

Illinois Municipal Retirement Fund

Gain/Loss Analysis of Financial Experience Among
Active Members During the Period

January 1, 2017 to December 31, 2017



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Report of IMRF Gain/Loss Analysis

During Calendar Year 2017

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March 22, 2018

Board of Trustees
Illinois Municipal Retirement Fund
Oak Brook, Illinois 60521

Ladies and Gentlemen:

Submitted in this report are the results of the annual gain and loss analysis of financial experience among the active members of the Illinois Municipal Retirement Fund (IMRF) covering the period from **January 1, 2017 to December 31, 2017.**

This is one of several documents comprising the full actuarial report. For additional information please see the Annual Actuarial Valuation report dated March 16, 2018.

The valuation was based upon information, furnished by IMRF staff, concerning Retirement Fund benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by IMRF Staff. GRS is not responsible for unauthorized use of this report.

The valuations are based upon current plan provisions related to Regular Members, Sheriff's Law Enforcement Personnel (SLEP), and Elected County Officials (ECO) employment.

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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of IMRF as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

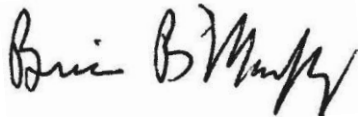
Brian B. Murphy, Mark Buis, and Francois Pieterse are Members of the American Academy of Actuaries (MAAA). These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

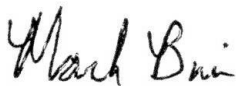
Gabriel, Roeder, Smith & Company will be pleased to review this valuation and report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY



Brian B. Murphy, FSA EA, FCA, MAAA



Mark Buis, FSA, EA, FCA, MAAA



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BBM/MB/FP:sc



Comments

Purpose of Gain/Loss Analysis. Regular actuarial valuations give valuable information about the composite change in unfunded actuarial accrued liabilities -- whether or not the liabilities are increasing or decreasing and by how much.

Valuations do not show the portion of the change attributable to each risk area within the retirement system financial mechanism: the rate of investment return which plan assets will earn; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of pay increases; and the ages at actual retirement. In an actuarial valuation, assumptions must be made as to what these rates will be, for the next year and for decades in the future.

The objective of a gain and loss analysis is to determine the portion of the change in actuarial condition (unfunded actuarial accrued liabilities) attributable to each risk area.

The fact that actual experience differs from assumed experience is to be expected -- ***the future cannot be predicted with precision.*** The economic risk areas (particularly investment return and pay increases) are volatile. Inflation directly affects economic risk areas, and inflation seems to defy reliable prediction.

Changes in the assumed experience for a risk area should be made when the differences between assumed and actual experience have been observed to be sizable and persistent. A gain and loss analysis covering a relatively short period may or may not be indicative of ***long-term trends, which are the basis of financial assumptions.***

Comments

Data Used. The 2017 gain/loss analysis is based on the active member population as reported for use in preparing the December 31, 2016 and December 31, 2017 regular annual actuarial valuations. Please note however, that counts shown in this report may not match the December 31, 2017 valuation or the December 31, 2016 gain/loss report since data records for members who have more than one record have been combined. The 2016 reported active member data was matched with the 2017 reported active/inactive member data and the 2017 reported data for retirees and beneficiaries. This matching shows the movement of persons from active member status to various inactive status categories (e.g., retirement, death, disability, etc.). A reconciliation of the population is shown below:

	Active Population Reconciliation					
	Actual					Expected
	Regular	SLEP	ECO		Total	
			Regular	SLEP		
Beginning of Year Census	169,831	4,142	153	12	174,138	
+ New People	22,216	283	6	0	22,505	
- Normal Retirement	4,697	155	22	1	4,875	5,227
- Early Retirement	1,015	0	0	0	1,015	1,288
- Vested Deferred Retirements	2,182	32	9	0	2,223	1,646
- Deaths	151	4	1	0	156	485
- Disabilities	313	1	0	0	314	56
- Other Terminations	13,102	114	3	0	13,219	12,596
End of Year Census	170,587	4,119	124	11	174,841	

The expected number of disabilities is based on the assumed rates of disability for permanent disability. The actual number of disabilities shown above is comprised of both temporary and permanent disability cases with temporary cases making up the majority.

The retirement system had **a net experience gain/(loss) of \$1,624 million** during the 2017 observation year, which is 3.93% of the beginning accrued liabilities. During the 2017 observation year, IMRF experienced a return on the Market Value of Assets of 15.7%. The gain of \$475 million related to investment return and described on the following page is based on the Actuarial Value of Assets (AVA), which is a five-year smoothed market value. In this method, a portion of the current years' market value gain is combined with portions of the gains or losses from the prior four years to arrive at the AVA. See page 7 for a full description of this method.

Changes in Unfunded Actuarial Accrued Liabilities During Calendar Year 2017

The schedule below estimates the total gain or loss on Retirement Fund activities for the year as the difference between Expected and Actual Unfunded Liability.

	Unfunded Liability Development During	
	2017	2016
Unfunded Liability January 1	\$4,585,312,875	\$4,573,446,421
(Assumed Payments)	(302,834,136)	(295,381,436)
Assumed Interest	332,679,056	332,065,180
Expected Unfunded Liability December 31	4,615,157,795	4,610,130,165
Change Due to Experience Study	(1,094,614,950)	0
Change Due to Benefit Changes	0	0
Change Due to Investment Experience	(475,485,083)	109,908,168
Change Due to Demographic and Other Sources	(53,377,418)	(134,725,458)
Actual Unfunded Liability December 31	2,991,680,344	4,585,312,875
Gain (Loss) for the Year	\$1,623,477,451	\$ 24,817,290

The following schedule reconciles the employer contribution rate from last year to this year.

	Regular	SLEP	ECO	Total
Prior Year	11.24 %	21.49 %	82.72 %	11.78 %
Experience Study	(1.62)%	(0.13)%	(3.35)%	(1.56)%
Tier 2 Structure	(0.12)%	(0.15)%	0.00 %	(0.12)%
Investment Return	(0.40)%	(0.63)%	(2.72)%	(0.40)%
Pay Increases	(0.10)%	0.23 %	(0.27)%	(0.11)%
Demographic	0.01 %	0.08 %	(0.26)%	0.02 %
Payroll Growth	0.05 %	0.14 %	(7.91)%	0.06 %
Death and Disability Rate Change	(0.02)%	(0.02)%	(0.03)%	(0.02)%
Other	0.02 %	(0.51)%	(1.75)%	(0.03)%
Current Year	9.06 %	20.50 %	66.43 %	9.62 %

The next page shows the breakdown of the total gain or loss by source. Risk areas related to assumptions include economic risks and demographic risks. Economic risks relate to pay increases and investment return. Demographic risks relate to rates of retirement, death, disability, and other terminations. Actual number counts for each decrement are shown on pages 16 to 35. It is important to note that liability weighting was used to develop assumptions for certain decrements (such as retirement and age-based withdrawal) and therefore looking at number counts alone is not always the best indicator of plan experience.

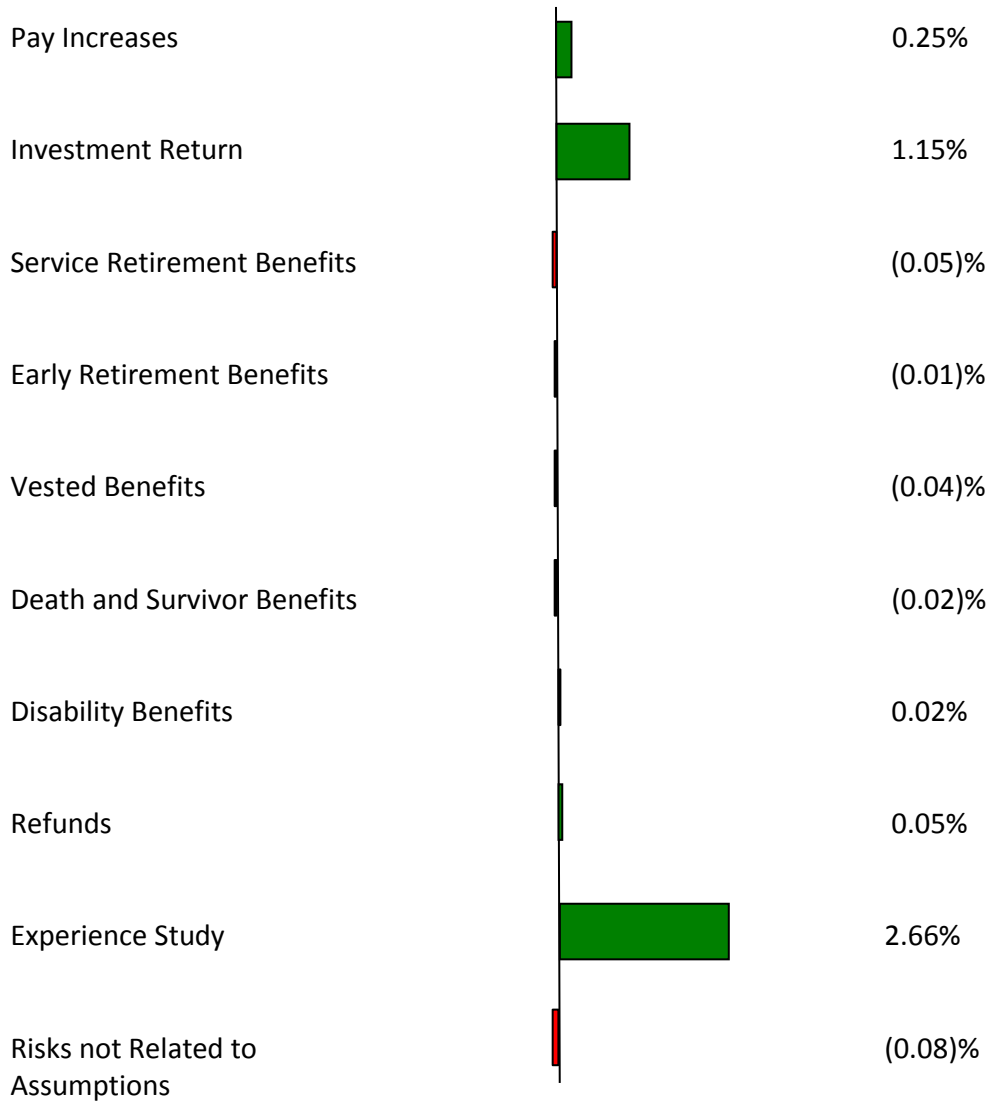
Changes in Active Member Accrued Liabilities Gains & Losses by Risk Area During Calendar Year 2017

Type of Risk Area	Gain (Loss) in Period			Percent of Liabilities
	Regular	SLEP	Totals	
Millions of \$				
Risks Related to Assumptions				
Economic Risk Areas				
<i>Pay Increases</i>	\$115.4	\$(11.1)	\$ 104.3	0.25%
<i>Investment Return</i>			475.5	1.15%
Demographic Risk Areas				
<i>Service Retirements</i>	(17.1)	(4.7)	(21.8)	(0.05)%
<i>Early Retirements</i>	(2.6)	0.0	(2.6)	(0.01)%
<i>Vested Deferred Retirements</i>	(16.2)	(1.6)	(17.8)	(0.04)%
<i>Death and Survivor Benefits</i>	(7.8)	(0.4)	(8.2)	(0.02)%
<i>Disability Benefits</i>	10.0	(0.3)	9.7	0.02%
<i>Terminated with Refund</i>	19.5	2.9	22.4	0.05%
Experience Study			1,094.6	2.66%
Risks not Related to Assumptions*			(32.6)	(0.08)%
Total Gain (or Loss) During Period			1,623.5	3.93%
Beginning of Year Accrued Liabilities			\$41,358.7	100.0%

* This is primarily due to rehires of former employees and actual reserve transfers for retirees being higher than the estimated reserve transfers. This may be due to higher final average pay than expected, higher service at retirement than expected, miscellaneous effects of the ERI program or other data adjustments that are made when a final benefit calculation is performed. There may also be a small gain or loss due to retiree mortality which was included in this amount.

Gain/Loss Experience During Calendar Year 2017

Gain/Loss Experience Expressed as a % of Beginning of Year Liabilities



Experience Gains & Losses by Risk Area Comparative Statement

Experience Period	Pay Increases	Investment Return	Service Retirement	Early Retirement	Vested Deferred Retirement	Death and Survivor Benefits	Disability Benefits	Terminated with Refund	Experience Study	Other	Total Gain (Loss)	
											\$	Percent of Liabilities
1998	\$ (69.9)	\$ 515.7	\$ 37.8	\$(8.7)	\$ 37.8	\$7.7	\$ 5.7	\$(10.5)		\$ (197.0)	\$ 318.6	2.9 %
1999 ¹	5.5	962.1	(6.8)	(5.1)	(14.6)	0.6	6.4	(21.1)		(168.1)	758.9	6.4 %
2000	12.2	642.5	0.8	(2.8)	(8.7)	1.8	9.8	(22.4)		(89.2)	544.0	4.2 %
2001	(29.5)	69.4	(4.9)	(1.0)	(20.3)	2.9	10.0	11.4		1.4	39.4	0.3 %
2002 ¹	19.5	(611.8)	(9.9)	(2.0)	(31.0)	4.3	6.9	2.3		(66.7)	(688.4)	(4.5)%
2003	36.8	(404.6)	(18.4)	(5.4)	(28.0)	2.3	5.9	10.0		(250.0)	(651.4)	(3.9)%
2004	(0.3)	(478.5)	(14.7)	(5.3)	(27.5)	3.4	7.3	15.8		(183.0)	(682.6)	(3.8)%
2005 ¹	130.0	23.8	(10.4)	(5.0)	(28.3)	1.9	12.0	19.3		(111.2)	32.1	0.2 %
2006	23.5	262.2	(8.6)	(3.4)	(32.7)	2.1	9.4	11.1		(211.7)	51.9	0.3 %
2007	(15.4)	305.8	(8.4)	(2.6)	(35.3)	4.1	10.2	23.2		(170.5)	111.1	0.6 %
2008 ¹	8.2	(3,331.5)	2.4	(2.1)	(40.8)	1.8	11.4	9.1		(40.5)	(3,382.0)	(12.6)%
2009	70.2	(343.2)	11.6	(0.5)	(38.3)	3.5	12.9	(11.8)		(53.5)	(349.1)	(1.4)%
2010	359.6	(90.5)	(0.2)	0.0	(32.3)	3.3	7.3	(0.3)		(442.1) ²	(195.2)	(0.7)%
2011 ¹	238.9	(164.3)	(22.9)	(5.7)	(25.9)	7.3	8.2	19.9	\$ (181.1)	(163.3)	(288.9)	(1.0)%
2012	230.2	71.0	2.0	(3.0)	(24.7)	6.5	20.8	23.8		(89.0)	237.6	0.8 %
2013	141.5	811.5	(11.6)	(2.8)	(22.7)	3.2	15.7	45.1		(74.0)	905.9	2.8 %
2014 ¹	64.2	767.6	(19.3)	(4.9)	(19.7)	(2.2)	17.2	37.9	(1,309.7)	34.9	(434.0)	(1.3)%
2015	22.9	313.2	(28.5)	(4.7)	(16.8)	(3.4)	15.8	33.0		(100.6)	230.9	0.6 %
2016	312.7	(109.9)	(20.2)	(2.6)	(14.1)	(3.3)	12.0	35.7		(185.5)	24.8	0.1 %
2017 ¹	104.3	475.5	(21.8)	(2.6)	(17.8)	(8.2)	9.7	22.4	1,094.6	(32.6)	1,623.5	3.9 %

1 Changes in assumptions due to the Experience Study.

2 Includes one-time data changes of approximately \$250 million.

3 Includes Experience Study Changes.

Development of Funding Value of Retirement System Assets Gain (Loss) from Investment Return During the Calendar Year 2017

Year Ended December 31	2016	2017	2018	2019	2020	2021
A. Funding Value Beginning of Year	\$34,913,127,469	\$36,773,397,527				
B. Market Value End of Year	36,446,780,265	41,312,666,221				
C. Market Value Beginning of Year	34,461,065,824	36,446,780,265				
D. Non-Investment/Administrative Net Cash Flow	(624,873,575)	(789,479,627)				
E. Investment Return						
E1. Market Total: B-C-D	2,610,588,016	5,655,365,583				
E2. Assumed Rate of Return	7.50%	7.50%				
E3. Assumed Amount of Return	2,595,051,801	2,728,399,329	-----Scheduled-----			
E4. Return Subject to Phase-in: E1-E3	15,536,215	2,926,966,254				
F. Phased-In Recognition of Investment Return						
F1. Current Year: 0.20xE4	3,107,243	585,393,251	Unknown	Unknown	Unknown	Unknown
F2. First Prior Year	(113,015,411)	3,107,243	\$531,215,977	Unknown	Unknown	Unknown
F3. Second Prior Year	-	(113,015,411)	-	\$531,215,977	Unknown	Unknown
F4. Third Prior Year	-	-	-	-	\$531,215,977	Unknown
F5. Fourth Prior Year	-	-	-	-	-	\$531,215,978
F6. Funding Corridor Adjustment	-	-				
F7. Total Scheduled Phase-in of Gain/(Loss)	(109,908,168)	475,485,083	531,215,977	531,215,977	531,215,977	531,215,978
G. Acceptable Phase-In of Investment Return						
G1. Projected Funding Value without Phase-In: A+D+E3	36,883,305,695	38,712,317,229				
G2. Limit on Phase-In: B-G1	(436,525,430)	2,600,348,992				
G3. Acceptable Phase-In Amount	(109,908,168)	475,485,083				
H. Funding Value End of Year: A+D+E3+G3	36,773,397,527	39,187,802,312				
I. Difference Between Market and Funding Value	(326,617,262)	2,124,863,909	1,593,647,932	1,062,431,955	531,215,978	-
J. Recognized Rate of Return	7.2 %	8.8 %				
K. Market Rate of Return	7.6 %	15.7 %				
L. Ratio of Funding Value to Market Value	100.9 %	94.9 %				

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (line E4) are phased-in over a closed 5-year period subject to a 20% corridor. The acceptable phase-in amount (Item G3) is the minimum of Items F7 and G2, if G2 is positive. If G2 is negative, the acceptable phase-in amount is the greater of Items F7 and G2.

Regular Employees in Valuation by Age and Years of Service as of December 31, 2016

Age	Years of Service to Valuation Date								Total Number
	Men				Women				
	0-7	8-19	20-34	35 Plus	0-7	8-19	20-34	35 Plus	
24 & Under	2,453	1			3,148				5,602
25- 29	4,784	194			6,481	161			11,620
30- 34	4,058	1,630			5,936	1,478			13,102
35- 39	2,968	2,928	24		5,967	3,205	26		15,118
40- 44	2,392	3,092	439	2	6,535	3,933	345	1	16,739
45- 49	2,318	2,954	1,616	10	7,433	5,881	1,347	1	21,560
50	438	605	452	3	1,347	1,458	351		4,654
51	457	548	490	6	1,352	1,624	403	2	4,882
52	518	611	554	6	1,268	1,819	501		5,277
53	510	663	587	16	1,243	1,926	538	4	5,487
54	572	659	667	46	1,164	2,022	662	35	5,827
55	560	663	664	72	1,117	2,089	637	58	5,860
56	571	621	579	82	1,060	2,085	722	46	5,766
57	540	615	556	82	973	1,999	767	66	5,598
58	529	602	481	108	960	1,982	762	78	5,502
59	557	604	475	122	792	1,896	855	64	5,365
60	558	625	434	131	781	1,759	892	68	5,248
61	527	503	382	102	669	1,494	829	77	4,583
62	522	508	332	93	592	1,238	779	70	4,134
63	444	466	241	69	449	1,036	677	43	3,425
64	402	423	237	66	388	921	577	40	3,054
65	326	365	174	46	326	739	506	46	2,528
66	280	302	113	34	250	478	329	32	1,818
67	229	238	77	25	179	361	231	31	1,371
68	208	172	57	16	186	285	187	20	1,131
69	173	158	40	11	144	209	145	13	893
70 & Over	748	842	208	45	498	759	484	103	3,687
Totals	28,642	21,592	9,879	1,193	51,238	42,837	13,552	898	169,831

Figures on this page may not always match corresponding figures from the regular valuation due to differences in tabulation methods.

ECO Regular Employees in Valuation by Age and Years of Service as of December 31, 2016

Age	Years of Service to Valuation Date								Total Number
	Men				Women				
	0-7	8-19	20-34	35 Plus	0-7	8-19	20-34	35 Plus	
24 & Under									
25- 29									
30- 34	1								1
35- 39		5			1				6
40- 44	1	4	1			1			7
45- 49	1	7	2		1	5			16
50		1	2						3
51		2	1				2		5
52						4			4
53	2	1	1	1			2		7
54	1	4	1			2	1		9
55	1	4		1		1	2	1	10
56	1				1				2
57	1	1	2			1			5
58	1	1			1	2			5
59		3	2			4		1	10
60		5	2		1	3	2		13
61		3	2			1		1	7
62	2	4		1	1	1	1		10
63		2	2					1	5
64	2		3		1	1	1		8
65		1			1				2
66		2				1	1		4
67	2					1			3
68		1	1						2
69		2							2
70 & Over	1	2	1			2		1	7
Totals	17	55	23	3	8	32	10	5	153

Figures on this page may not always match corresponding figures from the regular valuation due to differences in tabulation methods.

SLEP Employees in Valuation by Age and Years of Service as of December 31, 2016

Age	Years of Service to Valuation Date								Total Number
	Men				Women				
	0-7	8-19	20-34	35 Plus	0-7	8-19	20-34	35 Plus	
24 & Under	65				12				77
25- 29	318	2			53				373
30- 34	346	221			42	39			648
35- 39	152	439	2		33	66			692
40- 44	84	416	80		19	81	11		691
45- 49	54	328	322		9	43	46		802
50	8	37	87		3	5	5		145
51	7	26	39		3	5	1		81
52	10	26	36			11	9		92
53	4	22	33			8	7		74
54	8	18	23	1		9	4		63
55	4	20	27			5	2		58
56	9	13	16	2		11	6		57
57	6	16	16			4	4		46
58	3	18	16	1	1	2	4	1	46
59	8	12	8			1			29
60	5	7	8	2		3	2	1	28
61	5	15	12	1		5	1		39
62	2	11	4	1	1	1			20
63	5	7	4	1		3	1		21
64	3	12	4	2		1			22
65	1	2	4						7
66		3				1			4
67	2	1	1			1	1		6
68	2	3	3						8
69	2		1						3
70 & Over	2	5	2	1					10
Totals	1,115	1,680	748	12	176	305	104	2	4,142

Figures on this page may not always match corresponding figures from the regular valuation due to differences in tabulation methods.

ECO SLEP Employees in Valuation by Age and Years of Service as of December 31, 2016

Age	Years of Service to Valuation Date								Total Number
	Men				Women				
	0-7	8-19	20-34	35 Plus	0-7	8-19	20-34	35 Plus	
24 & Under									
25- 29									
30- 34									
35- 39									
40- 44									
45- 49	2	1							3
50		1							1
51									
52			1						1
53									
54									
55		1							1
56									
57									
58									
59									
60	1	2							3
61									
62									
63									
64									
65									
66			1	2					3
67									
68									
69									
70 & Over									
Totals	3	5	2	2					12

Figures on this page may not always match corresponding figures from the regular valuation due to differences in tabulation methods.

Regular Employees in Valuation by Age and Years of Service as of December 31, 2017

Age	Years of Service to Valuation Date								Total Number
	Men				Women				
	0-7	8-19	20-34	35 Plus	0-7	8-19	20-34	35 Plus	
24 & Under	2,463				3,245				5,708
25- 29	4,984	179			6,801	116			12,080
30- 34	4,128	1,426			6,295	1,314			13,163
35- 39	3,161	2,924	21		6,368	3,131	19		15,624
40- 44	2,397	3,059	488		6,903	3,872	354		17,073
45- 49	2,342	2,802	1,591	9	7,476	5,462	1,315	1	20,998
50	434	542	436	5	1,409	1,373	427	1	4,627
51	477	589	486	3	1,314	1,487	420		4,776
52	475	538	516	9	1,369	1,623	461	3	4,994
53	534	580	588	12	1,261	1,793	568	5	5,341
54	505	650	595	29	1,238	1,850	628	14	5,509
55	571	639	655	60	1,167	1,933	733	48	5,806
56	558	636	611	72	1,101	1,964	673	52	5,667
57	572	605	561	90	1,056	1,957	796	49	5,686
58	544	591	522	91	949	1,849	843	79	5,468
59	528	572	467	98	951	1,828	815	75	5,334
60	547	570	444	118	792	1,711	907	53	5,142
61	537	585	402	112	755	1,587	854	73	4,905
62	474	466	328	95	647	1,313	816	71	4,210
63	475	442	278	67	546	1,006	713	66	3,593
64	406	426	222	55	407	890	634	37	3,077
65	366	393	202	54	347	751	525	40	2,678
66	294	276	121	25	267	523	362	36	1,904
67	264	234	78	29	221	321	242	23	1,412
68	208	195	67	23	145	283	186	20	1,127
69	182	142	49	15	167	215	157	13	940
70 & Over	808	801	197	37	560	775	483	84	3,745
Totals	29,234	20,862	9,925	1,108	53,757	40,927	13,931	843	170,587

Figures on this page may not always match corresponding figures from the regular valuation due to differences in tabulation methods.

ECO Regular Employees in Valuation by Age and Years of Service as of December 31, 2017

Age	Years of Service to Valuation Date								Total Number
	Men				Women				
	0-7	8-19	20-34	35 Plus	0-7	8-19	20-34	35 Plus	
24 & Under									
25- 29									
30- 34	1								1
35- 39		2							2
40- 44	1	6			1	1			9
45- 49	1	4	2		1	4			12
50		4							4
51		2	2			1			5
52		2	1			1			4
53						4			4
54	2	1	1				2		6
55	1	5	1			2	1		10
56	1	4				1	2	1	9
57	1				1				2
58	1	1	1			1			4
59		1			1	2			4
60		2	2			3		1	8
61		3	1		1	2	2		9
62		1	1			1		1	4
63	2	4		1		1			8
64		1	2						3
65		1	2			1	1		5
66		1							1
67		2				1	1		4
68	2					1			3
69									
70 & Over		2						1	3
Totals	13	49	16	1	5	27	9	4	124

Figures on this page may not always match corresponding figures from the regular valuation due to differences in tabulation methods.

SLEP Employees in Valuation by Age and Years of Service as of December 31, 2017

Age	Years of Service to Valuation Date								Total Number
	Men				Women				
	0-7	8-19	20-34	35 Plus	0-7	8-19	20-34	35 Plus	
24 & Under	68				13				81
25- 29	344	4			58				406
30- 34	324	196			42	41			603
35- 39	163	437	1		29	60			690
40- 44	101	394	81		13	75	14		678
45- 49	51	332	329		13	51	40		816
50	12	42	63		2	6	9		134
51	7	32	62		1	7	2		111
52	7	21	33		1	7			69
53	10	25	24			9	6		74
54	4	19	28			5	6		62
55	7	15	19	2		7	5		55
56	2	18	19			5	2		46
57	10	13	10	2		9	4		48
58	7	16	15			4	3		45
59	3	14	11	1	1	2	4		36
60	8	10	6			1			25
61	6	6	6			3	2	1	24
62	3	13	12	2		4	1		35
63	2	10	4	1		1			18
64	4	7	2			1	2		16
65	3	11	2	2		1			19
66	1	2	3						6
67		3				1			4
68	2	1	1				1		5
69		3	1						4
70 & Over	1	6		2					9
Totals	1,150	1,650	732	12	173	300	101	1	4,119

Figures on this page may not always match corresponding figures from the regular valuation due to differences in tabulation methods.

ECO SLEP Employees in Valuation by Age and Years of Service as of December 31, 2017

Age	Years of Service to Valuation Date								Total Number
	Men				Women				
	0-7	8-19	20-34	35 Plus	0-7	8-19	20-34	35 Plus	
24 & Under									
25- 29									
30- 34									
35- 39									
40- 44									
45- 49									
50	1	1							2
51		1							1
52									
53			1						1
54									
55									
56		1							1
57									
58									
59									
60									
61	1	2							3
62									
63									
64									
65									
66									
67			1	2					3
68									
69									
70 & Over									
Totals	2	5	2	2					11

Figures on this page may not always match corresponding figures from the regular valuation due to differences in tabulation methods.

RETIREMENT EXPERIENCE

Active Regular Group Members Who Became Age & Service Retirees During Calendar Year 2017 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 55	3	3
55	27	89
56	20	107
57	16	99
58	21	120
59	35	142
60	118	1,306
61	109	1,119
62	196	1,037
63	144	896
64	111	784
65	158	741
66	185	554
67	97	407
68	70	316
69	51	231
70	59	231
71	48	186
72	21	123
73	28	131
74	26	125
75 & Up	144	517
Total (55 & Up)	1,684	9,261
Average Rate:	0.1818	

Female		
Age	Retirements	Exposure
Under 55	1	1
55	21	74
56	12	61
57	10	68
58	15	98
59	22	87
60	271	2,903
61	229	2,624
62	354	2,364
63	276	2,033
64	216	1,666
65	377	1,477
66	359	1,151
67	214	706
68	124	579
69	116	456
70	107	388
71	54	261
72	49	183
73	31	143
74	32	153
75 & Up	120	474
Total (55 & Up)	3,009	17,949
Average Rate:	0.1676	

Active Regular Group Members Who Became Early Service Retirees During Calendar Year 2017

Male		
Age	Retirements	Exposure
55	76	1,340
56	64	1,306
57	56	1,239
58	60	1,079
59	58	1,103
Total	314	6,067
Average Rate:	0.0518	

Female		
Age	Retirements	Exposure
55	138	2,756
56	152	2,892
57	127	2,892
58	146	2,861
59	138	2,761
Total	701	14,162
Average Rate:	0.0495	

Active SLEP Group Members Who Became Age & Service Retirees During Calendar Year 2017 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 50	-	-
50	23	70
51	18	74
52	12	40
53	11	37
54	8	34
55	6	20
56	7	24
57	7	20
58	6	18
59	6	15
60	4	19
61	4	21
62	1	23
63	2	17
64	5	14
65	-	11
66	1	5
67	-	4
68	1	3
69	3	5
70	1	4
71	2	1
72	-	1
73	-	1
74	-	-
75 & Up	-	2
Total (50 & Up)	128	483
Average Rate:	0.2650	

Female		
Age	Retirements	Exposure
Under 50	-	-
50	5	11
51	4	6
52	3	6
53	5	10
54	1	7
55	-	5
56	3	7
57	2	5
58	1	5
59	-	1
60	-	1
61	-	9
62	1	2
63	1	3
64	-	2
65	-	1
66	-	-
67	1	2
68	-	1
69	-	-
70	-	-
71	-	-
72	-	-
73	-	-
74	-	-
75 & Up	-	-
Total (50 & Up)	27	84
Average Rate:	0.3214	

**Active ECO Group Members Who Became Age & Service Retirees
During Calendar Year 2017
(Retirement with Benefit Beginning Immediately)**

Male		
Age	Retirements	Exposure
Under 55	-	-
55	-	4
56	-	3
57	-	-
58	1	3
59	1	5
60	1	5
61	4	6
62	-	4
63	-	6
64	2	4
65	-	3
66	-	-
67	-	2
68	1	2
69	-	1
70	1	1
71	1	1
72	-	-
73	-	-
74	1	1
75 & Up	1	2
Total (55 & Up)	14	53
Average Rate:	0.2642	

Female		
Age	Retirements	Exposure
Under 55	1	1
55	1	3
56	-	4
57	-	-
58	-	1
59	-	4
60	1	5
61	-	4
62	-	2
63	1	1
64	1	2
65	1	2
66	1	2
67	-	1
68	-	-
69	-	-
70	-	-
71	-	-
72	-	1
73	-	-
74	-	-
75 & Up	1	2
Total (55 & Up)	7	34
Average Rate:	0.2059	

Active ECO SLEP Group Members Who Became Age & Service Retirees During Calendar Year 2017 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 50	-	-
50	1	-
51	-	-
52	-	1
53	-	-
54	-	-
55	-	-
56	-	1
57	-	-
58	-	-
59	-	-
60	-	-
61	-	2
62	-	-
63	-	-
64	-	-
65	-	-
66	-	2
67	-	1
68	-	-
69	-	-
70	-	-
71	-	-
72	-	-
73	-	-
74	-	-
75 & Up	-	-
Total (50 & Up)	1	7
Average Rate:	0.1429	

Female		
Age	Retirements	Exposure
Under 50	-	-
50	-	-
51	-	-
52	-	-
53	-	-
54	-	-
55	-	-
56	-	-
57	-	-
58	-	-
59	-	-
60	-	-
61	-	-
62	-	-
63	-	-
64	-	-
65	-	-
66	-	-
67	-	-
68	-	-
69	-	-
70	-	-
71	-	-
72	-	-
73	-	-
74	-	-
75 & Up	-	-
Total (50 & Up)	-	-
Average Rate:	-	

DISABILITY EXPERIENCE

Regular Group Members Who Became Disability Retirees During Calendar Year 2017

Male		
Age	Disabilities*	Exposure
Under 20	-	77
20-24	-	1,953
25-29	5	4,887
30-34	2	5,607
35-39	7	5,937
40-44	12	5,887
45-49	19	6,779
50-54	24	8,120
55-59	36	9,173
60-64	26	7,403
65-69	9	3,441
70-74	1	1,329
75 and Over	1	713
Totals	142	61,306
Average Rate:	0.0023	

Female		
Age	Disabilities*	Exposure
Under 20	-	99
20-24	1	2,512
25-29	4	6,508
30-34	4	7,257
35-39	9	8,977
40-44	18	10,673
45-49	25	14,250
50-54	31	17,358
55-59	44	19,081
60-64	24	14,322
65-69	8	5,399
70-74	1	1,503
75 and Over	2	586
Totals	171	108,525
Average Rate:	0.0016	

** The numbers shown above may be overstated due to inclusion of temporary disability cases. Actual numbers may vary once the permanent cases have been determined.*

SLEP Group Members Who Became Disability Retirees During Calendar Year 2017

Male		
Age	Disabilities*	Exposure
Under 20	-	-
20-24	-	45
25-29	-	312
30-34	-	535
35-39	-	592
40-44	-	567
45-49	-	727
50-54	-	422
55-59	-	195
60-64	-	115
65-69	-	34
70-74	-	2
75 and Over	-	-
Totals	-	3,546
Average Rate:	-	

Female		
Age	Disabilities*	Exposure
Under 20	-	-
20-24	-	9
25-29	-	53
30-34	-	78
35-39	1	94
40-44	-	111
45-49	-	94
50-54	-	76
55-59	-	50
60-64	-	18
65-69	-	4
70-74	-	-
75 and Over	-	-
Totals	1	587
Average Rate:	0.0017	

** The numbers shown above may be overstated due to inclusion of temporary disability cases. Actual numbers may vary once the permanent cases have been determined.*

ECO Group Members Who Became Disability Retirees During Calendar Year 2017

Male		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	1
35-39	-	5
40-44	-	5
45-49	-	8
50-54	-	17
55-59	-	20
60-64	-	27
65-69	-	10
70-74	-	3
75 and Over	-	2
Totals	-	98
Average Rate:	-	

Female		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	2
45-49	-	6
50-54	-	9
55-59	-	13
60-64	-	16
65-69	-	6
70-74	-	1
75 and Over	-	2
Totals	-	55
Average Rate:	-	

ECO SLEP Members Who Became Disability Retirees During Calendar Year 2017

Male		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	5
55-59	-	1
60-64	-	3
65-69	-	3
70-74	-	-
75 and Over	-	-
Totals	-	12
Average Rate:	-	

Female		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	-
55-59	-	-
60-64	-	-
65-69	-	-
70-74	-	-
75 and Over	-	-
Totals	-	-
Average Rate:	-	

WITHDRAWAL EXPERIENCE

**Regular Group Members Who Left Active Status
During Calendar Year 2017
with Eight or More Years of Service**

Male		
Age	Withdrawals	Exposure
25-29	14	186
30-34	100	1,575
35-39	119	2,993
40-44	131	3,574
45-49	173	4,535
50-54	193	5,808
55 & Over	228	228
Total	958	18,899
Average Rate:	0.0507	

Female		
Age	Withdrawals	Exposure
25-29	20	157
30-34	129	1,450
35-39	198	3,195
40-44	275	4,301
45-49	389	7,127
50-54	493	11,112
55 & Over	403	403
Total	1,907	27,745
Average Rate:	0.0687	

**SLEP Group Members Who Left Active Status
During Calendar Year 2017
with Seven or More Years of Service**

Male		
Age	Withdrawals	Exposure
25-29	-	7
30-34	13	259
35-39	8	466
40-44	5	491
45-49	13	683
50-54	5	133
55 & Over	1	74
Total	45	2,113
Average Rate:	0.0213	

Female		
Age	Withdrawals	Exposure
25-29	-	1
30-34	2	48
35-39	-	64
40-44	2	97
45-49	1	85
50-54	1	32
55 & Over	-	26
Total	6	353
Average Rate:	0.0170	

**ECO Group Members Who Left Active Status
During Calendar Year 2017
with Eight or More Years of Service**

Male		
Age	Withdrawals	Exposure
25-29	-	-
30-34	-	-
35-39	1	5
40-44	1	4
45-49	-	7
50-54	2	15
55 & Over	4	4
Total	8	35
Average Rate:	0.2286	

Female		
Age	Withdrawals	Exposure
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	1
45-49	1	5
50-54	-	9
55 & Over	1	1
Total	2	16
Average Rate:	0.1250	

**ECO SLEP Group Members Who Left Active Status
During Calendar Year 2017
with Seven or More Years of Service**

Male		
Age	Withdrawals	Exposure
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	2
55 & Over	-	-
Total	-	2
Average Rate:	-	

Female		
Age	Withdrawals	Exposure
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	-
55 & Over	-	-
Total	-	-
Average Rate:	-	

**Regular Group Members Who Left Active Status
with No Monthly Benefit
During Calendar Year 2017
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	846	3,301
2	1,131	5,772
3	684	4,638
4	545	3,898
5	360	3,107
6	241	2,757
7	184	2,288
8	137	1,518
9	124	1,547
10	112	1,587
11	105	1,452
12	75	1,369
13	74	1,184
14	49	1,015
15	43	973
16	38	1,000
17	46	1,044
18	39	1,037
19	28	897
20	37	746
21	30	658
22	18	583
23	12	482
24	19	416
25	13	335
26	10	338
27	14	385
28	12	392
29	8	320
30 and Over	52	933
Totals (Less Than or Equal to 8 Years of Service)	4,128	27,279
Average Rate	0.1513	

Female		
Service Index	Withdrawals	Exposure
1	1,832	6,772
2	2,265	10,659
3	1,473	8,578
4	970	6,676
5	665	5,390
6	464	4,403
7	329	3,737
8	293	2,836
9	287	2,774
10	293	3,136
11	244	2,903
12	207	2,470
13	133	1,973
14	115	1,685
15	95	1,502
16	88	1,622
17	92	1,625
18	72	1,419
19	49	1,134
20	41	937
21	38	749
22	29	598
23	14	507
24	18	401
25	15	314
26	15	279
27	11	282
28	10	287
29	8	216
30 and Over	33	544
Totals (Less Than or Equal to 8 Years of Service)	8,291	49,051
Average Rate	0.1690	

**SLEP Group Members Who Left Active Status
with No Monthly Benefit
During Calendar Year 2017
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	11	81
2	19	186
3	13	171
4	17	159
5	7	130
6	8	120
7	3	108
8	2	93
9	4	134
10	4	173
11	5	145
12	8	154
13	3	147
14	2	140
15	3	121
16	2	129
17	-	118
18	2	112
19	1	125
20	1	108
21	2	95
22	-	75
23	2	77
24	-	42
25	1	39
26	-	36
27	1	28
28	1	13
29	1	8
30 and Over	-	5
Totals (Less Than or Equal to 7 Years of Service)	78	955
Average Rate	0.0817	

Female		
Service Index	Withdrawals	Exposure
1	6	16
2	3	22
3	3	23
4	3	26
5	-	18
6	2	26
7	-	18
8	-	17
9	2	25
10	-	29
11	1	29
12	-	16
13	1	29
14	-	26
15	-	18
16	-	28
17	1	24
18	-	26
19	-	22
20	-	14
21	-	14
22	-	8
23	1	9
24	-	6
25	-	1
26	-	4
27	-	3
28	-	3
29	-	2
30 and Over	-	-
Totals (Less Than or Equal to 7 Years of Service)	17	149
Average Rate	0.1141	

**ECO Group Members Who Left Active Status
with No Monthly Benefit
During Calendar Year 2017
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	-	-
2	-	1
3	-	1
4	-	-
5	-	1
6	-	2
7	-	7
8	1	2
9	1	7
10	-	2
11	1	3
12	-	-
13	-	2
14	-	-
15	1	1
16	-	-
17	-	3
18	-	3
19	-	1
20	1	-
21	1	-
22	-	1
23	-	2
24	-	-
25	-	3
26	-	-
27	1	1
28	-	-
29	-	-
30 and Over	2	2
Totals (Less Than or Equal to 8 Years of Service)	1	14
Average Rate	0.0714	

Female		
Service Index	Withdrawals	Exposure
1	-	-
2	-	1
3	-	-
4	-	-
5	-	-
6	-	-
7	-	5
8	1	1
9	2	3
10	-	3
11	-	-
12	-	-
13	-	1
14	-	1
15	-	2
16	-	1
17	-	1
18	-	1
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	1
29	-	-
30 and Over	-	1
Totals (Less Than or Equal to 8 Years of Service)	1	7
Average Rate	0.1429	

**ECO SLEP Group Members Who Left Active Status
with No Monthly Benefit
During Calendar Year 2017
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	3
8	-	-
9	-	-
10	-	-
11	-	1
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-
17	-	-
18	-	1
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30 and Over	-	-
Totals (Less Than or Equal to 7 Years of Service) Average Rate	-	3 0.0000

Female		
Service Index	Withdrawals	Exposure
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-
17	-	-
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30 and Over	-	-
Totals (Less Than or Equal to 7 Years of Service) Average Rate	-	- 0.0000

MORTALITY EXPERIENCE

Active Members Deaths During Calendar Year 2017

Male		
Age	Deaths	Exposure
Under 20	-	77
20-24	-	1,998
25-29	-	5,199
30-34	4	6,143
35-39	5	6,534
40-44	1	6,459
45-49	3	7,514
50-54	10	8,564
55-59	19	9,389
60-64	18	7,548
65-69	20	3,488
70-74	9	1,334
75 and Over	8	715
Totals	97	64,962
Average Rate:	0.0015	

Female		
Age	Deaths	Exposure
Under 20	-	99
20-24	-	2,521
25-29	-	6,561
30-34	-	7,335
35-39	-	9,071
40-44	1	10,786
45-49	1	14,350
50-54	9	17,443
55-59	19	19,144
60-64	16	14,356
65-69	9	5,409
70-74	1	1,504
75 and Over	3	588
Totals	59	109,167
Average Rate:	0.0005	

Retired Members Deaths During Calendar Year 2017

Male		
Age	Deaths	Exposure
Under 55	5	435
55-59	26	3,276
60-64	86	6,967
65-69	170	8,966
70-74	192	6,941
75-79	214	4,771
80-84	213	3,283
85-89	239	1,910
90-94	173	823
95-99	49	181
100-104	4	12
105 & Over	-	1
Totals	1,371	37,566
Actual Average Rate	0.0365	
Expected Average Rate	0.0370	

Female		
Age	Deaths	Exposure
Under 55	-	255
55-59	31	5,001
60-64	77	12,383
65-69	157	17,627
70-74	219	14,799
75-79	280	10,156
80-84	339	7,057
85-89	423	4,806
90-94	387	2,423
95-99	167	724
100-104	31	102
105 & Over	2	6
Totals	2,113	75,339
Actual Average Rate	0.0280	
Expected Average Rate	0.0273	

SALARY EXPERIENCE

Salary Increases by Age During Calendar Year 2017*

Age Group Beginning of Year	Pay Increase During the Next Year		
	Regular	SLEP	ECO
25-29	8.54 %	10.02 %	0.00 %
30-34	6.00 %	6.07 %	0.00 %
35-39	4.73 %	6.41 %	0.49 %
40-44	4.38 %	5.16 %	0.40 %
45-49	3.88 %	3.56 %	0.46 %
50-54	3.51 %	5.24 %	0.86 %
55-59	3.19 %	5.57 %	1.84 %
60-64	3.05 %	3.15 %	2.28 %
65-69	2.89 %	4.15 %	0.54 %
70-74	2.93 %	5.29 %	2.45 %
75 & Over	2.20 %	3.12 %	0.77 %
Averages:			
Expected	3.83 %	4.59 %	3.65 %
Actual	3.47 %	5.06 %	1.33 %

* Members active both at the beginning and end of year and have 5 or more years of service at the beginning of the year for Regular and ECO groups and 0 or more years of service for SLEP and ECO SLEP groups (increases for SLEP groups are correlated primarily with service).

Salary Increases by Years of Service During Calendar Year 2017*

Service Index	Pay Increase During the Next Year		
	Regular	SLEP	ECO
1	12.91 %	10.45 %	0.00 %
2	9.21 %	9.16 %	(2.21)%
3	6.76 %	5.26 %	3.08 %
4	5.90 %	6.70 %	0.00 %
5	5.65 %	4.91 %	0.00 %
6	5.38 %	6.06 %	0.10 %
7	4.48 %	5.78 %	(0.16)%
8	4.44 %	6.14 %	(0.73)%
9	4.10 %	6.69 %	1.55 %
10	4.11 %	5.29 %	(0.23)%
11	3.86 %	5.31 %	0.91 %
12	3.57 %	5.31 %	2.35 %
13	3.43 %	3.86 %	1.43 %
14	3.27 %	3.36 %	1.51 %
15	3.07 %	2.03 %	1.49 %
16	3.07 %	4.46 %	1.84 %
17	2.91 %	3.58 %	1.55 %
18	2.79 %	4.76 %	5.86 %
19	3.03 %	4.33 %	3.55 %
20	2.96 %	2.78 %	1.67 %
21	2.94 %	5.58 %	1.99 %
22	2.66 %	4.25 %	(0.00)%
23	2.74 %	3.68 %	5.65 %
24	2.55 %	4.20 %	0.00 %
25	2.50 %	2.39 %	2.00 %
26	2.34 %	4.24 %	(5.17)%
27	2.54 %	8.68 %	2.66 %
28	2.69 %	7.28 %	3.28 %
29	2.51 %	8.80 %	3.93 %
30	2.56 %	10.91 %	0.00 %
31	2.67 %	6.22 %	2.83 %
32	2.79 %	3.63 %	0.00 %
33	2.45 %	6.89 %	5.19 %
34	2.99 %	0.26 %	0.00 %
35	2.76 %	15.62 %	0.00 %
36	3.22 %	0.00 %	0.00 %
37	2.52 %	12.29 %	0.00 %
38	2.34 %	(0.66)%	1.77 %
39	2.81 %	2.20 %	(14.61)%
40	2.93 %	0.00 %	0.00 %
Averages:			
Expected	4.54 %	4.59 %	3.75 %
Actual	4.39 %	5.06 %	1.30 %

** Reported pay for most people with less than 1 year of service may have been for only a portion of a year.*



March 22, 2018

Mr. Mark Nannini
Chief Financial Officer
Illinois Municipal Retirement Fund
2211 South York Road, Suite 500
Oak Brook, Illinois 60523

Dear Mark:

Enclosed are five copies of the Gain/Loss Analysis of Financial Experience Among Active Members during the period of January 1, 2017 to December 31, 2017 for the Illinois Municipal Retirement Fund (IMRF).

Your comments and/or questions will be welcome.

Sincerely,

A handwritten signature in black ink that reads "Mark Buis". The signature is written in a cursive, slightly slanted style.

Mark Buis, FSA, EA, FCA, MAAA

MB:sc
Enclosures

cc: Audrey Brown-Ryce, IMRF