

Illinois Municipal Retirement Fund

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

January 1, 2019 to December 31, 2019



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March 19, 2020

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, 2019 to December 31, 2019.**

This is one of several documents comprising the full actuarial report. For additional information please see the Annual Actuarial Valuation report dated March 13, 2020.

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.

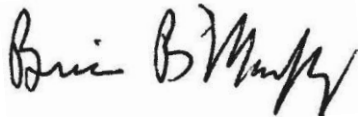
Brian B. Murphy, Mark Buis, and Francois Pieterse are Members of the American Academy of Actuaries (MAAA). These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

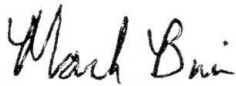
Gabriel, Roeder, Smith & Company will be pleased to review this valuation and report with the Board of Trustees and to answer any questions pertaining to the valuation.

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.***

Data Used. The 2019 gain/loss analysis is based on the active member population as reported for use in preparing the December 31, 2018 and December 31, 2019 regular annual actuarial valuations. Please note however, that counts shown in this report may not match the December 31, 2019 or the December 31, 2018 valuations since data records for members who have more than one record have been combined. The 2018 reported active member data was matched with the 2019 reported active/inactive member data and the 2019 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 on the following page.

Comments

	Active Population Reconciliation					
	Actual					Expected
	Regular	SLEP	ECO		Total	
			Regular	SLEP		
Beginning of Year Census	171,650	4,087	96	4	175,837	
+ New People	23,512	394	3	1	23,910	
- Normal Retirement	4,481	137	7	0	4,625	5,128
- Early Retirement	976	0	0	0	976	1,193
- Vested Deferred Retirements	1,943	52	4	0	1,999	1,339
- Deaths	120	0	0	0	120	492
- Disabilities	349	7	0	0	356	56
- Other Terminations	14,394	167	0	0	14,561	13,895
End of Year Census	172,899	4,118	88	5	177,110	

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 \$93 million** during the 2019 observation year, which is 0.20% of the beginning accrued liabilities. During the 2019 observation year, IMRF experienced a return on the Market Value of Assets of 19.2% (8.2% on Funding Value of Assets). The gain of \$367 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 2019

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	
	2019	2018
Unfunded Liability January 1	\$ 4,524,158,460	\$ 2,991,680,344
(Assumed Payments)	(336,629,003)	(212,346,977)
Assumed Interest	326,641,691	216,508,988
Expected Unfunded Liability December 31	4,514,171,148	2,995,842,355
Change Due to Change in Assumptions	0	1,190,996,469
Change Due to Benefit Changes	0	0
Change Due to Investment Experience	(367,178,690)	385,776,439
Change Due to Demographic and Other Sources	274,722,872	(48,456,803)
Actual Unfunded Liability December 31	4,421,715,330	4,524,158,460
Gain (Loss) for the Year	\$ 92,455,818	\$ (1,528,316,105)

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

	Regular	SLEP	ECO	Total
Prior Year	10.91 %	24.48 %	72.66 %	11.56 %
Tier 2 Structure	(0.12)%	(0.23)%	0.00 %	(0.12)%
Investment Return	(0.33)%	(0.54)%	(2.56)%	(0.34)%
Pay Increases	0.03 %	0.36 %	(0.18)%	0.04 %
Demographic	0.01 %	(0.02)%	0.54 %	0.01 %
Payroll Growth	0.01 %	0.01 %	1.83 %	0.01 %
Death and Disability Rate Change	0.04 %	0.04 %	0.04 %	0.04 %
Other	0.07 %	(0.40)%	(0.65)%	0.03 %
Current Year	10.62 %	23.70 %	71.68 %	11.23 %

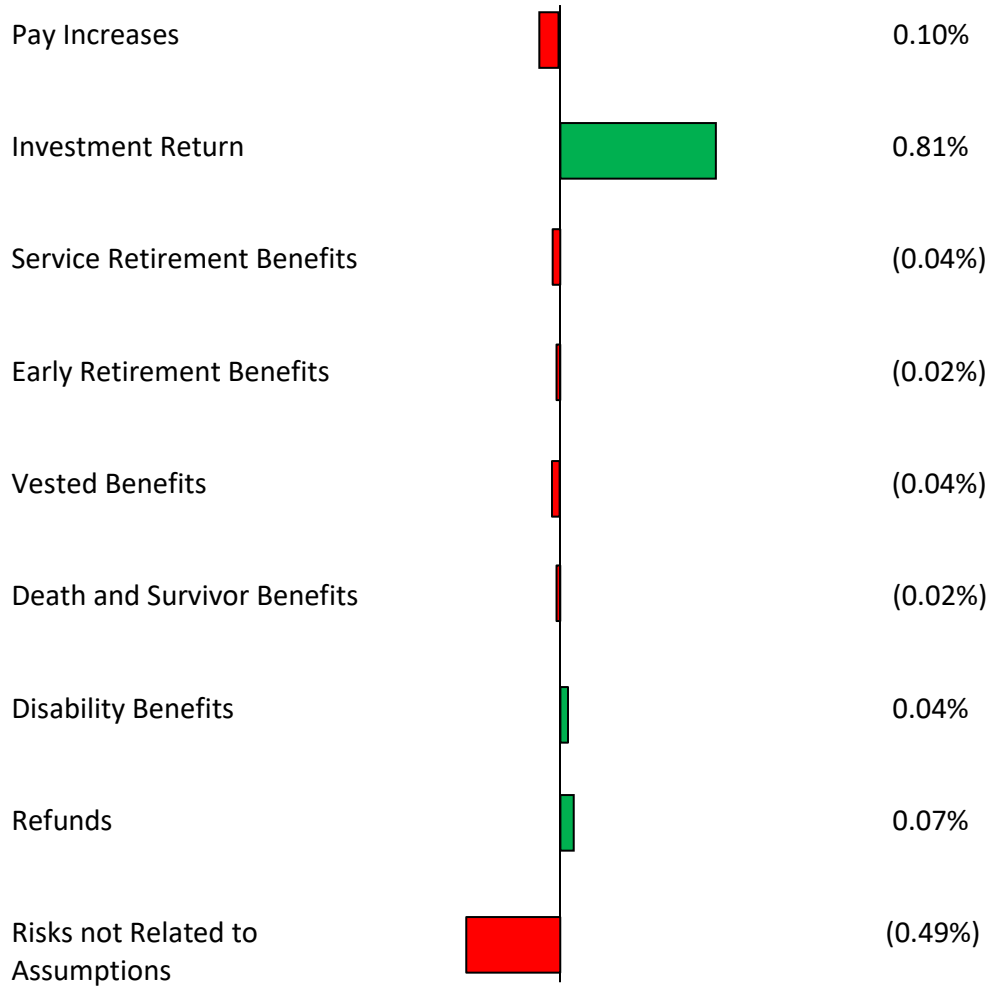
The next page shows the breakdown of the total gain or loss by source. Risk areas related to assumptions include economic risks and demographic risks. Economic risks relate to pay increases and investment return. Demographic risks relate to rates of retirement, death, disability, and other terminations. 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 2019

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>	\$(28.8)	\$(16.3)	\$ (45.1)	(0.10)%
<i>Investment Return</i>			367.2	0.81%
Demographic Risk Areas				
<i>Service Retirements</i>	(16.6)	(3.6)	(20.2)	(0.04)%
<i>Early Retirements</i>	(7.4)	0.0	(7.4)	(0.02)%
<i>Vested Deferred Retirements</i>	(18.8)	0.6	(18.2)	(0.04)%
<i>Death and Survivor Benefits</i>	(9.4)	(0.9)	(10.3)	(0.02)%
<i>Disability Benefits</i>	15.0	2.0	17.0	0.04%
<i>Terminated with Refund</i>	29.5	2.9	32.4	0.07%
Risks not Related to Assumptions			(222.9)	(0.49)%
Total Gain (or Loss) During Period			92.5	0.20%
Beginning of Year Accrued Liabilities			\$45,354.1	100.0%

Gain/Loss Experience During Calendar Year 2019

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 ³	Other	Total Gain (Loss)	
											\$	Percent of Liabilities
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 %
2018 ⁴	(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)%
2019	(45.1)	367.2	(20.2)	(7.4)	(18.2)	(10.3)	17.0	32.4		(222.9)	92.5	0.2 %

- 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 2019

Year Ended December 31	2018	2019	2020	2021	2022	2023
A. Funding Value Beginning of Year	\$39,187,802,312	\$40,829,952,193				
B. Market Value End of Year	38,755,630,459	44,923,481,136				
C. Market Value Beginning of Year	41,312,666,221	38,755,630,459				
D. Non-Investment/Administrative Net Cash Flow	(878,225,401)	(1,178,399,497)				
E. Investment Return						
E1. Market Total: B-C-D	(1,678,810,361)	7,346,250,174				
E2. Assumed Rate of Return	7.50%	7.25%				
E3. Assumed Amount of Return	2,906,151,721	2,917,454,552	-----Scheduled-----			
E4. Return Subject to Phase-in: E1-E3	(4,584,962,082)	4,428,795,622				
F. Phased-In Recognition of Investment Return						
F1. Current Year: 0.20x E4	(916,992,416)	885,759,124	Unknown	Unknown	Unknown	Unknown
F2. First Prior Year	531,215,977	(518,580,434)	\$496,823,800	Unknown	Unknown	Unknown
F3. Second Prior Year		-	-	\$496,823,800	Unknown	Unknown
F4. Third Prior Year	-	-	-	-	\$496,823,800	Unknown
F5. Fourth Prior Year	-	-	-	-	-	\$496,823,798
F6. Funding Corridor Adjustment	-					
F7. Total Scheduled Phase-in of Gain/(Loss)	(385,776,439)	367,178,690	496,823,800	496,823,800	496,823,800	496,823,798
G. Acceptable Phase-In of Investment Return						
G1. Projected Funding Value without Phase-In: A+D+E3	41,215,728,632	42,569,007,248				
G2. Limit on Phase-In: B-G1	(2,460,098,173)	2,354,473,888				
G3. Acceptable Phase-In Amount	(385,776,439)	367,178,690				
H. Funding Value End of Year: A+D+E3+G3	40,829,952,193	42,936,185,938				
I. Difference Between Market and Funding Value	(2,074,321,734)	1,987,295,198	1,490,471,398	993,647,598	496,823,798	-
J. Recognized Rate of Return (Funding Value)	6.5 %	8.2 %				
K. Market Rate of Return	(4.1)%	19.2 %				
L. Ratio of Funding Value to Market Value	105.4 %	95.6 %				

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, 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
Totals	30,087	20,127	9,973	1,036	56,709	38,546	14,390	782	171,650

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
Totals	4	45	15	1	2	17	7	5	96

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
Totals	1,216	1,536	758	10	180	278	108	1	4,087

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									
Totals		2		2					4

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, 2019

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	2,658				3,494				6,152
25- 29	4,984	105			7,052	64			12,205
30- 34	4,475	1,212			7,122	1,082			13,891
35- 39	3,420	2,804	26		7,232	2,865	34		16,381
40- 44	2,690	3,001	632		7,580	3,718	459		18,080
45- 49	2,453	2,503	1,617	8	7,667	4,687	1,404	3	20,342
50	471	523	453	4	1,642	1,281	386		4,760
51	482	496	484	2	1,468	1,189	461		4,582
52	498	473	503	6	1,456	1,322	551	2	4,811
53	527	525	550	8	1,348	1,457	543	4	4,962
54	504	499	550	27	1,299	1,531	626	14	5,050
55	599	525	594	51	1,259	1,658	706	25	5,417
56	536	566	542	57	1,189	1,659	711	23	5,283
57	601	579	595	54	1,162	1,656	829	55	5,531
58	574	577	526	104	1,148	1,619	858	59	5,465
59	594	561	517	86	1,035	1,652	920	65	5,430
60	576	541	462	95	916	1,512	964	81	5,147
61	508	518	411	97	872	1,439	846	84	4,775
62	536	478	350	115	670	1,270	929	60	4,408
63	491	451	315	78	670	1,123	837	58	4,023
64	432	383	239	48	571	894	710	48	3,325
65	418	373	196	52	473	687	593	57	2,849
66	312	305	143	39	344	472	408	17	2,040
67	291	269	114	25	253	370	263	20	1,605
68	232	204	65	15	197	292	225	22	1,252
69	211	193	51	22	191	214	157	14	1,053
70 & Over	893	798	205	48	732	780	532	92	4,080
Totals	30,966	19,462	10,140	1,041	59,042	36,493	14,952	803	172,899

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, 2019

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		4				1			5
45- 49		3	1			4			8
50		2				2			4
51			1						1
52		2	1						3
53		1	3			1			5
54		2	1			1			4
55						4			4
56	1	1					1		3
57		5				2		1	8
58	1	3				1		1	6
59	1					1			2
60	1	1	1						3
61		1				3			4
62			2	1			1	1	5
63		1	2			1	2		6
64		1					1		2
65		3		1					4
66		1	2						3
67							1		1
68									
69		2					1		3
70 & Over		3						1	4
Totals	4	36	14	2		21	7	4	88

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, 2019

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	102				18				120
25- 29	408	5			45	3			461
30- 34	353	110			43	26			532
35- 39	189	421			36	58			704
40- 44	116	400	63		14	71	15		679
45- 49	54	244	337		8	60	40		743
50	7	49	75		2	7	8		148
51	13	45	52		1	4	9		124
52	13	28	43		1	5	7		97
53	5	23	39		1	5	4		77
54	5	21	26		1	6	1		60
55	9	21	11			6	6		53
56	7	13	23			2	5		50
57	7	12	14	1		5	3		42
58	3	15	11			3	1		33
59	10	10	7	2		4	4		37
60	5	14	12	1	1	4	1		38
61	3	12	5	1		2	3		26
62	2	11	2			1			16
63	3	4	1	1		1	2	1	13
64	3	8	3	1		2	1		18
65	1	3	5	1		1			11
66	4	7	1	1			2		15
67	2	7		1					10
68		1							1
69		2				1			3
70 & Over	2	4	1						7
Totals	1,326	1,490	731	10	171	277	112	1	4,118

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, 2019

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		1							1
54									
55									
56									
57									
58									
59									
60									
61									
62									
63		1							1
64									
65									
66									
67									
68									
69				2					2
70 & Over									
Totals		3		2					5

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 2019 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 55	18	18
55	19	68
56	19	70
57	10	85
58	28	126
59	21	116
60	111	1,110
61	104	1,073
62	203	1,090
63	141	875
64	99	725
65	154	682
66	142	539
67	102	452
68	59	310
69	46	264
70	54	207
71	37	154
72	29	155
73	30	130
74	16	85
75 & Up	105	458
Total (55 & Up)	1,529	8,774
Average Rate:	0.1743	

Female		
Age	Retirements	Exposure
Under 55	5	5
55	13	40
56	8	36
57	12	73
58	11	73
59	13	86
60	255	2,693
61	202	2,464
62	331	2,440
63	311	2,140
64	218	1,744
65	444	1,569
66	357	1,079
67	210	773
68	117	609
69	86	392
70	90	365
71	56	278
72	39	219
73	36	172
74	26	120
75 & Up	94	430
Total (55 & Up)	2,929	17,795
Average Rate:	0.1646	

Active Regular Group Members Who Became Early Service Retirees During Calendar Year 2019

Male		
Age	Retirements	Exposure
55	73	1,170
56	73	1,212
57	56	1,158
58	71	1,148
59	53	1,116
Total	326	5,804
Average Rate:	0.0562	

Female		
Age	Retirements	Exposure
55	122	2,515
56	140	2,538
57	120	2,501
58	129	2,647
59	139	2,665
Total	650	12,866
Average Rate:	0.0505	

Active SLEP Group Members Who Became Age & Service Retirees During Calendar Year 2019 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 50	-	-
50	25	88
51	21	77
52	8	38
53	10	46
54	8	25
55	6	29
56	6	22
57	5	14
58	4	16
59	2	13
60	5	26
61	4	16
62	5	12
63	3	9
64	3	15
65	-	11
66	1	9
67	1	6
68	1	2
69	-	2
70	-	2
71	2	2
72	-	1
73	-	-
74	1	1
75 & Up	-	1
Total (50 & Up)	121	483
Average Rate:	0.2505	

Female		
Age	Retirements	Exposure
Under 50	-	-
50	4	13
51	1	9
52	-	5
53	-	4
54	-	3
55	1	8
56	1	3
57	2	6
58	1	3
59	3	5
60	1	7
61	-	3
62	-	1
63	-	6
64	-	1
65	1	2
66	-	2
67	-	-
68	-	-
69	-	1
70	1	1
71	-	-
72	-	-
73	-	-
74	-	-
75 & Up	-	-
Total (50 & Up)	16	83
Average Rate:	0.1928	

**Active ECO Group Members Who Became Age & Service Retirees
During Calendar Year 2019
(Retirement with Benefit Beginning Immediately)**

Male		
Age	Retirements	Exposure
Under 55	-	-
55	1	1
56	-	2
57	1	6
58	-	2
59	-	-
60	-	2
61	-	3
62	1	4
63	-	1
64	1	3
65	1	6
66	-	1
67	1	1
68	-	-
69	-	2
70	-	2
71	-	1
72	-	-
73	-	-
74	-	-
75 & Up	-	-
Total (55 & Up)	6	37
Average Rate:	0.1622	

Female		
Age	Retirements	Exposure
Under 55	-	-
55	-	1
56	-	3
57	-	1
58	-	2
59	-	1
60	-	-
61	-	3
62	-	3
63	-	2
64	1	1
65	-	-
66	-	-
67	-	1
68	-	1
69	-	-
70	-	-
71	-	-
72	-	-
73	-	-
74	-	1
75 & Up	-	-
Total (55 & Up)	1	20
Average Rate:	0.0500	

Active ECO SLEP Group Members Who Became Age & Service Retirees During Calendar Year 2019 (Retirement with Benefit Beginning Immediately)

Male		
Age	Retirements	Exposure
Under 50	-	-
50	-	-
51	-	-
52	-	-
53	-	-
54	-	-
55	-	-
56	-	-
57	-	-
58	-	-
59	-	-
60	-	-
61	-	-
62	-	-
63	-	1
64	-	-
65	-	-
66	-	-
67	-	-
68	-	2
69	-	-
70	-	-
71	-	-
72	-	-
73	-	-
74	-	-
75 & Up	-	-
Total (50 & Up)	-	3
Average Rate:	-	

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 2019

Male		
Age	Disabilities*	Exposure
Under 20	-	78
20-24	-	2,005
25-29	1	4,981
30-34	5	5,528
35-39	6	6,135
40-44	5	6,110
45-49	12	6,498
50-54	35	7,577
55-59	48	9,121
60-64	30	7,345
65-69	12	3,730
70-74	2	1,378
75 and Over	3	737
Totals	159	61,223
Average Rate:	0.0026	

Female		
Age	Disabilities*	Exposure
Under 20	-	111
20-24	-	2,638
25-29	1	6,789
30-34	11	7,828
35-39	10	9,617
40-44	9	11,222
45-49	19	13,778
50-54	33	16,484
55-59	53	18,751
60-64	42	15,091
65-69	9	5,836
70-74	2	1,680
75 and Over	1	602
Totals	190	110,427
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.*

SLEP Group Members Who Became Disability Retirees During Calendar Year 2019

Male		
Age	Disabilities*	Exposure
Under 20	-	1
20-24	-	52
25-29	-	349
30-34	-	443
35-39	1	631
40-44	-	555
45-49	4	678
50-54	-	478
55-59	-	190
60-64	-	96
65-69	-	38
70-74	-	2
75 and Over	-	-
Totals	5	3,513
Average Rate:	0.0014	

Female		
Age	Disabilities*	Exposure
Under 20	-	-
20-24	-	16
25-29	-	42
30-34	-	78
35-39	1	92
40-44	-	101
45-49	-	99
50-54	-	67
55-59	-	47
60-64	1	19
65-69	-	5
70-74	-	-
75 and Over	-	-
Totals	2	566
Average Rate:	0.0035	

** 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 2019

Male		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	-
35-39	-	1
40-44	-	6
45-49	-	5
50-54	-	13
55-59	-	13
60-64	-	14
65-69	-	10
70-74	-	3
75 and Over	-	-
Totals	-	65
Average Rate:	-	

Female		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	2
45-49	-	4
50-54	-	5
55-59	-	8
60-64	-	9
65-69	-	2
70-74	-	1
75 and Over	-	-
Totals	-	31
Average Rate:	-	

ECO SLEP Members Who Became Disability Retirees During Calendar Year 2019

Male		
Age	Disabilities	Exposure
Under 20	-	-
20-24	-	-
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	1
55-59	-	-
60-64	-	1
65-69	-	2
70-74	-	-
75 and Over	-	-
Totals	-	4
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 2019
with Eight or More Years of Service**

Male		
Age	Withdrawals	Exposure
25-29	7	116
30-34	78	1,278
35-39	135	2,869
40-44	140	3,631
45-49	137	4,213
50-54	174	5,221
55 & Over	213	213
Total	884	17,541
Average Rate:	0.0504	

Female		
Age	Withdrawals	Exposure
25-29	9	67
30-34	97	1,174
35-39	212	3,000
40-44	230	4,216
45-49	323	6,284
50-54	450	9,678
55 & Over	449	449
Total	1,770	24,868
Average Rate:	0.0712	

**SLEP Group Members Who Left Active Status
During Calendar Year 2019
with Seven or More Years of Service**

Male		
Age	Withdrawals	Exposure
25-29	2	14
30-34	9	166
35-39	18	478
40-44	13	463
45-49	21	628
50-54	6	158
55 & Over	3	66
Total	72	1,973
Average Rate:	0.0365	

Female		
Age	Withdrawals	Exposure
25-29	-	3
30-34	1	37
35-39	2	66
40-44	2	92
45-49	3	91
50-54	1	28
55 & Over	3	20
Total	12	337
Average Rate:	0.0356	

**ECO Group Members Who Left Active Status
During Calendar Year 2019
with Eight or More Years of Service**

Male		
Age	Withdrawals	Exposure
25-29	-	-
30-34	-	-
35-39	1	1
40-44	2	6
45-49	-	5
50-54	1	13
55 & Over	-	-
Total	4	25
Average Rate:	0.1600	

Female		
Age	Withdrawals	Exposure
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	2
45-49	-	4
50-54	-	5
55 & Over	-	-
Total	-	11
Average Rate:	-	

**ECO SLEP Group Members Who Left Active Status
During Calendar Year 2019
with Seven or More Years of Service**

Male		
Age	Withdrawals	Exposure
25-29	-	-
30-34	-	-
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	1
55 & Over	-	-
Total	-	1
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 2019
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	874	3,480
2	1,117	5,665
3	716	4,511
4	539	4,032
5	383	3,540
6	265	3,052
7	208	2,548
8	173	2,217
9	119	1,475
10	87	1,026
11	72	1,286
12	91	1,338
13	59	1,227
14	50	1,167
15	58	979
16	44	850
17	35	847
18	27	856
19	35	875
20	23	879
21	23	746
22	28	621
23	19	537
24	14	479
25	7	379
26	14	323
27	7	265
28	7	257
29	9	283
30 and Over	56	893
Totals (Less Than or Equal to 8 Years of Service)	4,275	29,045
Average Rate	0.1472	

Female		
Service Index	Withdrawals	Exposure
1	2,096	7,835
2	2,514	11,459
3	1,636	8,866
4	1,051	7,358
5	811	6,379
6	553	5,246
7	459	4,453
8	288	3,415
9	242	2,398
10	217	1,911
11	176	2,161
12	169	2,444
13	193	2,248
14	126	1,840
15	102	1,512
16	76	1,257
17	67	1,101
18	65	1,242
19	57	1,212
20	55	1,070
21	32	831
22	36	678
23	26	540
24	20	428
25	23	370
26	18	275
27	8	237
28	4	196
29	13	217
30 and Over	45	579
Totals (Less Than or Equal to 8 Years of Service)	9,408	55,011
Average Rate	0.1710	

**SLEP Group Members Who Left Active Status
with No Monthly Benefit
During Calendar Year 2019
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	25	117
2	26	195
3	15	166
4	17	167
5	17	148
6	7	140
7	6	119
8	6	106
9	8	102
10	7	83
11	4	124
12	8	165
13	9	131
14	1	143
15	3	138
16	1	127
17	2	113
18	1	120
19	2	115
20	5	90
21	3	92
22	4	81
23	2	70
24	1	58
25	-	45
26	-	29
27	3	23
28	2	15
29	-	7
30 and Over	-	4
Totals (Less Than or Equal to 7 Years of Service) Average Rate	113 0.1074	1,052

Female		
Service Index	Withdrawals	Exposure
1	1	16
2	7	27
3	2	21
4	3	22
5	2	20
6	5	25
7	2	15
8	1	23
9	1	18
10	-	18
11	-	22
12	1	28
13	3	26
14	-	15
15	-	24
16	-	25
17	-	17
18	1	28
19	-	21
20	2	22
21	-	15
22	2	9
23	1	9
24	-	6
25	-	6
26	-	3
27	-	-
28	-	1
29	-	1
30 and Over	-	1
Totals (Less Than or Equal to 7 Years of Service) Average Rate	22 0.1507	146

**ECO Group Members Who Left Active Status
with No Monthly Benefit
During Calendar Year 2019
(Non-Vested Separations)**

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

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

**ECO SLEP Group Members Who Left Active Status
with No Monthly Benefit
During Calendar Year 2019
(Non-Vested Separations)**

Male		
Service Index	Withdrawals	Exposure
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	1
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	

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 2019

Male		
Age	Deaths	Exposure
Under 20	-	79
20-24	-	2,057
25-29	-	5,330
30-34	3	5,971
35-39	2	6,767
40-44	3	6,671
45-49	5	7,181
50-54	10	8,069
55-59	12	9,324
60-64	20	7,456
65-69	12	3,780
70-74	5	1,383
75 and Over	3	737
Totals	75	64,805
Average Rate:	0.0012	

Female		
Age	Deaths	Exposure
Under 20	-	111
20-24	-	2,654
25-29	-	6,831
30-34	-	7,906
35-39	-	9,709
40-44	1	11,325
45-49	2	13,881
50-54	4	16,556
55-59	8	18,806
60-64	16	15,119
65-69	5	5,843
70-74	6	1,681
75 and Over	3	602
Totals	45	111,024
Average Rate:	0.0004	

Retired Members Deaths During Calendar Year 2019

Male		
Age	Deaths	Exposure
Under 55	3	428
55-59	19	3,209
60-64	82	7,169
65-69	170	9,775
70-74	184	8,032
75-79	233	5,476
80-84	232	3,525
85-89	232	1,951
90-94	184	876
95-99	59	188
100-104	5	12
105 & Over	1	2
Totals	1,404	40,643
Actual Average Rate	0.0345	
Expected Average Rate	0.0365	

Female		
Age	Deaths	Exposure
Under 55	2	240
55-59	23	5,126
60-64	75	12,982
65-69	142	19,527
70-74	202	16,829
75-79	249	11,667
80-84	367	7,763
85-89	408	4,807
90-94	370	2,550
95-99	178	782
100-104	40	125
105 & Over	2	5
Totals	2,058	82,403
Actual Average Rate	0.0250	
Expected Average Rate	0.0266	

SALARY EXPERIENCE

Salary Increases by Age During Calendar Year 2019*

Age Group Beginning of Year	Pay Increase During the Next Year		
	Regular	SLEP	ECO
25-29	6.70 %	13.26 %	0.00 %
30-34	6.98 %	9.60 %	0.00 %
35-39	5.84 %	7.50 %	0.00 %
40-44	4.96 %	6.42 %	0.00 %
45-49	4.64 %	5.87 %	0.76 %
50-54	4.50 %	5.47 %	3.31 %
55-59	4.09 %	5.93 %	2.19 %
60-64	3.80 %	4.33 %	1.89 %
65-69	3.74 %	4.04 %	2.00 %
70-74	3.45 %	6.93 %	0.30 %
75 & Over	3.13 %	1.82 %	(0.04)%
Averages:			
Expected	3.72 %	4.58 %	3.57 %
Actual	4.27 %	6.30 %	1.86 %

* 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 2019

Service Index	Pay Increase During the Next Year		
	Regular	SLEP	ECO
1	16.10 %	15.81 %	0.00 %
2	10.67 %	11.75 %	0.00 %
3	7.70 %	8.76 %	0.00 %
4	6.76 %	8.90 %	1.30 %
5	6.43 %	7.18 %	9.18 %
6	6.21 %	8.20 %	0.00 %
7	5.42 %	6.38 %	0.00 %
8	5.46 %	5.48 %	2.08 %
9	5.09 %	7.23 %	4.07 %
10	5.35 %	9.12 %	0.00 %
11	4.91 %	7.37 %	3.30 %
12	4.55 %	8.17 %	1.12 %
13	4.48 %	6.73 %	0.22 %
14	4.33 %	5.26 %	0.00 %
15	3.79 %	4.99 %	1.40 %
16	3.99 %	6.65 %	1.88 %
17	3.99 %	5.42 %	1.47 %
18	4.00 %	5.45 %	2.31 %
19	3.70 %	4.52 %	1.92 %
20	3.74 %	5.59 %	(2.25)%
21	3.53 %	4.77 %	(1.69)%
22	3.27 %	4.51 %	0.71 %
23	3.62 %	3.22 %	2.25 %
24	3.42 %	3.88 %	1.21 %
25	3.54 %	5.20 %	7.84 %
26	3.57 %	4.21 %	0.00 %
27	3.36 %	2.45 %	2.70 %
28	3.16 %	7.91 %	0.00 %
29	3.76 %	3.88 %	0.00 %
30	3.48 %	2.59 %	0.77 %
31	3.40 %	5.12 %	0.91 %
32	2.88 %	(3.34)%	0.00 %
33	3.13 %	(0.43)%	0.00 %
34	3.41 %	4.96 %	0.00 %
35	3.86 %	3.34 %	4.70 %
36	3.08 %	4.95 %	0.00 %
37	3.87 %	0.00 %	0.00 %
38	4.10 %	0.00 %	0.00 %
39	3.10 %	(18.48)%	0.00 %
40	3.17 %	0.54 %	(0.46)%
Averages:			
Expected	4.52 %	4.58 %	3.64 %
Actual	5.46 %	6.30 %	1.94 %



March 19, 2020

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, 2019 to December 31, 2019 for the Illinois Municipal Retirement Fund (IMRF).

Your comments and/or questions will be welcome.

Sincerely,

A handwritten signature in black ink, appearing to read "F. Pieterse". The signature is written in a cursive, flowing style.

Francois Pieterse, ASA, FCA, MAAA

FP:ah
Enclosures

cc: Audrey Brown-Ryce, IMRF