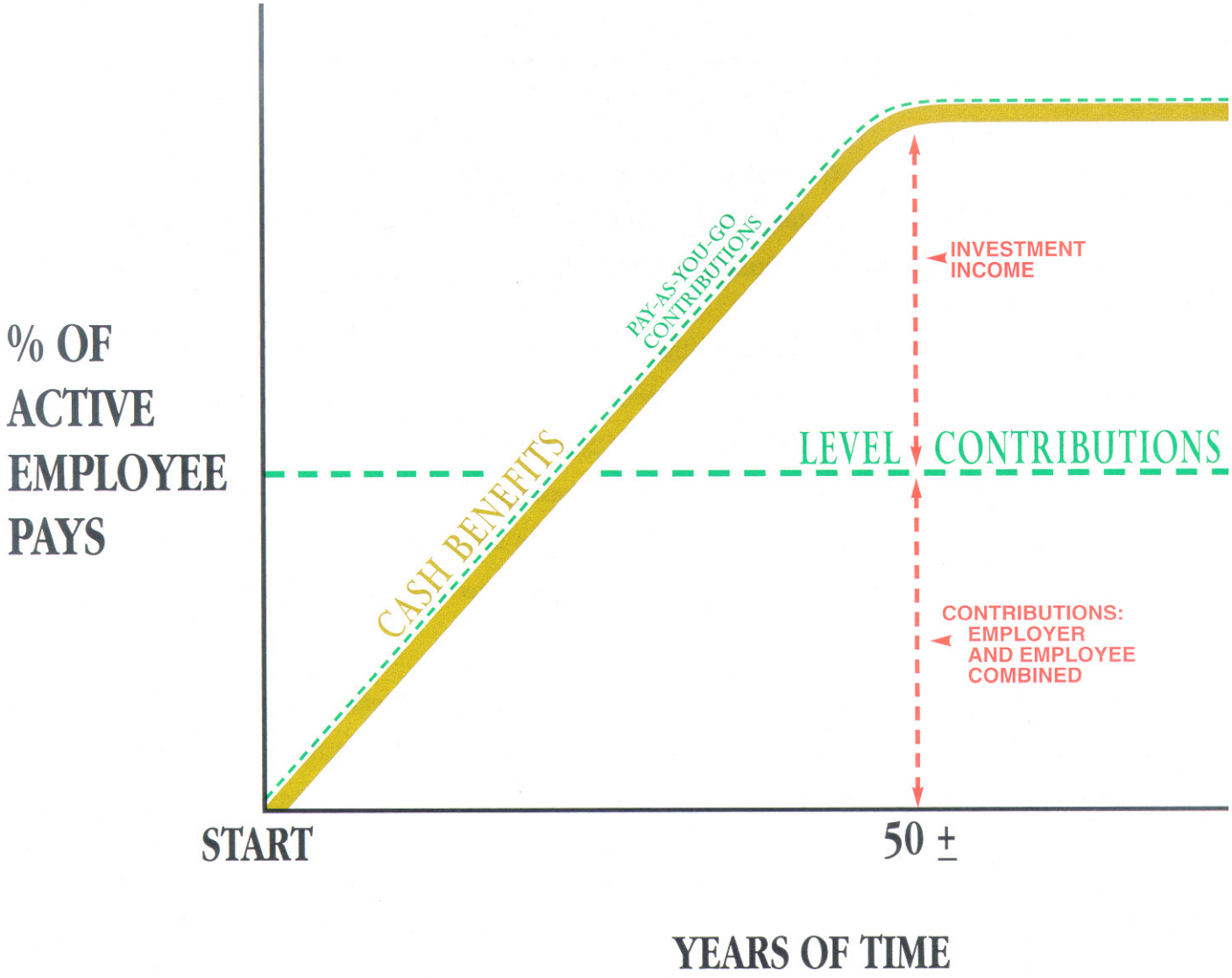
C. + ***Asset data*** (cash & investments), furnished by plan administrator

D. + ***Assumptions concerning future experience*** in various risk areas

E. + The ***funding method*** for employer contributions (the long-term, planned pattern for employer contributions)

F. + ***Mathematically combining the assumptions, the funding method and the data***

G. = Determination of:
   Plan Financial Position and/or
   New Employer Contribution Rate



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

Economic Risk Areas
- Rates of investment return
- Rates of pay increase
- Changes in active member group size

Non-Economic Risk Areas
- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

ACTUARIAL METHODS

Actuarial Cost Method

The actuarial cost method is a procedure for allocating the actuarial present value of pension plan benefits and expenses to time periods. The method used for the valuation is known as the individual entry-age actuarial cost method and has the following characteristics:

(i) The annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's pension at time of retirement; and

(ii) Each annual normal cost is a constant percentage of the member's year by year projected compensation.

The entry-age actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's compensation between the entry age of the member and the assumed exit ages.

The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future normal costs is called the actuarial accrued liability. Deducting System assets from the actuarial accrued liability determines the unfunded actuarial accrued liability.

Actuarial Value of Assets

The funding value of assets recognizes assumed investment income fully each year. Differences between actual and assumed investment income are phased-in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, funding value of assets will tend to be lower than market value. During periods when investment performance is less than the assumed rate, funding value of assets will tend to be greater than market value. The funding value of assets is unbiased with respect to market value. At any time it may be either greater or less than market value. If assumed rates are exactly realized for 4 consecutive years, it will become equal to market value.

ACTUARIAL ASSUMPTIONS

Funding objective contribution requirements and actuarial present values are calculated by applying actuarial assumptions to the benefit provisions and people information of the System, using the actuarial cost method described on page C-3.

The principal areas of risk which require actuarial assumptions about future experiences are:

(i) long-term rates of investment return to be generated by the assets of the System
(ii) patterns of pay increases to members
(iii) rates of mortality among members and retired lives
(iv) rates of withdrawal of active members
(v) rates of disability among active members
(vi) the age patterns of actual retirements

In a valuation, the monetary effect of each assumption projected is for as long as a present covered person or potential beneficiary survives, a period of time which can be as long as a century. The actual experience of the System will not coincide exactly with assumed experience. From time-to-time one or more of the assumptions are modified to reflect experience trends (but not random or temporary year to year fluctuations).

The actuarial assumptions were based upon the results of an experience study for this Retirement System covering the period January 1, 2008 through December 31, 2012. A report dated December 4, 2013 presented the results of the experience study. The actuarial assumptions represent estimates of future experience. For the purpose of analyzing rates of post retirement mortality, we used the results of the 2011 actuarial experience study conducted for the Oklahoma Public Employees Retirement System (OPERS) which is the largest, comparable public employee retirement system in the state of Oklahoma.

ACTUARIAL ASSUMPTIONS

Investment Return (net of expenses)

The rate of investment return assumed in the valuation was 7.40% per year, compounded annually net of investment and administrative expenses. The assumed real rate of return over wage inflation is 3.65% per year.

Wage Inflation

The wage inflation rate assumed in this valuation was 3.75% per year. The wage inflation rate is defined to be the portion of total pay increases for an individual that are due to macroeconomic forces including productivity, price inflation, and labor market conditions. The wage inflation rate does not include pay changes rated to individual merit and seniority effects.

Salary Increase Rates

These assumptions are used to project current pays to those which will determine average final compensation.

Sample Years of Service	Annual Rate of Merit and Longevity
1	3.50 %
2	3.50
3	3.50
4	3.50
5	3.50
6	3.50
7	3.50
8	3.50
9	3.50
10	3.50
11	3.50
12	3.50
13	3.50
14	3.00
15+	0.00

The active member population is assumed to remain constant. For purposes of financing the unfunded liabilities, total payroll is assumed to grow at a rate of 3.75% per year.

Price Inflation

The assumed rate of price inflation used in this valuation was 2.75% per year.

Mortality rates are used to measure the probabilities of a member dying before retirement and the probability of each benefit payment being made. The RP 2000 mortality table projected to 2010 was used in this valuation of the System. This table was used by the Oklahoma Public Employees Retirement System (OPERS) at the time of the last System experience study. Sample statistics are shown below. This table was first used in the December, 31, 2013 valuation.

Sample Ages	Value at Retirement of $1 Monthly for Life		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	$145.07	$147.77	31.81	34.12
55	137.01	140.54	27.13	29.40
60	126.76	131.37	22.62	24.85
65	114.46	120.37	18.40	20.57
70	100.44	107.75	14.56	16.65
75	84.54	93.62	11.08	13.11
80	67.75	78.15	8.09	9.96

Rates of retirement are used to measure the probabilities of an eligible member retiring during the next year, and are summarized below. These rates were first used for the December 31, 2013 valuation.

Age of Member	Percent of Eligible Members Retiring During Next Year	Years of Service	Percent Retiring
55	6%	25	15%
56	6	26	10
57	6	27	10
58	6	28	10
59	6	29	10
60	6	30	10
61	6	31	10
62	6	32	10
63	6	33	10
64	6	34	10
65	40	35	10
66	25	36	10
67	25	37	10
68	30	38	10
69	40	39	10
70	100	40	20
		41	10
		42	20
		43	10
		44	10
		45	100

The service based retirement rates were applied to those members first eligible to retire under "25 and out". The age based retirement rates were applied to members retiring under ‘65/5’ or the Plan's early retirement condition. The probability of retiring at age 70 was assumed to be 100% regardless of service.

Rates of Separation from Active Membership

This assumption measures the probabilities of a member terminating employment. The rates do not apply to members who are eligible to retire.

Sample Ages	Years of Service	% of Active Members Separating within Next Year
ALL	0	25.00%
	1	17.00
	2	12.00
	3	8.00
	4	6.00
25	5 & Over	7.00
30		6.00
35		4.75
40		3.50
45		2.40
50		1.50
55		1.00
60		1.00

Rates of Disability

This assumption measures the probabilities of a member becoming disabled.

Age of Member	% of Active Members During Next Year	
	Males	Females
25	0.08%	0.06%
30	0.09	0.07
35	0.11	0.09
40	0.14	0.13
45	0.21	0.19
50	0.62	0.57
55	0.97	0.86
60	1.10	0.96

Disabled life mortality is measured by the RP 2000 mortality table projected to 2010 at time of disability.

DEFINITIONS OF TECHNICAL TERMS

Actuarial Accrued Liability. The difference between the actuarial present value of System benefits and the actuarial value of future normal costs. Also referred to as "accrued liability" or "actuarial liability."

Actuarial Assumptions. Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Accrued Service. Service credited under the system which was rendered before the date of the actuarial valuation.

Actuarial Equivalent. A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of Retirement System benefits between future normal cost and actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Gain (Loss). The difference between actual experience and actuarial assumption anticipated experience during the period between two actuarial valuation dates.

Actuarial Present Value. The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payment.

Amortization. Paying off an interest-discounted amount with periodic payments of interest and principal -- as opposed to paying off with lump sum payment.

DEFINITIONS OF TECHNICAL TERMS

Normal Cost. The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.

Unfunded Actuarial Accrued Liability. The difference between actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded actuarial liability" or "unfunded accrued liability."

The existence of an unfunded actuarial accrued liability is not in itself bad, any more than a mortgage on a house is bad. The unfunded actuarial accrued liability does not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liability and the trend in its amount (after due allowance for devaluation of the dollar).

SUMMARY OF ASSUMPTIONS USED
DECEMBER 31, 2016
MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

Marriage Assumption:	80% of the population is assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Pay Increase Timing:	Beginning of year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
Decrement Timing:	All decrements were assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Normal Form of Benefit:	The assumed normal form of benefit is the straight life form.
Expenses:	Assumed investment return is net of administrative and investment expenses.
Non-forfeiture Assumption:	All vested terminated members who terminate close to retirement were assumed to elect a deferred retirement while those terminating with less service were assumed to elect a refund of their contributions in lieu of deferred retirement benefits.

SECTION D

SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION
SCHEDULE OF FUNDING PROGRESS
(DOLLAR AMOUNTS IN THOUSANDS)

Actuarial Valuation Date December 31,	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Active Member Covered Payroll (c)	UAAL as a Percentage of Active Member Covered Payroll ((b-a)/c)
2006	$476,913	$457,547	$(19,366)	104.2 %	$ 95,504	(20.3) %
2007	529,876	488,827	(41,049)	108.4	99,574	(41.2)
2008	528,664	519,234	(9,430)	101.8	105,566	(8.9)
2009	529,137	556,427	27,290	95.1	110,408	24.7
2010	524,731	566,834	42,103	92.6	102,915	40.9
2011 *#	514,499	533,719	19,220	96.4	109,293	17.6
2012	547,686	553,588	5,902	98.9	114,933	5.1
2013 #	589,527	581,866	(7,661)	101.3	119,457	(6.4)
2014	628,686	607,295	(21,391)	103.5	124,142	(17.2)
2015 #	665,077	633,985	(31,092)	104.9	128,499	(24.2)
2016	692,359	661,212	(31,147)	104.7	127,017	(24.5)

 # Changes in methods and assumptions.
** Plan provision changes.*

Analysis of the dollar amounts of the actuarial value of assets, actuarial accrued liability, or actuarial accrued liability in isolation can be misleading. Expressing the actuarial value of assets as a percentage of the actuarial accrued liability provides one indication of the System's funded status on a going-concern basis. Analysis of this percentage over time indicates whether the System is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan. The unfunded actuarial accrued liability and annual covered payroll are both affected by inflation. Expressing the unfunded actuarial accrued liability as a percentage of covered payroll approximately adjusts for the effects of inflation and aids analysis of the progress being made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the plan.

SUPPLEMENTARY INFORMATION

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date	December 31, 2016
Actuarial Cost Method	Individual Entry Age
Amortization Method	Level Percent of payroll
Amortization Period	25 years closed
Asset Valuation Method	4-year smoothed market
Actuarial Assumptions:	
Investment Rate of Return*	7.40%
Projected Salary Increases*	3.75% - 7.25%
*Includes Wage Inflation	3.75%
Cost-of-Living Adjustments	Up to 2.0% per year

SECTION E

RETIREMENT SYSTEM EXPERIENCE

ACTUAL VS EXPECTED

DERIVATION OF EXPERIENCE GAIN (LOSS)
CALENDAR YEARS 2012 - 2016

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is hoped that gains and losses will cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below, along with a year by year historic comparison.

	Amounts Shown are Expressed in Thousands of Dollars				
	2016	**2015**	**2014**	**2013**	**2012**
(1) UAAL* at start of year	$ (31,092)	$ (21,391)	$ (7,661)	$ 5,902	$ 79,423
(2) Normal cost	16,017	15,767	15,170	14,550	15,252
(3) Actual member and employer contributions	14,496	15,812	15,608	17,827	17,292
(4) Interest accrual on (1), (2) and (3)	(2,245)	(1,606)	(591)	320	6,272
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	(31,816)	(23,042)	(8,690)	2,945	83,655
(6) Increase due to benefit/assumption changes	0	7,149	0	3,568	(65,947)
(7) Increase due to revised actuarial methods	0	0	0	0	0
(8) Expected UAAL after changes: (5) + (6) + (7)	(31,816)	(15,893)	(8,690)	6,513	17,708
(9) Actual UAAL at end of year	(31,147)	(31,092)	(21,391)	(7,661)	5,902
(10) Gain (loss): (8) - (9)	(669)	15,199	12,701	14,174	11,806

* *Unfunded actuarial accrued liability (UAAL).*

Note: Benefit changes reflected in the 2012 gain/loss but adopted retroactively for the 2011 valuation.

SERVICE RETIREMENTS DURING THE INDICATED PLAN YEARS

Age Group	Number Retiring in the Indicated Year 2016	2015*	2014
40-44		1	
45-49	5	1	5
50-54	5	11	2
55-59	20	17	14
60	4	1	5
61	5	3	5
62	7	9	10
63	12	9	7
64	2	10	4
65	6	5	7
66	4	6	2
67	3	3	5
68	4		3
69	1	1	
70 & Over	7	2	5
Total	**85**	**79**	**74**
Expected	97.6	99.6	97.9

** Excludes members who retired and became deceased in the same year.*

The chart above shows actual versus expected retirements from City employment and does not include retirements from deferred status, death-in-service, or disability retirements.

NON-VESTED WITHDRAWALS
FROM ACTIVE MEMBERSHIP
DURING THE INDICATED PLAN YEARS

Age Groups	Years of Service	Number Terminating During the Indicated Year		
		2016	**2015**	**2014**
	0	60	43	41
	1	19	23	19
	2	17	11	17
	3	12	17	7
	4	10	4	3
	Sub-Total	118	98	87
Under 30	5 & Over	0	2	2
30-34		7	4	2
35-39		2	4	8
40-44		3	8	2
45-49		3	6	3
50-54		4	3	6
55-59		2	2	5
60 & Over		3	3	3
Sub-Total		24	32	31
Total		**142**	**130**	**118**
Expected No.		146.1	128.2	126.4

NUMBER ADDED TO AND REMOVED FROM ACTIVE MEMBERSHIP

ACTUAL & EXPECTED

Valuation Date	Number Added During Year		Terminations During Year								Active Members End of Year
			Retirement		Disabled		Died-In Service		Other Withdrawal		
December 31	A	E	A	E	A	E	A	E	A	E	
2002	135	215	54	89.1	5	3.1	9	3.7	147	172.2	2,374
2003	120	213	42	87.6	2	3.2	7	3.7	153	146.7	2,290
2004	207	201	62	98.7	1	3.0	3	3.9	129	119.9	2,302
2005	200	190	57	100.2	3	3.1	6	4.1	124	129.6	2,312
2006	238	197	63	88.8	3	3.1	2	3.8	129	131.4	2,353
2007	206	179	64	93.4	1	3.0	5	3.9	109	148.9	2,380
2008	220	178	68	94.7	0	2.8	0	4.0	110	149.5	2,422
2009	138	180	67	106.8	1	2.6	2	4.0	110	159.2	2,380
2010	137	213	91	106.7	4	2.5	4	4.1	114	132.6	2,304
2011	257	163	48	111.6	1	2.4	3	4.2	111	124.0	2,398
2012	242	181	45	116.1	1	2.5	3	4.4	132	146.0	2,459
2013	221	193	66	130.0	2	2.4	4	4.6	121	154.9	2,487
2014	223	210	74	97.9	3	2.4	2	3.2	131	136.0	2,500
2015	312	226	79	99.6	2	2.4	2	3.3	143	137.6	2,586
2016	172	252	85	97.6	1	2.5	1	3.3	165	155.2	2,506
2012-2016	1,170	1,062	349	541.2	9	12.2	12	18.8	692	729.7	

A: Actual experience
E: Expected experience based on actuarial assumptions