

# Illinois Municipal Retirement Fund

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

January 1, 2018 to December 31, 2018



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March 15, 2019

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, 2018 to December 31, 2018.**

This is one of several documents comprising the full actuarial report. For additional information please see the Annual Actuarial Valuation report dated February 28, 2019.

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.

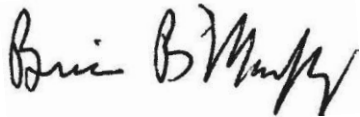
Brian B. Murphy, Mark Buis, and Francois Pieterse are Members of the American Academy of Actuaries (MAAA). These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

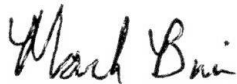
Gabriel, Roeder, Smith & Company will be pleased to review this valuation and report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY



Brian B. Murphy, FSA EA, FCA, MAAA



Mark Buis, FSA, EA, FCA, MAAA



Francois Pieterse, ASA, FCA, MAAA

BBM/MB/FP:ah

## 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 2018 gain/loss analysis is based on the active member population as reported for use in preparing the December 31, 2017 and December 31, 2018 regular annual actuarial valuations. Please note however, that counts shown in this report may not match the December 31, 2018 valuation or the December 31, 2017 gain/loss report since data records for members who have more than one record have been combined. The 2017 reported active member data was matched with the 2018 reported active/inactive member data and the 2018 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	170,587	4,119	124	11	174,841	
+ New People	23,238	313	0	0	23,551	
- Normal Retirement	4,638	153	17	5	4,813	5,218
- Early Retirement	1,054	0	0	0	1,054	1,263
- Vested Deferred Retirements	2,127	38	10	0	2,175	1,548
- Deaths	105	4	0	0	109	487
- Disabilities	301	11	0	0	312	56
- Other Terminations	13,950	139	1	2	14,092	13,109
End of Year Census	171,650	4,087	96	4	175,837	

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 (\$1,528) million** during the 2018 observation year, which is 3.62% of the beginning accrued liabilities. During the 2018 observation year, IMRF experienced a return on the Market Value of Assets of (4.1)%. The loss of \$386 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 loss 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 2018

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	
	2018	2017
Unfunded Liability January 1	\$ 2,991,680,344	\$ 4,585,312,875
(Assumed Payments)	(212,346,977)	(302,834,136)
Assumed Interest	216,508,988	332,679,056
Expected Unfunded Liability December 31	2,995,842,355	4,615,157,795
Change Due to Change in Assumptions	1,190,996,469	(1,094,614,950)
Change Due to Benefit Changes	0	0
Change Due to Investment Experience	385,776,439	(475,485,083)
Change Due to Demographic and Other Sources	(48,456,803)	(53,377,418)
Actual Unfunded Liability December 31	4,524,158,460	2,991,680,344
<b>Gain (Loss) for the Year</b>	<b>\$ (1,528,316,105)</b>	<b>\$ 1,623,477,451</b>

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

	Regular	SLEP	ECO	Total
<b>Prior Year</b>	<b>9.06 %</b>	<b>20.50 %</b>	<b>66.43 %</b>	<b>9.62 %</b>
Change in Discount Rate	1.57 %	2.90 %	6.68 %	1.63 %
Tier 2 Structure	(0.11)%	(0.16)%	0.00 %	(0.11)%
Investment Return	0.36 %	0.58 %	2.39 %	0.37 %
Pay Increases	0.02 %	0.58 %	(0.19)%	0.03 %
Demographic	0.01 %	(0.07)%	2.13 %	0.01 %
Payroll Growth	0.02 %	0.11 %	(3.41)%	0.02 %
Death and Disability Rate Change	0.04 %	0.04 %	0.04 %	0.04 %
Other	(0.06)%	0.00 %	(1.41)%	(0.05)%
<b>Current Year</b>	<b>10.91 %</b>	<b>24.48 %</b>	<b>72.66 %</b>	<b>11.56 %</b>

Although the contribution rate for most employers increased this year due to unfavorable asset performance and a reduction in the assumed investment return, it is important to note that the 2020 fiscal year contribution rate is still lower than the fiscal year 2018 contribution rate for the majority of all employers.

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.

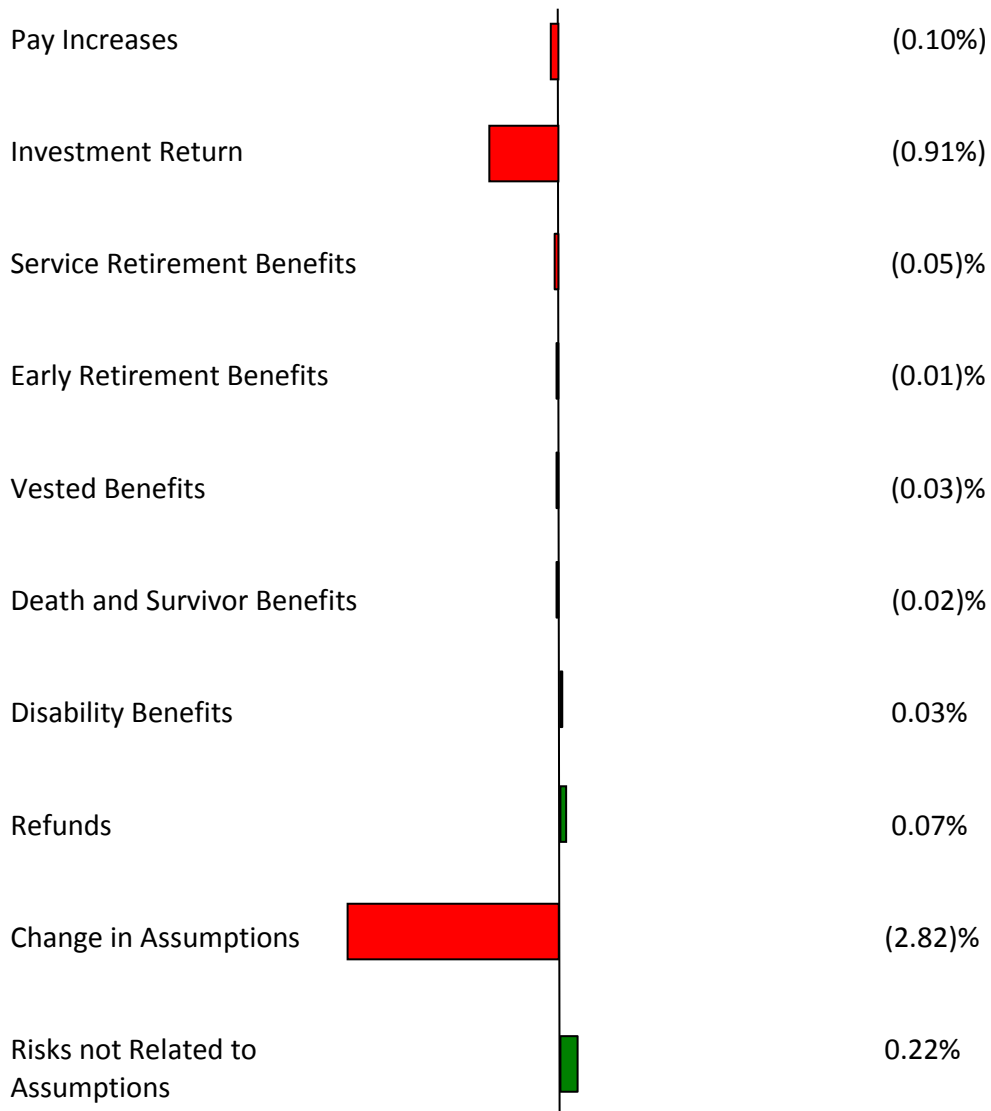
## Changes in Active Member Accrued Liabilities Gains & Losses by Risk Area During Calendar Year 2018

Type of Risk Area	Gain (Loss) in Period			Percent of Liabilities
	Regular	SLEP	Totals	
	Millions of \$			
<b>Risks Related to Assumptions</b>				
<b>Economic Risk Areas</b>				
<i>Pay Increases</i>	\$(15.0)	\$(25.1)	\$ (40.1)	(0.10)%
<i>Investment Return</i>			(385.8)	(0.91)%
<b>Demographic Risk Areas</b>				
<i>Service Retirements</i>	(17.9)	(1.6)	(19.5)	(0.05)%
<i>Early Retirements</i>	(5.3)	0.0	(5.3)	(0.01)%
<i>Vested Deferred Retirements</i>	(13.3)	(1.2)	(14.5)	(0.03)%
<i>Death and Survivor Benefits</i>	(8.0)	0.3	(7.7)	(0.02)%
<i>Disability Benefits</i>	9.7	1.8	11.5	0.03%
<i>Terminated with Refund</i>	27.3	3.9	31.2	0.07%
<b>Change in Discount Rate</b>			(1,191.0)	(2.82)%
<b>Risks not Related to Assumptions</b>			92.9	0.22%
<b>Total Gain (or Loss) During Period</b>			(1,528.3)	(3.62)%
<b>Beginning of Year Accrued Liabilities</b>			\$42,179.5	100.0%



# Gain/Loss Experience During Calendar Year 2018

## 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 / Change in Discount Rate	Other	Total Gain (Loss)	
											\$	Percent of Liabilities
1999 <sup>1</sup>	\$ 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 <sup>1</sup>	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 <sup>1</sup>	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 <sup>1</sup>	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) <sup>2</sup>	(195.2)	(0.7)%
2011 <sup>1</sup>	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 <sup>1</sup>	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 <sup>1</sup>	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 %
2018 <sup>4</sup>	(40.1)	(385.8)	(19.5)	(5.3)	(14.5)	(7.7)	11.5	31.2	(1,191.0)	92.9	(1,528.3)	(3.6)%

- 1 Changes in assumptions due to the Experience Study.
- 2 Includes one-time data changes of approximately \$250 million.
- 3 Includes Experience Study Changes.
- 4 Change in Investment Rate of Return.

## Development of Funding Value of Retirement System Assets Gain (Loss) from Investment Return During the Calendar Year 2018

Year Ended December 31	2017	2018	2019	2020	2021	2022
A. Funding Value Beginning of Year	\$36,773,397,527	\$39,187,802,312				
B. Market Value End of Year	41,312,666,221	38,755,630,459				
C. Market Value Beginning of Year	36,446,780,265	41,312,666,221				
D. Non-Investment/Administrative Net Cash Flow	(789,479,627)	(878,225,401)				
E. Investment Return						
E1. Market Total: B-C-D	5,655,365,583	(1,678,810,361)				
E2. Assumed Rate of Return	7.50%	7.50%				
<b>E3. Assumed Amount of Return</b>	<b>2,728,399,329</b>	<b>2,906,151,721</b>	-----Scheduled-----			
E4. Return Subject to Phase-in: E1-E3	2,926,966,254	(4,584,962,082)				
F. Phased-In Recognition of Investment Return						
F1. Current Year: 0.20xE4	585,393,251	(916,992,416)	Unknown	Unknown	Unknown	Unknown
F2. First Prior Year	3,107,243	531,215,977	\$(518,580,434)	Unknown	Unknown	Unknown
F3. Second Prior Year	(113,015,411)		-	\$(518,580,434)	Unknown	Unknown
F4. Third Prior Year	-	-	-	-	\$(518,580,434)	Unknown
F5. Fourth Prior Year	-	-	-	-	-	\$(518,580,432)
F6. Funding Corridor Adjustment	-	-				
<b>F7. Total Scheduled Phase-in of Gain/(Loss)</b>	<b>475,485,083</b>	<b>(385,776,439)</b>	(518,580,434)	(518,580,434)	(518,580,434)	(518,580,432)
G. Acceptable Phase-In of Investment Return						
G1. Projected Funding Value without Phase-In: A+D+E3	<b>38,712,317,229</b>	<b>41,215,728,632</b>				
G2. Limit on Phase-In: B-G1	2,600,348,992	(2,460,098,173)				
G3. Acceptable Phase-In Amount	475,485,083	(385,776,439)				
<b>H. Funding Value End of Year: A+D+E3+G3</b>	<b>39,187,802,312</b>	<b>40,829,952,193</b>				
I. Difference Between Market and Funding Value	2,124,863,909	(2,074,321,734)	(1,555,741,300)	(1,037,160,866)	(518,580,432)	-
J. Recognized Rate of Return	8.8 %	6.5 %				
K. Market Rate of Return	15.7 %	(4.1)%				
L. Ratio of Funding Value to Market Value	94.9 %	105.4 %				

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, 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
<b>Totals</b>	<b>29,234</b>	<b>20,862</b>	<b>9,925</b>	<b>1,108</b>	<b>53,757</b>	<b>40,927</b>	<b>13,931</b>	<b>843</b>	<b>170,587</b>

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
<b>Totals</b>	<b>13</b>	<b>49</b>	<b>16</b>	<b>1</b>	<b>5</b>	<b>27</b>	<b>9</b>	<b>4</b>	<b>124</b>

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
<b>Totals</b>	<b>1,150</b>	<b>1,650</b>	<b>732</b>	<b>12</b>	<b>173</b>	<b>300</b>	<b>101</b>	<b>1</b>	<b>4,119</b>

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									
<b>Totals</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>2</b>					<b>11</b>

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, 2018

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	2,495				3,376				5,871
25- 29	5,026	139			6,884	78			12,127
30- 34	4,230	1,284			6,701	1,178			13,393
35- 39	3,373	2,830	34		6,829	2,980	28		16,074
40- 44	2,496	3,044	503		7,234	3,797	408	1	17,483
45- 49	2,358	2,673	1,580	8	7,732	5,074	1,313	2	20,740
50	465	529	443	2	1,479	1,203	391		4,512
51	490	507	467	4	1,477	1,335	491	1	4,772
52	505	550	524	4	1,353	1,486	471	1	4,894
53	488	517	542	15	1,344	1,585	541	6	5,038
54	559	561	599	27	1,268	1,727	641	14	5,396
55	533	617	584	50	1,217	1,798	684	20	5,503
56	590	613	612	52	1,160	1,773	767	54	5,621
57	571	616	561	82	1,145	1,816	757	54	5,602
58	602	575	542	86	1,071	1,786	862	53	5,577
59	553	580	495	98	974	1,675	915	74	5,364
60	503	559	447	96	922	1,640	849	81	5,097
61	544	527	410	112	749	1,460	928	57	4,787
62	530	529	374	95	722	1,380	869	60	4,559
63	459	404	269	62	610	1,090	751	53	3,698
64	466	404	248	53	527	849	675	58	3,280
65	369	368	193	52	394	692	560	27	2,655
66	329	309	151	39	291	528	382	26	2,055
67	272	220	84	14	228	372	267	26	1,483
68	235	198	64	26	210	250	180	21	1,184
69	192	158	58	19	148	216	159	19	969
70 & Over	854	816	189	40	664	778	501	74	3,916
<b>Totals</b>	<b>30,087</b>	<b>20,127</b>	<b>9,973</b>	<b>1,036</b>	<b>56,709</b>	<b>38,546</b>	<b>14,390</b>	<b>782</b>	<b>171,650</b>

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, 2018

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		1							1
40- 44		6			1	1			8
45- 49		5	1		1	3			10
50		1	1						2
51		3							3
52		2	2			1			5
53		2	1			1			4
54						4			4
55	1	1	1				1		4
56	1	5				2		1	9
57		3				1		1	5
58	1					1			2
59	1	1	1						3
60		1				2			3
61			3				1	1	5
62		1	3			1	2		7
63		1					1	1	3
64		5		1					6
65		1	2						3
66							1		1
67		1							1
68		2					1		3
69		2							2
70 & Over		1						1	2
<b>Totals</b>	<b>4</b>	<b>45</b>	<b>15</b>	<b>1</b>	<b>2</b>	<b>17</b>	<b>7</b>	<b>5</b>	<b>96</b>

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, 2018

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	77				20				97
25- 29	365	3			43				411
30- 34	312	144			53	27			536
35- 39	190	447	3		31	66	1		738
40- 44	100	361	79		13	67	16		636
45- 49	62	296	348		13	55	36		810
50	10	43	82		1	4	12		152
51	17	34	50		1	5	7		114
52	8	25	48		1	6	3		91
53	6	21	28		1	6	1		63
54	9	25	17			8	5		64
55	6	15	26			3	7		57
56	7	13	15	1		6	3		45
57	2	17	14		1	3	2		39
58	11	11	7	2		8	4		43
59	6	16	13		1	4	2		42
60	3	12	7	1	1	1	4		29
61	5	10	4			1			20
62	6	4	3	1		2	2	1	19
63	3	8	7	1		3			22
64	2	6	3	2		1			14
65	5	7	1			1	2		16
66	2	9		2					13
67		1	1						2
68		2				1			3
69		2					1		3
70 & Over	2	4	2						8
<b>Totals</b>	<b>1,216</b>	<b>1,536</b>	<b>758</b>	<b>10</b>	<b>180</b>	<b>278</b>	<b>108</b>	<b>1</b>	<b>4,087</b>

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, 2018

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									
51									
52		1							1
53									
54									
55									
56									
57									
58									
59									
60									
61									
62		1							1
63									
64									
65									
66									
67									
68				2					2
69									
70 & Over									
<b>Totals</b>		<b>2</b>		<b>2</b>					<b>4</b>

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

# RETIREMENT EXPERIENCE

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## Active Regular Group Members Who Became Age & Service Retirees During Calendar Year 2018 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 55	11	11
55	20	69
56	22	86
57	22	114
58	30	114
59	22	121
60	100	1,175
61	117	1,200
62	180	1,048
63	144	858
64	105	776
65	170	707
66	176	615
67	93	386
68	71	328
69	55	259
70	56	203
71	36	190
72	23	147
73	26	107
74	22	107
75 & Up	107	476
Total (55 & Up)	1,597	9,086
Average Rate:	0.1758	

Female		
Age	Retirements	Exposure
Under 55	7	7
55	11	37
56	11	66
57	8	63
58	17	76
59	13	91
60	277	2,723
61	248	2,672
62	335	2,463
63	298	2,041
64	239	1,801
65	394	1,475
66	361	1,126
67	220	824
68	120	505
69	108	471
70	80	354
71	69	285
72	40	218
73	24	143
74	30	119
75 & Up	120	475
Total (55 & Up)	3,023	18,028
Average Rate:	0.1677	

## Active Regular Group Members Who Became Early Service Retirees During Calendar Year 2018

Male		
Age	Retirements	Exposure
55	74	1,310
56	78	1,261
57	66	1,259
58	59	1,196
59	50	1,044
Total	327	6,070
Average Rate:	0.0539	

Female		
Age	Retirements	Exposure
55	140	2,688
56	154	2,669
57	125	2,791
58	162	2,840
59	146	2,761
Total	727	13,749
Average Rate:	0.0529	

## Active SLEP Group Members Who Became Age & Service Retirees During Calendar Year 2018 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 50	-	-
50	23	98
51	15	51
52	16	59
53	7	29
54	4	27
55	9	29
56	5	16
57	4	17
58	5	16
59	3	16
60	4	20
61	5	16
62	7	15
63	7	23
64	5	15
65	1	10
66	5	11
67	2	4
68	2	4
69	1	4
70	1	3
71	1	3
72	-	-
73	-	1
74	1	1
75 & Up	1	2
Total (50 & Up)	134	490
Average Rate:	0.2735	

Female		
Age	Retirements	Exposure
Under 50	-	-
50	3	11
51	3	7
52	-	4
53	-	3
54	1	6
55	3	6
56	2	6
57	2	5
58	1	4
59	-	5
60	-	3
61	-	1
62	2	8
63	1	2
64	-	2
65	-	2
66	1	1
67	-	-
68	-	1
69	-	1
70	-	-
71	-	-
72	-	-
73	-	-
74	-	-
75 & Up	-	-
Total (50 & Up)	19	78
Average Rate:	0.2436	

**Active ECO Group Members Who Became Age & Service Retirees  
During Calendar Year 2018  
(Retirement with Benefit Beginning Immediately)**

Male		
Age	Retirements	Exposure
Under 55	-	-
55	2	4
56	1	6
57	-	3
58	-	-
59	-	2
60	1	4
61	-	4
62	-	1
63	-	4
64	1	7
65	1	2
66	1	3
67	-	-
68	-	2
69	-	2
70	-	1
71	-	-
72	-	-
73	-	-
74	-	-
75 & Up	1	1
Total (55 & Up)	8	46
Average Rate:	0.1739	

Female		
Age	Retirements	Exposure
Under 55	-	-
55	-	3
56	-	1
57	2	4
58	-	1
59	1	1
60	1	5
61	1	4
62	1	4
63	1	2
64	-	-
65	1	1
66	-	1
67	1	2
68	-	1
69	-	-
70	-	-
71	-	-
72	-	-
73	-	1
74	-	-
75 & Up	-	-
Total (55 & Up)	9	31
Average Rate:	0.2903	

## Active ECO SLEP Group Members Who Became Age & Service Retirees During Calendar Year 2018 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 50	-	-
50	-	-
51	1	-
52	-	-
53	1	1
54	-	-
55	-	-
56	-	-
57	1	1
58	-	-
59	-	-
60	-	-
61	-	1
62	1	2
63	-	-
64	-	-
65	-	-
66	-	-
67	-	2
68	1	1
69	-	-
70	-	-
71	-	-
72	-	-
73	-	-
74	-	-
75 & Up	-	-
Total (50 & Up)	5	8
Average Rate:	0.6250	

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

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## Regular Group Members Who Became Disability Retirees During Calendar Year 2018

Male		
Age	Disabilities*	Exposure
Under 20	-	76
20-24	1	1,996
25-29	2	5,004
30-34	3	5,480
35-39	6	6,134
40-44	15	5,938
45-49	17	6,620
50-54	24	7,792
55-59	35	9,108
60-64	24	7,356
65-69	6	3,592
70-74	5	1,324
75 and Over	-	709
Totals	138	61,129
Average Rate:	0.0023	

Female		
Age	Disabilities*	Exposure
Under 20	-	110
20-24	1	2,583
25-29	7	6,734
30-34	3	7,505
35-39	10	9,323
40-44	10	10,987
45-49	16	13,886
50-54	35	16,881
55-59	40	19,000
60-64	32	14,781
65-69	8	5,491
70-74	1	1,563
75 and Over	-	614
Totals	163	109,458
Average Rate:	0.0015	

*\* 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 2018

Male		
Age	Disabilities*	Exposure
Under 20	-	-
20-24	-	45
25-29	-	341
30-34	-	496
35-39	-	612
40-44	2	539
45-49	2	716
50-54	1	441
55-59	2	197
60-64	-	110
65-69	-	36
70-74	-	1
75 and Over	-	-
Totals	7	3,534
Average Rate:	0.0020	

Female		
Age	Disabilities*	Exposure
Under 20	-	-
20-24	-	10
25-29	-	52
30-34	-	80
35-39	-	94
40-44	1	94
45-49	3	109
50-54	-	66
55-59	-	48
60-64	-	17
65-69	-	5
70-74	-	-
75 and Over	-	-
Totals	4	575
Average Rate:	0.0070	

*\* 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 2018

Male		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	1
35-39	-	2
40-44	-	7
45-49	-	5
50-54	-	14
55-59	-	19
60-64	-	20
65-69	-	9
70-74	-	1
75 and Over	-	1
Totals	-	79
Average Rate:	-	

Female		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	2
45-49	-	5
50-54	-	7
55-59	-	10
60-64	-	15
65-69	-	5
70-74	-	1
75 and Over	-	-
Totals	-	45
Average Rate:	-	

## ECO SLEP Members Who Became Disability Retirees During Calendar Year 2018

Male		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	4
55-59	-	1
60-64	-	3
65-69	-	3
70-74	-	-
75 and Over	-	-
Totals	-	11
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**

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**Regular Group Members Who Left Active Status  
During Calendar Year 2018  
with Eight or More Years of Service**

<b>Male</b>		
<b>Age</b>	<b>Withdrawals</b>	<b>Exposure</b>
25-29	10	151
30-34	94	1,387
35-39	144	2,960
40-44	157	3,576
45-49	133	4,344
50-54	177	5,489
55 & Over	172	172
Total	887	18,079
Average Rate:	0.0491	

<b>Female</b>		
<b>Age</b>	<b>Withdrawals</b>	<b>Exposure</b>
25-29	15	100
30-34	110	1,277
35-39	228	3,145
40-44	275	4,273
45-49	390	6,647
50-54	478	10,409
55 & Over	446	446
Total	1,942	26,297
Average Rate:	0.0738	

**SLEP Group Members Who Left Active Status  
During Calendar Year 2018  
with Seven or More Years of Service**

<b>Male</b>		
<b>Age</b>	<b>Withdrawals</b>	<b>Exposure</b>
25-29	2	7
30-34	13	222
35-39	11	474
40-44	9	457
45-49	8	671
50-54	3	140
55 & Over	4	78
Total	50	2,049
Average Rate:	0.0244	

<b>Female</b>		
<b>Age</b>	<b>Withdrawals</b>	<b>Exposure</b>
25-29	-	2
30-34	2	40
35-39	2	70
40-44	1	85
45-49	1	98
50-54	1	30
55 & Over	-	22
Total	7	347
Average Rate:	0.0202	



**ECO Group Members Who Left Active Status  
During Calendar Year 2018  
with Eight or More Years of Service**

<b>Male</b>		
<b>Age</b>	<b>Withdrawals</b>	<b>Exposure</b>
25-29	-	-
30-34	-	-
35-39	-	2
40-44	1	7
45-49	-	4
50-54	1	14
55 & Over	3	3
Total	5	30
Average Rate:	0.1667	

<b>Female</b>		
<b>Age</b>	<b>Withdrawals</b>	<b>Exposure</b>
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	1
45-49	1	4
50-54	1	7
55 & Over	2	2
Total	4	14
Average Rate:	0.2857	

**ECO SLEP Group Members Who Left Active Status  
During Calendar Year 2018  
with Seven or More Years of Service**

<b>Male</b>		
<b>Age</b>	<b>Withdrawals</b>	<b>Exposure</b>
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	-
45-49	-	-
50-54	1	3
55 & Over	1	1
Total	2	4
Average Rate:	0.5000	

<b>Female</b>		
<b>Age</b>	<b>Withdrawals</b>	<b>Exposure</b>
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 2018  
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	818	3,289
2	1,180	5,571
3	775	4,740
4	526	4,031
5	363	3,395
6	240	2,768
7	210	2,549
8	159	1,692
9	90	1,130
10	108	1,407
11	98	1,466
12	73	1,316
13	66	1,261
14	56	1,076
15	48	943
16	40	905
17	37	933
18	36	946
19	32	956
20	20	815
21	24	677
22	33	599
23	21	530
24	17	427
25	13	364
26	6	308
27	4	293
28	6	332
29	12	325
30 and Over	47	921
Totals (Less Than or Equal to 8 Years of Service)	4,271	28,035
Average Rate	0.1523	

Female		
Service Index	Withdrawals	Exposure
1	1,990	7,211
2	2,424	10,944
3	1,571	8,707
4	1,066	7,313
5	710	5,842
6	532	4,926
7	402	3,996
8	282	2,861
9	244	2,158
10	275	2,476
11	205	2,770
12	208	2,532
13	195	2,145
14	131	1,742
15	116	1,461
16	78	1,302
17	87	1,437
18	88	1,404
19	63	1,228
20	46	975
21	41	785
22	20	628
23	31	511
24	14	422
25	15	337
26	10	275
27	13	233
28	13	243
29	10	242
30 and Over	39	569
Totals (Less Than or Equal to 8 Years of Service)	8,977	51,800
Average Rate	0.1733	

**SLEP Group Members Who Left Active Status  
with No Monthly Benefit  
During Calendar Year 2018  
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	21	97
2	21	182
3	15	175
4	26	166
5	7	142
6	6	124
7	8	115
8	8	105
9	5	87
10	8	130
11	4	169
12	8	139
13	1	147
14	1	140
15	4	136
16	1	117
17	-	125
18	-	117
19	-	110
20	4	110
21	2	92
22	2	82
23	-	69
24	-	58
25	1	38
26	-	30
27	-	27
28	-	15
29	-	5
30 and Over	1	4
Totals (Less Than or Equal to 7 Years of Service) Average Rate	104 0.1039	1,001

Female		
Service Index	Withdrawals	Exposure
1	3	14
2	1	22
3	3	23
4	3	23
5	3	26
6	3	18
7	-	23
8	-	18
9	-	19
10	1	22
11	2	30
12	-	29
13	-	15
14	1	26
15	2	26
16	-	18
17	1	27
18	-	23
19	-	26
20	-	19
21	-	11
22	-	11
23	-	8
24	-	7
25	-	5
26	-	-
27	-	2
28	-	2
29	-	2
30 and Over	-	1
Totals (Less Than or Equal to 7 Years of Service) Average Rate	16 0.1074	149

**ECO Group Members Who Left Active Status  
with No Monthly Benefit  
During Calendar Year 2018  
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	-	-
2	-	-
3	-	1
4	-	1
5	-	-
6	-	1
7	-	1
8	1	2
9	-	1
10	-	5
11	-	2
12	-	3
13	-	-
14	1	2
15	-	-
16	-	-
17	-	-
18	2	3
19	-	4
20	-	1
21	-	-
22	-	-
23	-	1
24	-	2
25	-	-
26	-	2
27	1	-
28	1	-
29	-	-
30 and Over	-	1
Totals (Less Than or Equal to 8 Years of Service) Average Rate	1 0.1667	6

Female		
Service Index	Withdrawals	Exposure
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	1	2
9	-	-
10	-	2
11	-	3
12	1	-
13	-	-
14	-	1
15	-	1
16	2	2
17	-	1
18	-	1
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30 and Over	1	1
Totals (Less Than or Equal to 8 Years of Service) Average Rate	1 0.5000	2

**ECO SLEP Group Members Who Left Active Status  
with No Monthly Benefit  
During Calendar Year 2018  
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	2	1
9	-	-
10	-	-
11	-	-
12	-	1
13	-	-
14	-	-
15	-	-
16	-	-
17	-	-
18	-	-
19	-	1
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	

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

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## Active Members Deaths During Calendar Year 2018

Male		
Age	Deaths	Exposure
Under 20	-	76
20-24	-	2,041
25-29	2	5,345
30-34	-	5,977
35-39	4	6,748
40-44	5	6,484
45-49	6	7,341
50-54	7	8,251
55-59	11	9,325
60-64	10	7,489
65-69	11	3,640
70-74	4	1,326
75 and Over	3	710
Totals	63	64,753
Average Rate:	0.0010	

Female		
Age	Deaths	Exposure
Under 20	-	110
20-24	1	2,593
25-29	-	6,786
30-34	1	7,585
35-39	-	9,417
40-44	-	11,083
45-49	1	14,000
50-54	7	16,954
55-59	8	19,058
60-64	14	14,813
65-69	9	5,501
70-74	3	1,564
75 and Over	2	614
Totals	46	110,078
Average Rate:	0.0004	



## Retired Members Deaths During Calendar Year 2018

Male		
Age	Deaths	Exposure
Under 55	-	420
55-59	29	3,184
60-64	104	7,169
65-69	129	9,373
70-74	183	7,428
75-79	231	5,138
80-84	235	3,479
85-89	233	1,882
90-94	154	850
95-99	62	191
100-104	8	19
105 & Over	-	1
Totals	1,368	39,134
Actual Average Rate	0.0350	
Expected Average Rate	0.0367	

Female		
Age	Deaths	Exposure
Under 55	3	248
55-59	27	5,043
60-64	87	12,715
65-69	135	18,619
70-74	204	15,599
75-79	275	11,023
80-84	357	7,377
85-89	399	4,845
90-94	380	2,486
95-99	194	764
100-104	35	113
105 & Over	6	7
Totals	2,102	78,839
Actual Average Rate	0.0267	
Expected Average Rate	0.0270	

## **SALARY EXPERIENCE**

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## Salary Increases by Age During Calendar Year 2018\*

Age Group Beginning of Year	Pay Increase During the Next Year		
	Regular	SLEP	ECO
25-29	8.54 %	14.52 %	0.00 %
30-34	6.72 %	7.92 %	0.00 %
35-39	6.15 %	6.31 %	0.00 %
40-44	5.29 %	5.14 %	0.10 %
45-49	4.73 %	5.32 %	1.06 %
50-54	4.52 %	6.22 %	1.53 %
55-59	4.36 %	6.79 %	2.15 %
60-64	4.06 %	6.78 %	1.74 %
65-69	3.93 %	4.76 %	1.99 %
70-74	3.68 %	5.35 %	2.51 %
75 & Over	3.01 %	0.72 %	0.96 %
Averages:			
Expected	3.74 %	4.53 %	3.63 %
Actual	4.46 %	6.13 %	1.74 %

\* 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 2018\*

Service Index	Pay Increase During the Next Year		
	Regular	SLEP	ECO
1	13.90 %	17.68 %	0.00 %
2	10.36 %	12.17 %	0.00 %
3	7.75 %	7.70 %	1.56 %
4	6.65 %	6.01 %	(5.75)%
5	6.36 %	6.21 %	0.00 %
6	6.05 %	6.85 %	0.00 %
7	5.57 %	6.05 %	0.99 %
8	5.39 %	5.88 %	1.82 %
9	5.35 %	5.88 %	1.10 %
10	4.97 %	6.09 %	(0.98)%
11	5.11 %	4.62 %	1.13 %
12	4.70 %	4.83 %	6.20 %
13	4.46 %	3.76 %	(0.39)%
14	4.38 %	4.82 %	1.73 %
15	4.30 %	4.23 %	0.85 %
16	4.77 %	5.91 %	5.18 %
17	4.19 %	6.54 %	1.86 %
18	4.00 %	5.29 %	0.93 %
19	4.09 %	5.81 %	2.69 %
20	4.05 %	5.27 %	0.84 %
21	3.90 %	5.61 %	3.46 %
22	3.68 %	5.78 %	3.74 %
23	3.73 %	5.68 %	(1.64)%
24	3.93 %	4.29 %	3.79 %
25	4.39 %	9.79 %	0.00 %
26	3.75 %	8.75 %	2.27 %
27	4.23 %	6.35 %	0.00 %
28	3.59 %	5.14 %	0.00 %
29	3.58 %	9.52 %	2.02 %
30	3.61 %	6.89 %	3.54 %
31	3.67 %	6.94 %	0.00 %
32	2.92 %	7.00 %	44.46 %
33	3.35 %	0.97 %	0.00 %
34	3.55 %	8.29 %	4.93 %
35	3.12 %	5.53 %	10.99 %
36	3.04 %	0.00 %	0.00 %
37	4.12 %	0.00 %	0.00 %
38	4.73 %	16.76 %	0.00 %
39	3.02 %	4.86 %	(0.25)%
40	4.45 %	2.29 %	0.00 %
Averages:			
Expected	4.52 %	4.53 %	3.71 %
Actual	5.48 %	6.13 %	1.65 %

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



March 15, 2019

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, 2018 to December 31, 2018 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:ah  
Enclosures

cc: Audrey Brown-Ryce, IMRF