



**MUNICIPAL FIRE AND POLICE  
RETIREMENT SYSTEM OF IOWA**

**Analysis of System Experience  
July 1, 2007 through June 30, 2017**

**Wisdom at Work.**  
SILVERSTONEGROUP.COM



March 20, 2018

**PERSONAL AND CONFIDENTIAL**

Board of Trustees  
Municipal Fire and Police Retirement System of Iowa  
7155 Lake Drive, Suite 201  
West Des Moines, IA 50266

RE: Analysis of System Experience

Dear Board Members:

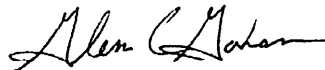
We are pleased to submit this experience report of the Municipal Fire and Police Retirement System of Iowa. The report presents the results of an analysis of System experience, which was determined in accordance with Iowa Code Chapter 411.5.10. The results presented in this report are based on member census data collected annually as of July 1 for the years 2007 through 2017 and supplied by the Municipal Fire and Police Retirement System of Iowa, and current System assumptions used in the most recently completed actuarial valuation as of July 1, 2017.

The purposes of this report are:

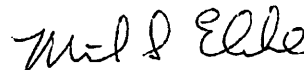
1. To satisfy the requirement of an actuarial investigation of tables and rates as specified under Iowa Code Chapter 411.5.10; and
2. To evaluate emerging experience of the System against the current actuarial assumptions.

To the best of our knowledge, the information supplied in this report is complete and accurate. The undersigned meets the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinion contained in this report.

Sincerely,



Glen C. Gahan, FSA  
Principal  
Member of American Academy  
of Actuaries  
Enrolled Actuary No. 17-4875



Michael S. Ehmke, ASA  
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GCG/MSE/cn

Enclosure

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## Overview

### Introduction

This study contains a summary of recent experience of the Municipal Fire and Police Retirement System of Iowa ("System"), identifies assumptions that should be considered to be changed based on actual prior experience and expected future events, and presents detailed comparisons of actual and expected experience by assumption. The next steps for the Board of Trustees ("Board") to consider are to confirm alternative assumptions to examine further which may lead to either specifically change an assumption or to retain the current assumption. The assumptions analyzed in this study were:

- Investment Return on Assets
- Active Annual Salary Increases
- Active Withdrawals
- Active Ordinary Disability Retirements
- Active Accidental Disability Retirements
- Active Service Retirements
- Active Ordinary Deaths
- Active Accidental Deaths
- Active DROP Participation
- Active DROP Premature Withdrawals
- Inactive Deaths for Service Retirements
- Inactive Deaths for Beneficiaries
- Inactive Deaths for Disability Retirements

### Background of Experience Study

SilverStone Group was engaged to prepare an analysis of experience of the System for the period July 1, 2007 to June 30, 2017. The purpose of this study is to compare actual experience of the System with the current actuarial assumptions used in the annual actuarial valuation, to make any observations and suggest to the Board to evaluate alternative assumptions based on the historical actual experience and to take into account consideration of expected future experience.

This study was prepared based on the data used for the actuarial valuations completed as of July 1 annually for the years 2007 through 2017. In preparing this study, we relied on the data used for prior years' actuarial valuations without performing additional audit, other than that annually conducted in association with the actuarial valuation. If any data or other information supplied is inaccurate or incomplete, the results of this study may need to be revised.

## Overview

### Purpose of Experience Study

The purpose of an actuarial valuation is to provide estimates of the ultimate cost of benefits provided by the System to its members. An actuarial valuation of the System is conducted annually to determine the statutorily required contribution rate of the Cities' under Iowa Code Chapter 411 and report the funded status of the System as of the valuation date. The actuarial valuation requires the use of assumptions with respect to the occurrence of future events, including both economic (such as investment earnings on assets and salary increases of active members) and demographic (such as rates of retirement, disability, withdrawal and death) events. Therefore, the contribution rate of the Cities' and funded status of the System is dependent on the assumptions used in the actuarial valuation and is sensitive to changes in those assumptions. However, it is important to note assumptions do not impact the true costs of the System's benefits over the long-term as those costs will be based on actual experience of the System. The assumptions only impact the timing and amount of pre-funding of the benefits that ultimately get paid from the System.

To the extent actual experience differs from that expected based on the assumptions, actuarial gains or losses will materialize. An actuarial gain emerges when actual experience is more favorable than assumed, while an actuarial loss emerges when actual experience is less favorable than assumed. Actuarial gains will decrease the Cities' contribution rate and increase the funded status of the System. Actuarial losses will increase the Cities' contribution rate and decrease the funded status of the System.

The purpose of an experience study is ultimately to determine whether the actuarial assumptions currently used are accurately predicting emerging experience. The experience study, along with the input of the System's advisors and Board of Trustees, should be used to evaluate the continued use of the current actuarial assumptions or consider alternative assumptions. It is also important to note that while actual historical experience is helpful in setting actuarial assumptions for future events, if future expectations have changed during the period of the experience study, weight should also be given to those future expectations when setting actuarial assumptions.

The Board of Trustees under Iowa Code Chapter 411.5.10-11 prescribes the actuarial assumptions used in the actuarial valuation, and thus they are considered prescribed assumptions by another party under applicable actuarial standards of practice.

## Summary of Results – Economic Assumptions

Economic assumptions are those assumptions related to the general economy and its impact on the System. The economic assumptions used in the actuarial valuation include the rate of investment return on System assets and salary increases.

### Investment Return on Assets

The investment return assumption is used to determine the liabilities associated with the benefits to be provided by the System. The investment return represents the time value of money reflected in the present value of estimated future benefit payments. The investment return assumption should represent the long-term rate of return on assets of the System, considering the asset allocation policy and expected long-term rates of return of the various asset classes invested in by the System.

The current assumed rate of investment return on System assets is 7.5%. The actuarial asset method used to value System assets is a smoothing method in which investment returns in excess of, or less than, 7.5% are spread over five years. This smoothing method eliminates large fluctuations in asset values from year to year and typically produces smoother contribution levels over time as compared to using the market value of assets. The annual rate of return on the actuarial value of assets and market value of assets has been as follows:

<u>July 1 - June 30</u>	<u>Actual Annual Return</u>	
	<u>Actuarial Value</u>	<u>Market Value</u>
1997/98	12.86%	11.01%
1998/99	12.31	9.78
1999/00	10.85	9.12
2000/01	5.89	(5.74)
2001/02	2.10	(2.76)
2002/03	0.81	5.25
2003/04	3.14	18.48
2004/05	8.67	12.24
2005/06	12.69	13.66
2006/07	15.77	18.87
2007/08	9.57	(2.09)
2008/09	2.75	(21.81)
2009/10	1.02	10.95
2010/11	3.20	23.15
2011/12	1.06	0.22
2012/13	4.02	13.04
2013/14	12.96	18.47
2014/15	11.43	3.07
2015/16	6.88	0.01
2016/17	8.37	11.75
Actual Compounded Annual Average – Last 5 Years	8.69%	9.06%
Actual Compounded Annual Average – Last 10 Years	6.05%	4.92%
Actual Compounded Annual Average – Last 15 Years	6.72%	7.74%
Expected Annual Compounded Annual Average	7.50%	7.50%

## Summary of Results – Economic Assumptions

It should be noted the past 15 years of returns on the market value of assets have included, based on a historical perspective, three unusually high periods of equity returns in the late 1990s, mid-2000s and early 2010s followed by two unusually low periods of equity returns from 2000 to 2002 and from 2007 to 2009, along with low interest rates not seen since the 1960's. This recent volatility should be considered in setting the investment return for the future.

This volatility has resulted in the annual returns on the market value of assets exceeding the 7.5% assumed rate in 9 of the last 15 years, with an average return of 7.74% over that time period. The annual returns on the actuarial value of assets exceeded 7.5% in 7 of the last 15 years, with an average return of 6.72%. The average return on both the market and actuarial value exceeded 7.5% the last five years. In evaluating this assumption, strong consideration should be given to the current asset allocation mix, and future expectations of the returns on these asset classes, in setting the future investment return assumption.

We understand the System's investment consultant has recently evaluated the investment return assumption as part of an asset liability study. That evaluation included forward-looking analysis by the investment consultant and resulted in an expected rate of return in excess of 7.5%. Thus, we rely on the recommendation from the System and its investment consultant to retain the current investment return assumption of 7.5%.

### Salary Increases

The salary increase assumption will typically contain two components. The first component is the increase in general compensation directly related to inflation. The second component is the increase in individual compensation due to promotions, seniority and tenure, which has been commonly called merit.

The current salary increase assumption varies by age beginning at 15.11% at age 20 and decreasing to 4.50% at age 45 and thereafter. The expected weighted average salary increase reflecting the active member age distribution for the most recent year is 5.38%.

For the ten-year period from July 1, 2007 to June 30, 2017, actual salaries paid in the prior year were reported. Because of the similar reporting, this gives creditability to assess actual salary increase experience over the ten-year period. The display below reports the annual salary increases for the ten-year period from July 1, 2007 to June 30, 2017 compared to the expected increases:

<u>Ages</u>	<u>Actual Weighted Salary Increases</u>	<u>Expected Weighted Salary Increases</u>
20-24	11.99%	12.22%
25-29	8.03	8.74
30-34	5.80	6.20
35-39	4.75	5.21
40-44	4.21	4.75
45-49	4.01	4.50
50-54	3.64	4.50
55-59	3.73	4.50
60-64	3.81	4.50
Weighted Average	4.86%	5.38%

## Summary of Results – Economic Assumptions

As a measure to compare the general observed salary increases against the actuarially assumed salary increases, we reviewed the National Average Wage increase assembled by the Social Security System and also the Consumer Price Index (CPI). It should be noted that for the ten-year period ending in 2016 (most recent year available) the National Average Wage increase, as reported by the Social Security System, has been 2.33% compounded per year. In addition, for the ten-year period ending June 30, 2017, the actual CPI for the Midwest area on all items increased 1.63% compounded per year. Indeed, the most recent 10 years have, in general, been a relatively low inflationary period in historical terms.

Actual salary increases have been lower than the expected increases over all age groups. In particular, salary increases for the age group 20-24 have been just slightly lower than those expected, but for other age groups such as the age group 50-54, salary increases have been significantly lower than those expected. We suggest to evaluate decreasing the annual salary increase for all age groups except for the age group 20-24 if this is expected to continue. This may result in a decrease in assumed salary increases for all ages over 24 with emphasis to obtain an expected weighted average increase of no more than 4.00% for all age groups over 45.



## Summary of Results – Demographic Assumptions

### Demographic Assumptions

Demographic assumptions are those assumptions related to the specific experience of the individual members of the System. The purpose of the demographic experience analysis is to compare what actually occurred to the individual members of the System during the ten-year period ending June 30, 2017, with what was expected to occur based on the actuarial assumptions. A ten-year period is a relatively reasonable observation period for purposes of experience studies, although the size of the System may not be large enough to justify changing actuarial assumptions where there is insufficient data in terms of numbers, or creditability, to rely on (for example deaths among active members occur very infrequently to substantiate actual experience in some cases).

To prepare a demographic experience study, generally these steps are required:

- The numbers of members who actually decremented (such as retired, died, etc...) during the time period is summarized by age group.
- The number of members who are expected to decrement based on the actual census at each valuation date and current actuarial assumptions during the time period is summarized by the same age group.
- The ratio of actual decrements is compared to the number of expected decrements. This ratio, when greater than 1, indicates more decrements occurred than expected and vice versa.

If the actual experience differs significantly from the expected experience, or if the distribution of actual decrements by age differs significantly from the expected distribution, consideration of changing the actuarial assumptions is warranted. If any actuarial assumption is considered to be changed, recognition of future anticipated experience should also be a significant factor since past trends and experience may not be a pattern of future events. The demographic assumptions studied included:

- Active Withdrawals
- Active Disabilities (Ordinary and Accidental)
- Active Service Retirements
- Active Deaths (Ordinary and Accidental)
- Active DROP (Participation and Premature Withdrawal)
- Inactive Deaths (Service Retirements, Beneficiaries, Disabilities)

## Summary of Results – Demographic Assumptions

The following display summarizes actual and expected rates of withdrawal, disability, retirement and death from July 1, 2007 to June 30, 2017. Additional detail for each decrement and each year in the ten-year period is shown in the Appendix.

<u>Decrement</u>	<u>Actual Number</u>	<u>Expected Number</u>	<u>Actual to Expected Ratio</u>
Active Withdrawals	777	743	1.05
Active Disabilities			
Ordinary	64	69	0.93
Accidental	270	329	0.82
Active Service Retirements	387	492	0.79
Active Deaths			
Ordinary	11	25	0.44
Accidental	16	10	1.60
Active DROP			
Participation	390	751	0.52
Premature Withdrawal	57	57	1.00
Inactive Deaths			
Service Retirements	489	508	0.96
Beneficiaries	493	512	0.96
Disabilities	265	277	0.96

The expected number of decrements in the ten-year period has been determined based on the assumptions used in the most recently completed actuarial valuation of July 1, 2017. This includes adjustments in assumed service retirement rates, assumed disability retirement rates, assumed active death rates and recognition of the several changes in inactive mortality assumption occurring over the ten-year period ending June 30, 2017.

### Active Withdrawals

The active withdrawal assumption applies to terminations of employment other than death, retirement or disability. The current withdrawal assumption is very modest and varies by age assuming higher rates at younger ages (about 58 per 1,000 members per year at age 25) than older ages (about 2 per 1,000 members per year at age 50). Actual withdrawals for reasons other than death, retirement and disability in the aggregate were slightly higher than expected. Interestingly, fewer withdrawals at the younger ages up to age 35 were observed when compared to expected. Also, more withdrawals at the older ages above 35 were observed when compared to expected. We suggest to evaluate increasing the withdrawal assumption for ages 40 and older to reflect past experience and future expectations.

## Summary of Results – Demographic Assumptions

### Active Disabilities

The current disability assumption is based on age and depends on if the disability is accidental or ordinary. Higher incidences of accidental disability are assumed as compared to ordinary disability.

Actual disabilities in the aggregate were lower than expected. Ordinary disabilities occurred much less frequently than accidental disabilities and were closer to those expected as compared to accidental disabilities over this ten-year period. It is important to note the incidences of disabilities has moderated recently, particularly over the last several years. In particular, the number of accidental disabilities has been significantly lower than expected for the past four years. Based on the experience of the group, we suggest to evaluate slightly decreasing the assumed ordinary disability rates at each age and to more significantly decrease the assumed accidental disability rates at the older ages above 45.

### Active Service Retirements

The current service retirement assumption has been in place since the July 1, 2013 valuation. The eligibility for service retirement is age 55, with at least 22 years of service, and the member is then eligible for unreduced benefits. In addition, a vested retirement is eligible for benefits beginning at age 55 with at least 4 years of service. Generally, higher rates of retirement are assumed for ages 55 and 56 (50% for age 55 and 25% for age 56) since most members are eligible for service retirement by age 55.

Actual retirements were fewer than expected retirements, except at age 55 in which actual retirements exceeded expected retirements. We suggest to evaluate increasing the assumed rate of retirement at age 55 and lowering the rates of retirement at ages 56-64.

### Active Deaths

The mortality assumption for active member deaths predicts eligibility for death benefits of active members prior to disability or retirement. This assumption currently is an age graded table not based on a specific published mortality table. Active member deaths observed over the ten-year period were less than expected. However, the number of ordinary deaths has been significantly lower than expected, while the number of accidental deaths has been significantly higher than expected. We suggest to evaluate lowering active member ordinary mortality rates and increasing active member accidental mortality rates.

### Active DROP

The current DROP participation and premature withdrawal assumptions have been in place since the July 1, 2007 actuarial valuation. The current DROP participation assumption anticipates an active member will elect to participate in DROP when first eligible. In addition, once a member participates in DROP, a modest number of those members are assumed to prematurely withdraw from DROP before completing the elected period of time.

The number of premature withdrawals from DROP has been equal to what was expected. We do not suggest to evaluate any change in the DROP premature withdrawal assumption.

## Summary of Results – Demographic Assumptions

Actual participation in DROP has been significantly less than expected. It is important to note the incidences of active members electing to participate in DROP further slightly decreased recently over the past four years. In addition, the ages of 55 and 56 have been observed to have significantly lower participation rates than expected. Due to the observed experience and future expectations, we currently suggest evaluating a decrease in the active DROP participation assumption for ages 55 and 56.

### Inactive Deaths

One of the most important demographic assumptions is mortality for inactive members receiving benefits, since this assumption predicts when benefit payments cease. Based on published reports by the federal government, it has been observed that rates of mortality have declined over the past 70 years, resulting in increasing life expectancies across all sections of the U.S. population. However, the rate of decline in rates of mortality has slowed significantly in the past 10 years. The mortality assumption is based on assumed rates of mortality at each age and by gender. In addition, different rates are used for disabled retirements.

The mortality assumption for inactive members is currently based on the RP 2000 Blue Collar Combined Healthy Mortality Table with males set back two years and females set forward one year. Due to lower assumed life expectancies, a one-year set forward and male only rates are used for disabled retirees since this group is expected not to live as long as healthy members. For inactive members, the actual number of deaths in the aggregate has been lower than expected primarily due to fewer deaths in the last two years. In particular, the actual number of service retirement deaths is lower (about 3.7% fewer) than the expected number of service retirement deaths. The number of actual beneficiary deaths is also lower (about 3.7% fewer) than the expected number of beneficiary deaths. Finally, the actual number of deaths for disabled retirees is lower (about 4.3% fewer) than the expected number of disabled deaths. As noted below, we suggest evaluating the inactive mortality assumption so there is some margin with actual deaths exceeding expected deaths.

The Retirement Plans Experience Committee (RPEC) of the Society of Actuaries (SOA) is currently working on a public pension mortality study which is expected to result in separate mortality tables applicable to public pension systems. The most recent update on this process from RPEC and SOA is that they are expected to issue an exposure draft report on this study in 2018. After a three- to four-month exposure period, the final report is expected to be published in late 2018.

Even though the final report of the public pension mortality study and tables may be published after the completion of the next scheduled actuarial valuation as of July 1, 2018, we suggest to evaluate an alternative mortality assumption for service retirements, beneficiaries and disabled retirements by changing to the RP 2014 Blue Collar Healthy Annuitant Mortality Table and modifying the set back and set forward to reflect mortality experience of the System through the last date of this experience study of June 30, 2017, with some margin for adverse experience. Further, this assumption should be further assessed once the public pension mortality tables are available.

## **Summary of Results – Demographic Assumptions**

### **Future Mortality Improvement Assumption**

The actuarial assumptions typically also include a future mortality improvement assumption. Currently, a five-year projection of future mortality improvement using Scale BB (an improvement scale published by the SOA) is assumed. Actual long-term past experience of the System indicates there has been some evidence of mortality improvement. Research of larger population databases has generally concluded that rates of mortality improvement for U.S. adult populations have generally improved over the past several decades but also indicates a reduction in mortality improvement, and for some demographic subgroups no mortality improvement, over the past four years.

Based on long-term expectations that some rate of further future mortality improvement would be considered reasonable for the System's inactive members, we suggest to evaluate an increase in the years of projection of future mortality improvement or change to a generational projection of future mortality improvement.

## Appendix

### Comparison of Actual to Expected Decrements

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active Annual Salary Increases

Ages	Actual Salary Increases											Actual Average Rate	Expected Average Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17	Average			
20-24	13.01%	12.00%	12.10%	10.37%	12.83%	10.97%	11.93%	11.18%	11.88%	13.63%	11.99%	11.99%	12.22%	0.98
25-29	8.80%	8.85%	8.69%	6.61%	9.61%	5.45%	7.15%	7.35%	8.94%	8.82%	8.03%	8.03%	8.74%	0.92
30-34	6.65%	6.64%	6.41%	4.89%	7.32%	3.04%	5.11%	5.55%	5.95%	6.46%	5.80%	5.80%	6.20%	0.93
35-39	5.47%	5.49%	5.35%	4.05%	6.30%	1.77%	4.11%	4.14%	5.08%	5.74%	4.75%	4.75%	5.21%	0.91
40-44	5.03%	5.07%	5.22%	3.63%	5.74%	1.10%	3.41%	3.73%	4.08%	5.07%	4.21%	4.21%	4.75%	0.89
45-49	4.86%	4.53%	4.39%	3.65%	5.38%	1.42%	3.14%	3.69%	4.16%	4.92%	4.01%	4.01%	4.50%	0.89
50-54	4.48%	4.45%	4.48%	2.75%	4.95%	0.66%	2.81%	3.42%	3.85%	4.60%	3.64%	3.64%	4.50%	0.81
55-59	4.40%	4.18%	4.47%	3.23%	4.31%	1.72%	3.43%	3.35%	3.76%	4.49%	3.73%	3.73%	4.50%	0.83
60-64	3.26%	3.47%	3.89%	3.55%	4.53%	3.22%	3.94%	3.52%	4.09%	4.60%	3.81%	3.81%	4.50%	0.85
<b>Actual Weighted Average</b>	5.70%	5.62%	5.60%	4.15%	6.27%	2.10%	4.11%	4.40%	5.00%	5.68%	4.86%	4.86%		
<b>Expected Weighted Average</b>	5.51%	5.52%	5.50%	5.48%	5.46%	5.41%	5.40%	5.38%	5.36%	5.38%	5.44%		5.38%	0.90

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active Withdrawals

Ages	Number of Withdrawals										Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17				
20-24	7	11	5	1	3	7	5	5	2	10	56	0.0617	0.0659	0.94
25-29	25	14	18	14	15	22	21	16	20	21	186	0.0413	0.0529	0.78
30-34	21	13	13	15	14	17	22	28	26	25	194	0.0312	0.0379	0.82
35-39	15	13	10	16	10	22	11	14	12	16	139	0.0207	0.0205	1.01
40-44	17	11	4	9	6	8	6	7	10	10	88	0.0132	0.0087	1.52
45-49	5	5	6	4	10	10	6	3	8	6	63	0.0109	0.0020	5.45
50-54	5	5	1	2	3	5	2	2	4	6	35	0.0073	0.0020	3.65
55-59	0	0	0	1	0	0	1	2	1	3	8	0.0031	0.0000	1.00
60-64	0	0	0	0	0	0	1	3	1	0	5	0.0070	0.0000	1.00
65+	0	0	0	0	0	0	2	0	0	1	3	0.0882	0.0000	1.00
<b>Total Actual</b>	95	72	57	62	61	91	77	80	84	98	777	0.0200		
<b>Total Expected</b>	77	78	77	75	75	73	73	72	71	72	743		0.0191	1.05



## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active Ordinary Disability Retirements

Ages	Number of Ordinary Disability Retirements											Actual Rate	Expected Rate	Ratio of Actual to Expected	
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17	Total				
20-24	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0008	0.00
25-29	0	0	0	2	0	0	0	0	1	0	3	3	0.0007	0.0008	0.88
30-34	1	0	0	0	1	1	0	1	2	0	6	6	0.0010	0.0008	1.25
35-39	0	0	1	0	2	1	1	2	0	1	8	8	0.0012	0.0011	1.09
40-44	0	1	1	2	0	1	0	1	3	3	12	12	0.0018	0.0015	1.20
45-49	0	1	0	0	1	1	1	1	2	2	9	9	0.0016	0.0020	0.80
50-54	1	4	0	1	3	1	3	1	1	1	16	16	0.0033	0.0026	1.27
55-59	1	1	0	3	0	0	0	1	1	0	7	7	0.0027	0.0048	0.56
60-64	1	0	0	0	0	1	0	0	0	1	3	3	0.0042	0.0099	0.42
65+	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0145	0.00
<b>Total Actual</b>	<b>4</b>	<b>7</b>	<b>2</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>7</b>	<b>10</b>	<b>8</b>	<b>64</b>	<b>0.0016</b>			
<b>Total Expected</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>69</b>		<b>0.0018</b>	<b>0.93</b>	

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active Accidental Disability Retirements

Ages	Number of Accidental Disability Retirements										Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17				
20-24	0	0	0	0	0	1	0	0	0	0	1	0.0011	0.0010	1.10
25-29	1	0	0	0	0	0	0	1	0	0	2	0.0004	0.0010	0.40
30-34	0	2	1	0	2	1	2	0	1	1	10	0.0016	0.0010	1.60
35-39	1	3	3	6	0	2	3	4	4	3	29	0.0043	0.0017	2.53
40-44	3	5	1	2	3	4	4	2	4	1	29	0.0044	0.0041	1.07
45-49	4	5	0	6	6	3	1	6	3	5	39	0.0068	0.0080	0.85
50-54	13	10	6	8	7	8	4	6	7	6	75	0.0156	0.0224	0.70
55-59	5	4	6	2	5	7	3	4	6	4	46	0.0179	0.0344	0.52
60-64	2	3	3	4	4	6	4	4	2	5	37	0.0515	0.0621	0.83
65+	0	0	0	1	0	0	0	0	0	1	2	0.0588	0.0641	0.92
<b>Total Actual</b>	29	32	20	29	27	32	21	27	27	26	270	0.0069		
<b>Total Expected</b>	31	31	32	33	33	33	33	34	34	35	329		0.0085	0.82

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active Service Retirements

Ages	Number of Service Retirements										Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17				
55	36	22	31	20	33	22	10	18	16	21	229	0.6515	0.5000	1.30
56	7	12	8	4	6	5	4	7	2	7	62	0.1314	0.2500	0.53
57	4	4	2	1	5	4	2	5	1	3	31	0.0960	0.2000	0.48
58	2	2	1	2	1	2	1	0	3	1	15	0.0898	0.2000	0.45
59	2	3	1	0	2	3	0	0	1	0	12	0.1034	0.2000	0.52
60	1	1	0	2	1	1	1	0	0	2	9	0.1098	0.2000	0.55
61	0	0	1	2	0	1	0	0	0	0	4	0.0625	0.2500	0.25
62	1	0	0	0	0	1	0	0	1	1	4	0.0976	0.3000	0.33
63	2	2	0	0	1	1	0	0	0	2	8	0.2759	0.3500	0.79
64	0	0	0	1	0	1	0	2	0	1	5	0.2941	0.4000	0.74
65+	0	0	0	0	2	2	1	2	0	1	8	0.5714	1.0000	0.28
<b>Total Actual</b>	55	46	44	32	51	43	19	34	24	39	387	0.2308		
<b>Total Expected</b>	48	47	51	48	49	45	42	50	54	58	492		0.2935	0.79

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active Ordinary Deaths

Ages	Number of Ordinary Deaths										Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17				
20-24	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0002	0.00
25-29	1	0	0	0	0	0	0	0	0	0	1	0.0002	0.0003	0.67
30-34	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0003	0.00
35-39	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0004	0.00
40-44	1	0	0	0	0	0	0	1	1	0	3	0.0005	0.0006	0.83
45-49	0	0	0	0	0	0	1	1	0	0	2	0.0003	0.0008	0.38
50-54	0	3	0	0	1	0	0	0	0	1	5	0.0010	0.0011	0.91
55-59	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0015	0.00
60-64	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0022	0.00
65+	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0025	0.00
<b>Total Actual</b>	2	3	0	0	1	0	1	2	1	1	11	0.0003		
<b>Total Expected</b>	2	2	2	2	3	3	2	3	3	3	25		0.0006	0.44

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active Accidental Deaths

Ages	Number of Accidental Deaths										Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17				
20-24	0	0	0	0	0	0	0	0	0	1	1	0.0011	0.0002	5.50
25-29	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0001	0.00
30-34	0	0	0	0	0	0	0	0	2	0	2	0.0003	0.0001	3.00
35-39	0	0	0	0	0	0	0	1	2	1	4	0.0006	0.0001	6.00
40-44	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0001	0.00
45-49	1	0	0	0	1	0	2	0	0	1	5	0.0009	0.0003	3.00
50-54	0	0	1	0	0	0	0	0	0	1	2	0.0004	0.0007	0.57
55-59	0	0	0	0	0	0	1	0	1	0	2	0.0008	0.0011	0.73
60-64	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0019	0.00
65+	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0032	0.00
<b>Total Actual</b>	1	0	1	0	1	0	3	1	5	4	16	0.0004		
<b>Total Expected</b>	1	1	1	1	1	1	1	1	1	1	10		0.0003	1.60

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active DROP Participation

Ages	Number of Actives Elected DROP										Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17				
55	7	9	2	6	5	8	5	5	5	6	58	0.4113	1.0000	0.41
56	5	8	5	7	6	6	2	3	8	4	54	0.6136	1.0000	0.61
57	12	20	16	19	21	19	15	19	15	13	169	0.8711	1.0000	0.87
58	8	3	3	5	11	2	5	3	5	7	52	0.5652	1.0000	0.57
59	0	1	4	2	3	3	1	1	2	2	19	0.2676	1.0000	0.27
60	2	1	2	1	1	1	1	2	1	3	15	0.2542	1.0000	0.25
61	2	0	0	3	1	4	0	2	1	1	14	0.3415	1.0000	0.34
62	1	0	0	0	1	0	1	0	1	2	6	0.2069	1.0000	0.21
63	0	0	0	0	0	1	1	0	0	0	2	0.1111	1.0000	0.11
64	0	0	0	0	0	0	0	0	0	0	0	0.0000	1.0000	0.00
65+	0	1	0	0	0	0	0	0	0	0	1	0.1250	1.0000	0.13
<b>Total Actual</b>	37	43	32	43	49	44	31	35	38	38	390	0.5193		
<b>Total Expected</b>	91	95	76	73	81	73	62	67	62	71	751		1.0000	0.52

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Active DROP Premature Withdrawals

Ages	Number of Active DROP Premature Withdrawals											Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17					
55	0	2	0	1	1	0	0	0	0	1	5	0.2083	0.0500	4.17	
56	2	2	1	0	0	4	0	2	4	4	19	0.2676	0.0500	5.35	
57	3	0	0	2	2	0	0	1	1	3	12	0.0863	0.0500	1.73	
58	0	1	1	0	1	3	1	0	2	0	9	0.0393	0.0500	0.79	
59	1	0	1	1	0	0	0	0	2	0	5	0.0239	0.0500	0.48	
60	0	0	1	0	1	0	1	0	0	0	3	0.0171	0.0500	0.34	
61	1	0	0	0	0	0	0	0	1	0	2	0.0163	0.0500	0.33	
62	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0500	0.00	
63	0	0	0	0	0	0	1	0	0	0	1	0.0196	0.0500	0.39	
64	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0500	0.00	
65+	1	0	0	0	0	0	0	0	0	0	1	0.0500	0.0500	1.00	
<b>Total Actual</b>	<b>8</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>7</b>	<b>3</b>	<b>3</b>	<b>10</b>	<b>8</b>	<b>57</b>	<b>0.0492</b>			
<b>Total Expected</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>57</b>		<b>0.0492</b>	<b>1.00</b>	

## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Inactive Deaths for Service Retirements

Ages	Number of Deaths for Service Retirements										Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17				
55-59	3	3	3	4	2	1	1	0	1	0	18	0.0066	0.0044	1.50
60-64	6	3	3	2	3	2	1	1	3	3	27	0.0065	0.0084	0.77
65-69	3	2	7	2	3	5	3	3	4	5	37	0.0100	0.0158	0.63
70-74	4	7	2	7	3	8	4	7	7	3	52	0.0191	0.0268	0.71
75-79	8	9	4	5	5	10	10	17	8	10	86	0.0435	0.0436	1.00
80-84	6	9	7	7	14	6	8	14	8	8	87	0.0605	0.0715	0.85
85-89	9	9	8	12	10	16	12	18	8	12	114	0.1439	0.1160	1.24
90-94	5	6	4	4	8	5	3	3	7	11	56	0.2051	0.1816	1.13
95-99	3	0	1	1	1	2	2	1	0	1	12	0.3529	0.2628	1.34
<b>Total Actual</b>	47	48	39	44	49	55	44	64	46	53	489	0.0275		
<b>Total Expected</b>	44	45	46	48	50	52	53	55	56	59	508		0.0285	0.96



## Municipal Fire & Police Retirement System of Iowa Comparison of Actual to Expected Decrements

For July 1, 2007 to June 30, 2017

### Inactive Deaths for Beneficiaries

Ages	Number of Deaths for Beneficiaries											Actual Rate	Expected Rate	Ratio of Actual to Expected	
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17	Total				
<40	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0004	0.00
40-44	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0012	0.00
45-49	0	0	0	0	1	0	0	0	0	1	2	2	0.0148	0.0017	8.71
50-54	0	0	0	1	0	1	0	1	0	0	3	3	0.0138	0.0024	5.75
55-59	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	0.0039	0.00
60-64	0	0	1	0	1	0	1	2	0	1	6	6	0.0086	0.0080	1.08
65-69	6	5	2	1	1	2	0	2	1	2	22	22	0.0251	0.0150	1.67
70-74	7	1	1	4	1	6	6	2	1	2	31	31	0.0283	0.0257	1.10
75-79	9	1	6	5	3	5	3	5	8	5	50	50	0.0357	0.0409	0.87
80-84	5	9	6	6	12	8	13	13	7	7	86	86	0.0593	0.0678	0.87
85-89	10	12	5	10	12	15	10	10	16	8	108	108	0.0903	0.1139	0.79
90-94	13	6	9	16	10	16	9	13	9	12	113	113	0.1654	0.1713	0.97
95-99	10	4	6	7	5	5	10	9	6	10	72	72	0.2824	0.2227	1.27
<b>Total Actual</b>	<b>60</b>	<b>38</b>	<b>36</b>	<b>50</b>	<b>46</b>	<b>58</b>	<b>52</b>	<b>57</b>	<b>48</b>	<b>48</b>	<b>493</b>	<b>0.0546</b>			
<b>Total Expected</b>	<b>49</b>	<b>48</b>	<b>50</b>	<b>52</b>	<b>51</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>53</b>	<b>53</b>	<b>512</b>		<b>0.0567</b>	<b>0.96</b>	

**Municipal Fire & Police Retirement System of Iowa  
Comparison of Actual to Expected Decrements**

For July 1, 2007 to June 30, 2017

**Inactive Deaths for Disability Retirements**

Ages	Number of Deaths for Disability Retirements										Total	Actual Rate	Expected Rate	Ratio of Actual to Expected
	7/1/07 - 6/30/08	7/1/08 - 6/30/09	7/1/09 - 6/30/10	7/1/10 - 6/30/11	7/1/11 - 6/30/12	7/1/12 - 6/30/13	7/1/13 - 6/30/14	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17				
<40	0	0	1	0	0	0	0	0	0	0	1	0.0046	0.0008	5.75
40-44	0	0	0	1	0	0	0	0	0	0	1	0.0030	0.0016	1.88
45-49	1	0	0	1	0	0	1	0	0	0	3	0.0056	0.0021	2.67
50-54	0	1	1	0	0	1	2	0	0	0	5	0.0052	0.0034	1.53
55-59	2	1	0	2	1	0	2	1	2	1	12	0.0068	0.0065	1.05
60-64	5	4	4	2	3	3	3	8	2	2	36	0.0164	0.0124	1.32
65-69	4	2	1	2	6	1	7	1	1	4	29	0.0147	0.0219	0.67
70-74	3	5	2	3	10	4	5	3	4	10	49	0.0342	0.0358	0.96
75-79	2	6	4	2	8	7	4	5	12	5	55	0.0608	0.0586	1.04
80-84	6	2	2	3	3	2	2	7	2	5	34	0.0719	0.0959	0.75
85-89	4	0	4	2	5	3	0	6	3	1	28	0.1522	0.1530	0.99
90-94	0	2	1	1	0	1	1	3	0	2	11	0.1833	0.2276	0.81
95-99	1	0	0	0	0	0	0	0	0	0	1	0.0833	0.3148	0.26
<b>Total Actual</b>	<b>28</b>	<b>23</b>	<b>20</b>	<b>19</b>	<b>36</b>	<b>22</b>	<b>27</b>	<b>34</b>	<b>26</b>	<b>30</b>	<b>265</b>	<b>0.0240</b>		
<b>Total Expected</b>	<b>23</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>32</b>	<b>32</b>	<b>34</b>	<b>277</b>		<b>0.0251</b>	<b>0.96</b>