Cavanaugh Macdonald
CONSULTING, LLC
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Iowa Public Employees' Retirement System

Experience Study

Presented: June 16, 2022

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June 16, 2022

Investment Board
Iowa Public Employees' Retirement System
7401 Register Drive
Des Moines, IA 50321

Dear Trustees:

It is a pleasure to submit this report of our investigation of the experience of the Iowa Public Employees' Retirement System for the period of July 1, 2017 through June 30, 2021. The results of the experience study are the basis for recommended changes to the actuarial assumptions. The set of assumptions proposed as a result of this study will be used in the June 30, 2022 actuarial valuation of IPERS to analyze the funding status of the system, calculate the actuarial and required contribution rates, and disclose employer liabilities for financial statements.

The purpose of this report is to communicate the results of our review of the actuarial methods and assumptions to be used in the completion of the upcoming valuation. Our recommendations represent changes from the prior methods or assumptions, which are intended to better anticipate the emerging experience of the System. Actual future experience, however, may still differ from these assumptions.

In preparing this report, we relied without audit on information supplied by IPERS staff. In our examination, we have found the data to be reasonably consistent and comparable with data used for other purposes. It should be noted that if any data or other information is inaccurate or incomplete, our calculations and recommendations might need to be revised. We would like to acknowledge the help given by IPERS staff in the preparation of this report.

We hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board (ASB) and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.

We further certify that the assumptions developed in this report satisfy ASB Standards of Practice, in particular, No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* and No. 35, *Selection of Demographic and Other Non-economic Assumptions for Measuring Pension Obligations*.

In order to prepare the results in this report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results. 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; 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.

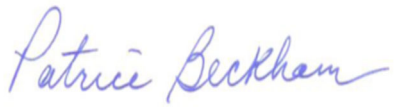
We look forward to our discussions and the opportunity to respond to your questions and comments.

I, Patrice A. Beckham, am a member of the American Academy of Actuaries, an Enrolled Actuary and a Fellow of the Society of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I, Brent A. Banister, am a member of the American Academy of Actuaries, an Enrolled Actuary and a Fellow of the Society of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I, Bryan K. Hoge, am a member of the American Academy of Actuaries, an Enrolled Actuary and a Fellow of the Society of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,



Patrice A. Beckham, FSA, FCA, EA, MAAA
Principal and Consulting Actuary

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Bryan K. Hoge, FSA, FCA, EA, MAAA
Consulting Actuary

The purpose of an actuarial valuation is to provide a timely best estimate of the ultimate costs of a retirement system. Actuarial valuations of the Iowa Public Employees' Retirement System (IPERS) are prepared annually to determine the actuarial contribution rate to fund the System on an actuarial basis, i.e., the current assets plus future contributions along with investment earnings will be sufficient to provide the benefits promised by the System to current members. The valuation requires the use of certain assumptions with respect to the occurrence of future events, such as rates of death, termination of employment, retirement age and salary changes, to estimate the obligations of the System.

The basic purpose of an experience study is to determine whether the actuarial assumptions currently in use are accurately predicting actual emerging experience. This information, along with the professional judgment of System personnel and advisors, is used to evaluate the appropriateness of continued use of the current actuarial assumptions. When analyzing experience and assumptions, it is important to realize that actual experience is reported short term while assumptions are intended to be long term estimates of experience.

IPERS conducts an experience study every four years. This study covers the economic and demographic assumptions along with the actuarial methods used in the valuation process. The study period is July 1, 2017 through June 30, 2021.

There are three distinct membership groups in IPERS, with different applicable plan provisions and contribution rates:

- Regular Members,
- Sheriff and Deputy Sheriffs, and
- Protection Occupation.

The benefit provisions for the Sheriffs and Deputies and Protection Occupation groups are very similar and the size of both groups is relatively small. Therefore, for purposes of analyzing experience, the data for these groups has been aggregated when reasonable to do so. Results are shown separately for Regular members (which includes State, Schools and Other public employers) and Special Service members (Sheriffs/Deputies and Protection Occupation) in the discussion of demographic assumptions.

As was noted in the 2013 and 2017 experience studies, several changes in benefits provisions for Regular members were passed in the 2010 legislative session and were effective July 1, 2012. Because these changes were prospective in nature, they had minimal impact on the amount of benefit or the eligibility for receiving a benefit for anyone during that study period. As the effects of these changes become larger and affect more members, we are inherently reflecting any behavior changes from these provisions gradually.

ACTUARIAL METHODS

Together the actuarial cost method, the asset valuation method and the amortization of the unfunded actuarial liability (UAL) create the cornerstone of the System's funding policy. During calendar year 2013, a special study of the current funding policy for IPERS was performed and each key factor was thoroughly discussed, reviewed, and analyzed. The result of these efforts was a revision of two documents by the Investment Board in September, 2013: (1) Actuarial Amortization Policy and (2) Contribution Rate Funding Policy. Changes were made to meet the competing goals of stabilizing contribution rates and improving IPERS' long-term funding as quickly as possible. Please see Appendix A for a copy of IPERS' Contribution Rate Funding Policy**.**

There are three key actuarial methods that are required to complete the annual actuarial valuation. The current methods are shown below:

Actuarial Cost Method:	Entry Age Normal
Asset Valuation Method:	75% Expected Value + 25% Actual Market Value with an 80% to 120% corridor around market value
Amortization Method:	Level Percent of Payroll with the June 30, 2014 UAL amortized over a closed 30-year period and subsequent changes in the UAL amortized over a closed 20-year period beginning on the date the base is established. The amortization period for changes in the UAL for plan amendments and assumption changes will be determined at the time they occur.

We are not recommending any changes to these methods.

ACTUARIAL ASSUMPTIONS

The actuarial valuation process utilizes two different types of assumptions: economic and demographic. Economic assumptions are related to the general economy and its impact on IPERS. Demographic assumptions are based on the emergence of the specific experience of IPERS members.

Economic Assumptions

The following table summarizes the current and proposed economic assumptions. Note that we are recommending only one potential change.

	Current Assumptions	Proposed Assumptions
Price Inflation	2.60%	2.60%
Investment Return	7.00%	6.75% - 7.00%
Interest on Member Accounts	3.50%	3.50%
Wage Growth	3.25%	3.25%
Payroll Growth	3.25%	3.25%

Demographic Assumptions

We generally analyzed experience for each of the four years individually as well as in aggregate. If any of the experience in certain years seemed out of line, the credibility of that experience was reduced in evaluating the current assumptions and proposing changes. A portion of this study was during the Covid-19 pandemic, and so we are aware that the behavior and experiences of the members during this period could be affected. Based on our review of data on a year-by-year basis and our familiarity with other retirement systems, especially in the Midwest, we do not believe that there was much impact on IPERS membership. However, our recommendations for changes were influenced by this awareness.

In the analysis of demographic experience, we use a methodology for analyzing the experience, called a "liability-weighted" approach (referred to in this report as "weighted"). A member's "liability" in the System is generally determined by the benefit amount and age of the member. Many assumptions already reflect differences by age directly. The other factor, benefit amount, is impacted by salary and service. We use these two factors to estimate the member's relative benefit level and then weight the experience (the exposure and actual occurrences are scaled by salary and service). This approach is particularly insightful when analyzing experience from a non-homogenous group. While we reviewed experience on both a count and liability-weighted basis for most decrements, we generally gave the liability-weighted experience more credibility in proposing changes. This is discussed in each section of the demographic assumptions in this report.

Our recommended changes to the demographic assumptions are intended to better reflect future experience and improve the calculation of future liabilities. The specific changes are discussed below:

Mortality: In general, mortality rates continue to improve, largely as expected. We are recommending moving to the family of Pub-2010 Mortality Tables for all groups, with adjustments and scaling as needed to ensure the fit is reasonable. The Pub-2010 Tables, including the mortality improvement scales, are the recently published first ever mortality tables for use in public pension valuations. The recommended changes impact the mortality assumption used for active members, disabled members and in-pay members.

Retirement: Based on trends observed in the current and prior experience studies, we are recommending some fairly minor adjustments to retirement rates for Regular members. We are not recommending any changes to the retirement rates for the Sheriffs and Deputies and Protection Occupation groups.

Disability: For all Regular membership groups (State, School, Other), the disability rates are being lowered. The adjustments for the Regular membership were based on the experience in the current and prior studies. For the Sheriffs and Deputies, and Protection Occupation groups, we recommend retaining the current rates.

Termination of Employment: Based on the actual experience observed in the current study, we are recommending modest changes to this assumption for State members and Other male members. These adjustments continue to be made on the basis of trying to move part way and reflect the trends in multiple studies, where meaningful. For the two Special Service groups, we introduced separate duration-based assumptions for each group last time and recommend some refinements based on the additional observations in this period.

Election of Deferred Benefit: Overall, the current assumptions are reasonably anticipating the behavior of members who terminate employment and elect to leave their contributions with the System and draw a monthly benefit when eligible. We recommend no changes to this assumption.

Merit Salary Scale: This assumption is used, in conjunction with the general wage growth assumption (an economic assumption), to develop the individual salary increase assumption. The general shape of the merit scale is a good fit to the observed experience. We are not recommending any adjustments to the merit scale at this time.

OPTIONAL FORM FACTORS

A retiring member may elect the form of payment for his monthly benefit: e.g., single life annuity, joint and survivor annuity, life with 10 years guaranteed, etc. These different types of forms of payments are called optional forms. Optional form factors are used to convert the benefit amount for one form of benefit payment to another on an actuarial equivalent basis (i.e., no gain or loss to the System). These factors were last updated in 2018. The updated mortality table proposed in this study could be used to prepare new factors, although we do not believe the new table is so different as to require a change. If the discount rate is reduced, we would encourage IPERS to update the factors.

COST IMPACT

The estimated financial impact of the proposed changes, as based on June 30, 2021 valuation results, is summarized in the following table. Assumption changes only impact the liabilities and the normal cost rate. Assets are unaffected. The impact on the June 30, 2022 valuation results (actuarial liability and normal cost rate) should be similar, as a percent, but the dollar amount of impact will vary with the change in the underlying actuarial liability amount. The results presented show two asset return assumptions – one at the high end of the recommended range and the other at the low end. We have also included the direct recognition of the administrative expense, rather than reduce the expected return to implicitly reflect the expense.

The Actuarial Amortization Policy (Appendix B) gives the Board discretion in determining the period over which to amortize the change in liability from adopting these assumptions. The change in the actuarial liability resulting from the new set of economic assumptions adopted by the Board last study period was amortized over 20 years. Therefore, we have utilized a 20-year amortization period in determining the estimated cost of these assumption changes, but the Board may choose a different amortization period, if desired.

Estimated Change in Actuarial Liability and Costs
Based on June 30, 2021 Valuation

	Before Change	After Change (6.75%)	After Change (7.00)%
Regular Membership			
Actuarial Liability ($M)	$39,778	$40,913	$39,785
Actuarial Assets ($M)	34,735	34,735	34,735
Unfunded Actuarial Liability ($M)	$ 5,043	$ 6,179	$ 5,050
Normal Cost Rate	10.49%	11.23%	10.59%
Amortization Rate	3.65%	4.58%	3.67%
Administrative Expense	N/A	0.16%	0.16%
Actuarial Contribution Rate	14.14%	15.97%	14.42%
Sheriffs and Deputies Membership			
Actuarial Liability ($M)	$816.7	$830.5	$807.2
Actuarial Assets ($M)	839.0	839.0	839.0
Unfunded Actuarial Liability ($M)	$(22.3)	$ (8.5)	$(31.8)
Normal Cost Rate	16.93%	17.78%	16.77%
Amortization Rate	0.00%	0.00%	0.00%
Administrative Expense	N/A	0.16%	0.16%
Actuarial Contribution Rate	16.93%	17.94%	16.93%
Protection Occupation Membership			
Actuarial Liability ($M)	$1,950	$1,976	$1,919
Actuarial Assets ($M)	2,011	2,011	2,011
Unfunded Actuarial Liability ($M)	$ (61)	$ (36)	$ (92)
Normal Cost Rate	15.30%	16.16%	15.29%
Amortization Rate	0.00%	0.00%	0.00%
Administrative Expense	N/A	0.16%	0.16%
Actuarial Contribution Rate	15.30%	16.32%	15.45%

Note: Numbers may not add due to rounding.

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Funding and Valuation Principles

Just as certain investment choices have an associated "investment risk," choices in actuarial assumptions have an associated "actuarial risk". Our responsibility is to consider the impact our work will have on members, employers, and taxpayers, both current and future.

The determination of the actuarial contribution rate is dependent on the assumptions used to project the future benefit payments and then discount them to obtain the present values. Thus, it is important that the Board understand the sensitivity of the actuarial calculations to the underlying assumptions.

- If actual experience shows that the assumptions overestimated the true cost of the plan, current taxpayers and public employees and employers may be required to bear a burden that rightfully belongs to future taxpayers.
- If actual experience shows that the assumptions underestimated the true costs, future taxpayers and future employees and employers may be required to bear a burden that rightfully belongs to the current taxpayers.

The actuarial assumptions do not impact the true cost of the plan benefits; however, they do impact how the financing and pre-funding of those retirement benefits takes place before the true costs can be determined. Therefore, a balanced approach that is neither overly conservative nor aggressive seems the most equitable to all impacted parties.

The actuarial assumptions are divided into two groups: economic and demographic. The economic assumptions must not only reflect IPERS' experience but also give greater consideration to the long-term expectation of future economic growth for the nation, as well as the global economy.

The non-economic, or demographic assumptions, are based on IPERS' actual experience, adjusted to reflect trends and historical experience. The demographic assumptions are much more dependent on the numerical results of the experience studies, but there is still subjectivity involved in evaluating the experience and proposing any changes. There is no "right" answer because the future is unknown. Differences of opinion among actuaries will occur based on each person's background, experience and outlook.

Overview

This report presents the results of an investigation of the recent actuarial demographic experience of IPERS. We will refer to this investigation as an experience study. Throughout this report, we refer to "current" and "proposed" actuarial assumptions. The current assumptions and methods are those used in the actuarial valuation of IPERS as of June 30, 2021. They were adopted by the Board based on IPERS' 2013-2017 Demographic Experience Study and IPERS' 2017 Economic Assumptions Study. The proposed assumptions are those we recommend for use in the valuation prepared as of June 30, 2022 and for subsequent valuations until further changes are made.

Section 3 of this report discusses our recommended economic assumptions while Section 4 covers the actuarial methods. Sections 5 through 11 of this report will show the results of our study of demographic assumptions. The exhibits are detailed comparisons between actual and expected events (death, retirement,

termination, etc.) on both the current and, if applicable, the proposed assumptions. The graphs are included in the Appendices for your reference.

Our Philosophy

Similar to an actuarial valuation, the numerical calculation of actual and expected experience is a fairly mechanical process. From one actuary to another, you would expect to see very little difference. However, the setting of assumptions is a different story, as it is more art than science. In this report, we at times propose revisions to the current assumptions. To better understand our thought process, here is a brief summary of our philosophy:

- **Don't overreact:** When we see significant changes in experience, we generally do not adjust our rates to reflect the entire difference. We will generally propose rates somewhere between the old rates and the new experience depending on the level of credibility assigned to the more recent data. If the experience during the next study shows the same result, we will probably recognize this trend at that point. On the other hand, if the experience returns closer to its prior level, we will not have overreacted, minimizing volatility in the actuarial contribution rates.
- **Anticipate Trends:** If there is an identified trend that is expected to continue, we believe that this should be recognized. An example of this is the retiree mortality assumption. Mortality rates have generally declined over the past century with advances in public health and medical techniques, and most actuaries reflect the expectation of this trend continuing in their selection of a mortality assumption.
- **Simplify:** In this report we describe what factor affects each assumption. In general, we attempt to identify which factors are most important and eliminate the ones that add complexity to the valuation without significantly improving accuracy.

Actuarial Standard of Practice Number 27: Selection of Economic Assumptions for Measuring Pension Obligations

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standard of Practice (ASOP) No. 27. Because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment.

ASOP 27 requires the actuary to select a "reasonable" assumption. For this purpose, an assumption is reasonable if it has the following characteristics:

a. it is appropriate for the purpose of the measurement;

b. it reflects the actuary's professional judgement;

c. it takes into account historical and current economic data that is relevant as of the measurement date;

d. it reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and

e. it has no significant bias (i.e., it is neither significantly optimistic nor pessimistic) except when provisions for adverse deviation or plan provisions that are difficult to measure are included.

With respect to relevant data, the standard recommends the actuary review appropriate recent and long-term historical economic data, but advises the actuary not to give undue weight to recent experience. Furthermore, it advises the actuary to consider that some historical economic data may not be appropriate for use in developing assumptions for future periods due to changes in the underlying environment. In addition, with respect to any particular valuation, each economic assumption should be consistent with all other economic assumptions over the measurement period.

ASOP 27 recognizes that economic data and analyses are available from a variety of sources, including representatives of the plan sponsor, investment advisors, economists, and other professionals. The actuary is permitted to incorporate the views of experts, but the selection or advice must reflect the actuary's professional judgment.

The standard also discusses a "range of reasonable assumptions" which in part states "the actuary should also recognize that different actuaries will apply professional judgment and may choose different reasonable assumptions. As a result, a range of reasonable assumptions may develop both for an individual actuary and across actuarial practice."

Actuarial Standard of Practice No. 35: Selection of Demographic Assumptions

Actuarial Standard of Practice No. 35 (ASOP 35) governs the selection of demographic and other non-economic assumptions for measuring pension obligations. *ASOP 35* states that the actuary should use professional judgment to estimate possible future outcomes based on past experience and future expectations, and select assumptions based upon application of that professional judgment. The actuary should select reasonable demographic assumptions in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

ASOP No. 35 Steps

The actuary should follow the following steps in selecting the demographic assumptions:

- Identify the Types of Assumptions. Types of demographic assumptions include but are not limited to retirement, mortality, termination of employment, disability, election of optional forms of payment, administrative expenses, family composition, and treatment of missing or incomplete data. The actuary should consider the purpose and nature of the measurement, the materiality of each assumption, and the characteristics of the covered group in determining which types of assumptions should be incorporated into the actuarial model.
- Consider the Relevant Assumption Universe. The relevant assumption universe includes experience studies or published tables based on the experience of other representative populations, the experience of the plan sponsor, the effects of plan design, and general trends.
- Consider the Assumption Format. The assumption format includes whether assumptions are based on parameters such as gender, age, service or calendar year. The actuary should consider the impact the

format may have on the results, the availability of relevant information, the potential to model anticipated plan experience, and the size of the covered population.

- Select the Specific Assumption. In selecting an assumption the actuary should consider the potential impact of future plan design changes as well as the factors listed above.
- Evaluate the Reasonableness of the Selected Assumption. The assumption should be expected to appropriately model the contingency being measured. The assumption should not be anticipated to produce significant actuarial gains or losses.

ASOP No. 35 General Considerations and Application

Each individual demographic assumption should satisfy the criteria of *ASOP 35*. In selecting demographic assumptions the actuary should also consider the internal consistency between the assumptions, materiality, cost effectiveness, and the combined effect of all assumptions. At each measurement date the actuary should consider whether the selected assumptions continue to be reasonable, but the actuary is not required to do a complete assumption study at each measurement date. In our opinion, the demographic assumptions proposed in this report have been developed in accordance with *ASOP 35*.

The economic assumptions for IPERS include price inflation, long-term investment return, interest crediting rate for member accounts, wage growth (the across-the-board portion of salary increases) and the covered payroll increase assumption. Unlike demographic assumptions, economic assumptions do not lend themselves to analysis largely on the basis of internal historical patterns because economic assumptions are impacted by external forces in the economy. The investment return and general wage increase assumptions are selected on the basis of expectations in an inflation-free environment and then increased by the long-term expectation for inflation, called the "building block" approach.

Sources of data considered in the analysis and selection of the economic assumptions included:

- The 2022 Social Security Trustees Report (June 2022)
- Future expectations of IPERS investment consultant, Wilshire Consulting
- Future expectations of other investment consultants
- U.S. Department of the Treasury bond rates
- Assumptions used by other large public retirement systems, based on the Public Fund Survey, published by the National Association of State Retirement Administrators (NASRA)
- Historical observations of price and wage growth statistics and investment returns

Price Inflation

Use in the Valuation: Future price inflation has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, general wage growth (which then impacts individual salary increases), and payroll growth.

Inflation also has a direct impact on the valuation results. The Iowa Code provides for a potential increase in the annual dividend for members who retired before July 1990. The maximum annual increase in the dividend is the lesser of 3.0% or the increase in the CPI-U, subject to certain certifications by the actuary. Therefore, the inflation assumption is used directly to develop the assumed increase in the annual dividend payments for this group of retirees. The law also provides that the interest rate credited on member contribution balances will be 1% above the rate credited on a one-year Certificate of Deposit (CD). Because the interest rate on a one-year CD is expected to be related to anticipated inflation, the inflation assumption also impacts the assumed rate of interest on member account balances.

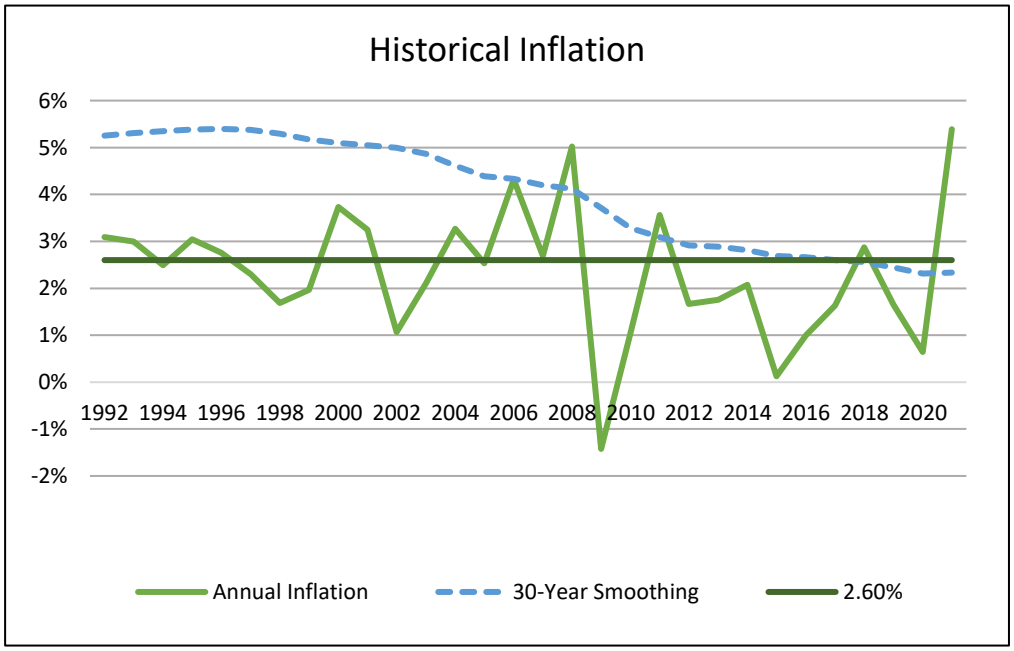
The long-term relationship between price inflation and investment return has long been recognized by economists. The basic principle is that the investor demands a more or less level "real return" – the excess of actual investment return over price inflation. If inflation rates are expected to be high, investment return rates are also expected to be high, while low inflation rates are expected to result in lower expected investment returns, at least in the long run.

The current assumption for price inflation is 2.60% per year which was recommended and adopted in the last experience study.

Past Experience: Although economic activities, in general, and inflation in particular, do not lend themselves to prediction solely on the basis of historical analysis, historical patterns and long-term trends are factors to be considered in developing the inflation assumption. The Consumer Price Index, US City Average, All Urban Consumers, CPI (U), has been used as the basis for reviewing historical levels of price inflation. The following table provides historical annualized rates of the CPI-U over periods ending December 31st.

Period	Number of Years	Annualized Rate of Inflation
1921 – 2021	100	2.82%
1961 – 2021	60	3.79
1971 – 2021	50	3.90
1981 – 2021	40	2.76
1991 – 2021	30	2.37
2001 – 2021	20	2.31
2011 - 2021	10	2.14

The following graph illustrates the historical annual change in price inflation, measured as of December 31 for each of the last 70 years, as well as the thirty-year rolling average.



Over more recent periods, measured from December 31, 2021, the average annual rate of increase in the CPI-U has been below the current assumption of 2.60%. The period of high inflation from 1973 to 1982 has a significant impact on the averages over periods which include these rates. While there has been a

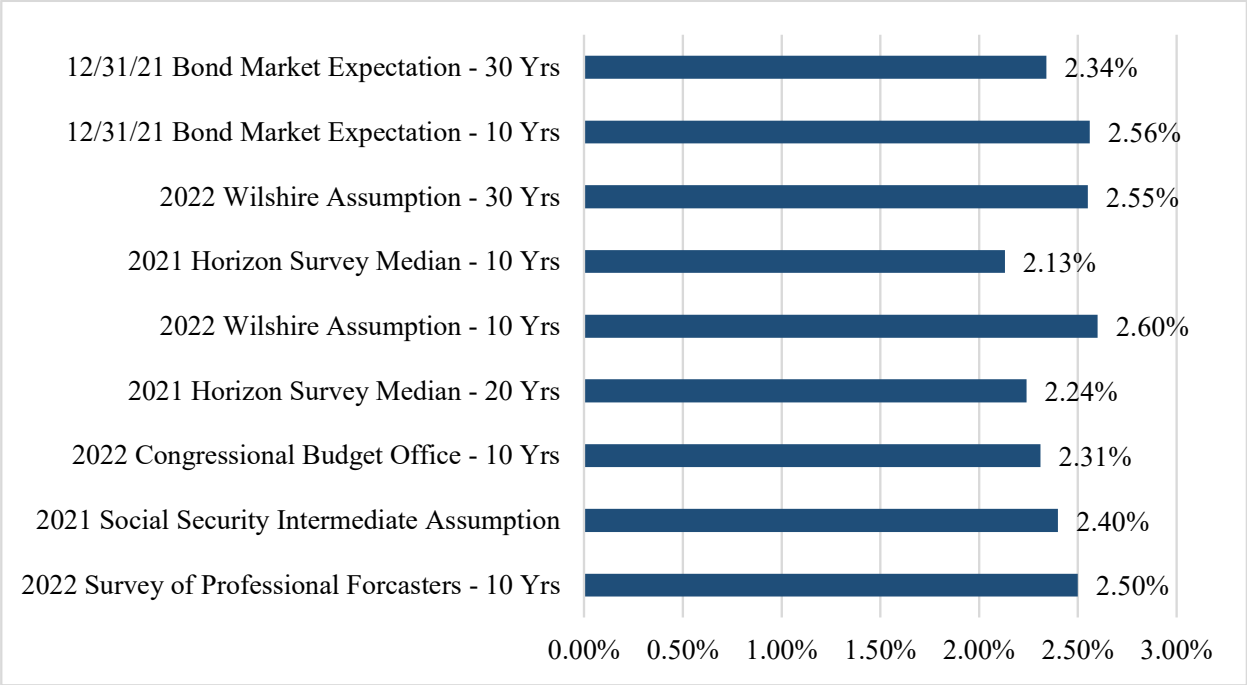
steady decline in inflation since that time, we note that 2021 is a clear exception. There are varying opinions as to the cause of the recent spike in inflation, but the current market pricing of Treasures and TIPS suggests that the financial markets currently anticipate to this phenomenon to last a few years at the most. At this point, it is difficult to determine what the recent increase tells us regarding long-term inflation.

Forecasts of Inflation

Additional information to consider in formulating this assumption is obtained from measuring the spread on Treasury Inflation Protected Securities (TIPS) and from the prevailing economic forecasts. The spread between the nominal yield on treasury securities (bonds) and the inflation indexed yield on TIPS of the same maturity is referred to as the "breakeven rate of inflation" and represents the bond market's expectation of inflation over the period to maturity. As of December 31, 2021, the market rate of inflation over the next 30 years was 2.34%. Current market prices as of March 2022 suggest that investors expect inflation to be around 3.6% over the next five years and 2.6% over the next 30 years. These rates have been volatile recently, making market pricing difficult to use for developing a long-term assumption.

IPERS' investment consultant, Wilshire, also has an inflation forecast in their capital market assumptions. Their first quarter 2022 short-term assumption (10 years) is 2.60% and their long-term assumption (30 years) is 2.55%. The Philadelphia Federal Reserve Survey of Professional Forecasters in the first quarter of 2022 indicated that inflation over the next ten years is expected to be 2.5%.

Other sources of forecasting information we considered include that of Wilshire, the IPERS investment consultant, the Horizon Actuarial Services survey of investment advisors, and the Congressional Budget Office. The following chart summarizes all of these forward-looking estimates.



Social Security Projections

Although many economists forecast lower inflation than the assumptions used by retirement systems, they are generally looking at a shorter time horizon (10 years) than is appropriate for a pension valuation. To consider a longer, similar time frame, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the most recent set of assumptions (June 2022), the projected average annual increase in the CPI over the next 75 years was estimated to be 2.4%, under the intermediate (best estimate) cost assumption. The range of price inflation used in the Social Security 75-year modeling, which includes a low- and high-cost scenario, in addition to the intermediate cost projection, was 1.8% to 3.0%.

Peer System Comparison

While we do not recommend the selection of any assumption based on what other systems use, it does provide another set of relevant information to consider. According to the Public Plan Database (a survey of over 130 state and local retirement systems maintained by a collaboration between the Center for Retirement Research at Boston College, the Center for State and Local Government Excellence, and the National Association of State Retirement Administrators) the average inflation assumption for statewide systems has been steadily declining. As of 2020, the average assumption is 2.59%, which is consistent with IPERS' current assumption.

Conclusion: The current inflation assumption is 2.60%, which was reduced by 0.40% in the last experience study. Actual inflation for the last 20-30 years has averaged less than 2.4% and rarely exceeded 3% in any year. However, since early 2021, inflation has increased sharply to levels not seen in decades. Actuarial standards caution against assigning too much weight to recent experience, and so we are hesitant to make any significant changes based on the high inflation in the last year. By the time the next experience study is performed, we should have a better sense of whether or not the recent high inflation is likely to be a long-term trend. Based on the information analyzed, **we recommend retaining the inflation assumption at 2.60%.**

Consumer Price Inflation	
Current Assumption	2.60%
Recommended Assumption	2.60%

RATE OF CREDITING INTEREST ON MEMBER CONTRIBUTION BALANCES

Use in the Valuation: Iowa law provides that the interest rate credited on member contribution balances will be 1% above the rate credited on a one-year Certificate of Deposit (CD). Because this rate impacts the dollar amount available for refund and the number of guaranteed payments at retirement under Option 2, an assumption is needed to project future member contribution balances. Note that this is a minor assumption that has a very small impact on the valuation results.

The current assumption is 3.50% (2.60% inflation plus 0.90%). The interest rate credited on Certificates of Deposit is directly impacted by inflation. Rates on short-term CDs tend to be somewhat similar to the long-term inflation rate. A review of recent experience shows that the interest rate credited has exceeded inflation by just under 1.0% per year, in line with the current assumption.

Year	Interest Rate Credited on Member Accounts	Actual Inflation	Difference
2007	5.79%	2.85%	2.94%
2008	5.33%	3.84%	1.49%
2009	3.61%	-0.36%	3.97%
2010	2.64%	1.64%	1.00%
2011	2.03%	3.16%	-1.13%
2012	1.34%	2.07%	-0.73%
2013	1.28%	1.46%	-0.18%
2014	1.65%	1.62%	0.03%
2015	1.99%	0.12%	1.87%
2016	2.12%	1.26%	0.86%
2017	2.19%	2.13%	0.06%
2018	2.67%	2.44%	0.23%
2019	1.88%	1.81%	0.07%
2020	1.74%	1.23%	0.51%
2021	1.22%	4.70%	-3.48%
Average			0.50%
	Excluding 2021		0.78%

Recommendation: Based on the recommended retention of the inflation assumption, **we recommend retaining the current assumption for interest on contribution balances of 3.50%.**

Interest on Contribution Balances	
Current Assumption	3.50%
Recommended Assumption	3.50%

INVESTMENT RETURN

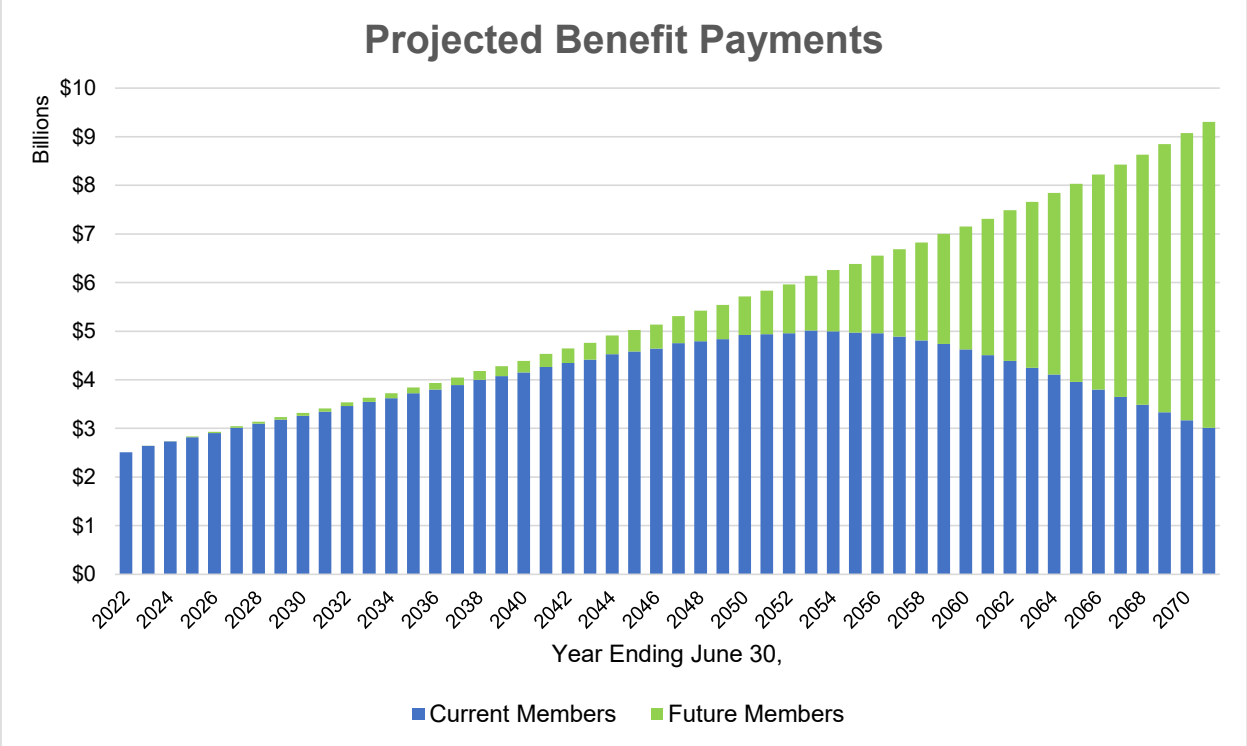
Use in the Valuation: The investment return assumption reflects anticipated returns on the current and future assets. It is one of the primary determinants in the calculation of the expected cost of the System's benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. This assumption has a direct impact on the calculation of liabilities, normal costs, and contribution rates. Generally, the investment return assumption should be set with consideration of the asset allocation policy, expected long term real rates of return on the specific asset classes, the underlying inflation rate, and any investment expenses, but is also impacted by the funding dynamics of the system along with the risk tolerance and preferences of the Board.

The current investment return assumption is 7.00% per year, net of all investment-related and administrative expenses. The 7.00% rate of return is referred to as the nominal rate of return and is composed of two components. The first component is price inflation (previously discussed). Any excess return over price inflation is referred to as the real rate of return. The real rate of return, based on the current set of assumptions, is 4.40% (7.00% nominal return less 2.60% inflation). Because administrative expenses are deducted from the investment returns, the 4.40% is the net real rate of return. The gross real rate of return is 4.45%.

ASOP 27 provides guidance to actuaries on the selection of economic assumptions used for measuring pension obligations. Our findings and analysis, following that ASOP, are discussed below.

Long Term Perspective

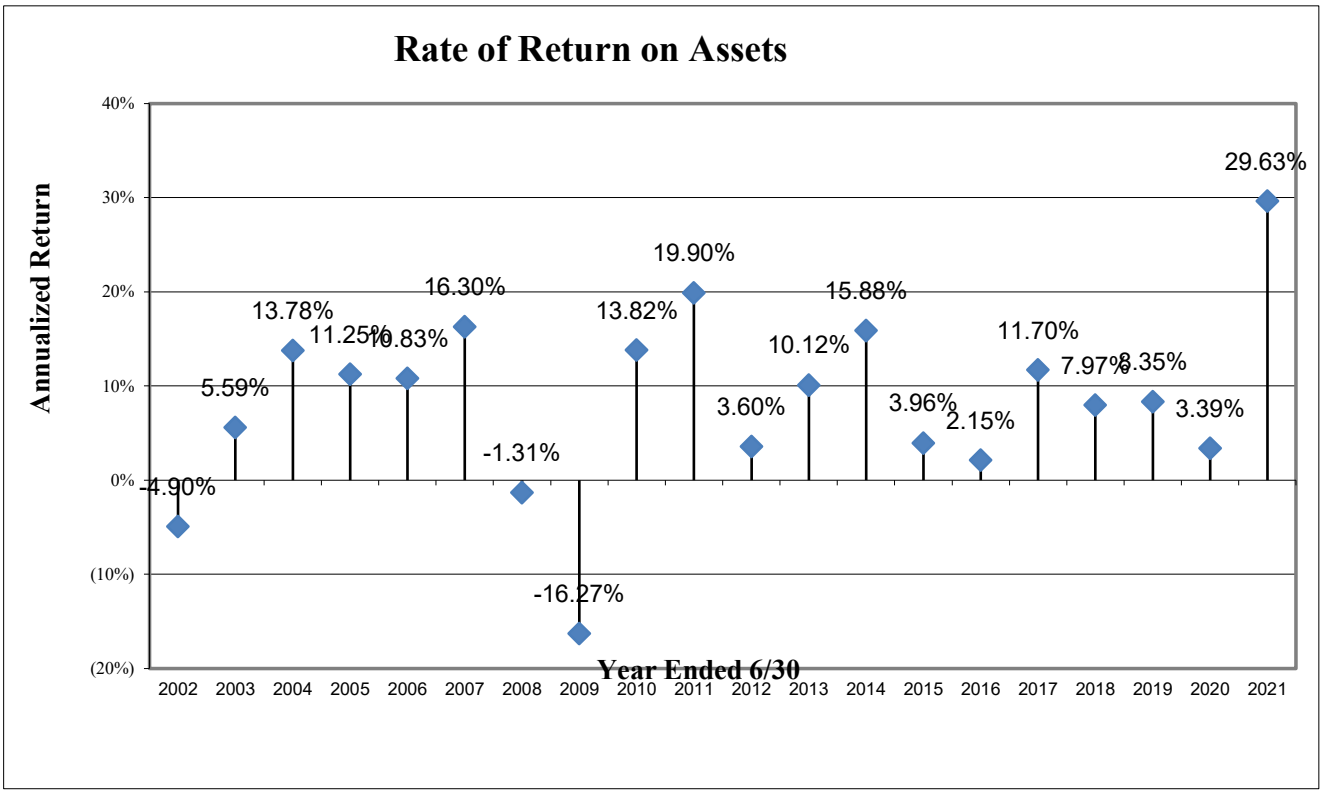
Because the economy is constantly changing, assumptions about what may occur in the near term are volatile. Asset managers and investment consultants usually focus on this near-term horizon so as to make prudent choices regarding how to invest the trust funds, i.e., asset allocation. For actuarial calculations, we typically consider very long periods of time as some current employees will still be receiving benefit payments more than 80 years from now. For example, a newly hired teacher who is 25 years old may work for 35 years, to age 60, and live another 30 years, to age 90. The retirement system would receive contributions for the first 35 years and then pay out benefits for the next 30 years. During the entire 65-year period, the system is investing assets related to that member. For such a typical career employee, more than one-half of the investment income earned on assets accumulated to pay benefits is received after the employee retires. In addition, in an open plan like IPERS, the stream of benefit payments is continually increasing as new hires replace current members who leave covered employment due to death, termination of employment, and retirement. This difference in time horizon is frequently a source of debate and confusion when setting economic assumptions. The following graph illustrates the long duration of expected benefit payments for current members on June 30, 2022, (blue bars) as well as the expected benefit payments for future hires (green bars) based on the valuation model.



IPERS Historical Perspective

One of the inherent problems with analyzing historical data is that the results can look significantly different depending on the timeframe used, especially if the year-to-year results vary widely. In addition, asset allocation can also impact the returns so comparing results over long periods may not be entirely meaningful if the years included had different asset allocations.

The following graph shows the actual fiscal year (June 30) net returns for the IPERS portfolio for the last 20 years. Despite significant volatility in the results from year to year, the 20-year compound return has been 7.86%. Returns over shorter periods, such as 10 and 5 years, have been 9.41% and 11.86%, respectively.



Forward Looking Analysis

We believe the most appropriate analysis to consider in setting the investment return assumption is to model the expected returns given the system's target asset allocation and forward-looking capital market assumptions. Because we are trained as actuaries and not as investment professionals, we rely heavily on professional investment consultants, such as Wilshire, to provide investment expertise including capital market assumptions.

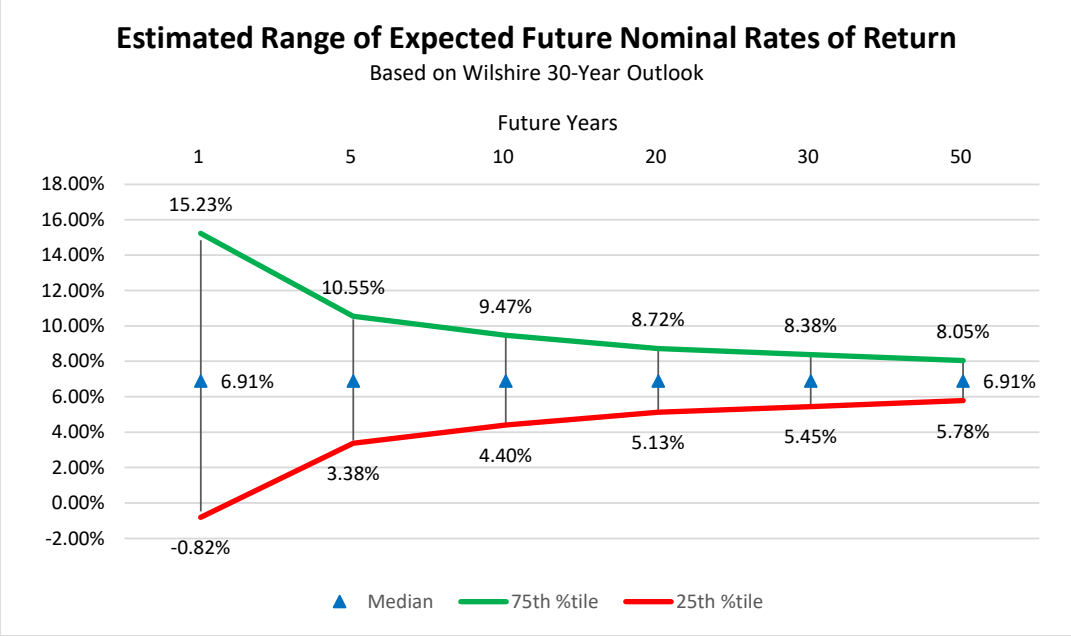
In performing our analysis, we use the building block approach so the real rate of return of the portfolio is modeled, based on the target asset allocation, and then the expected return is added to the price inflation assumption. Therefore, our analysis focuses on the real rate of return while the analysis of the investment consultants more typically focuses on the nominal return in their asset allocation consulting. IPERS' current target asset allocation, along with their investment consultant's (Wilshire Consulting) long-term capital market assumptions, are shown in the following table:

IPERS Target Asset Allocation and Wilshire's 30-Year Assumptions

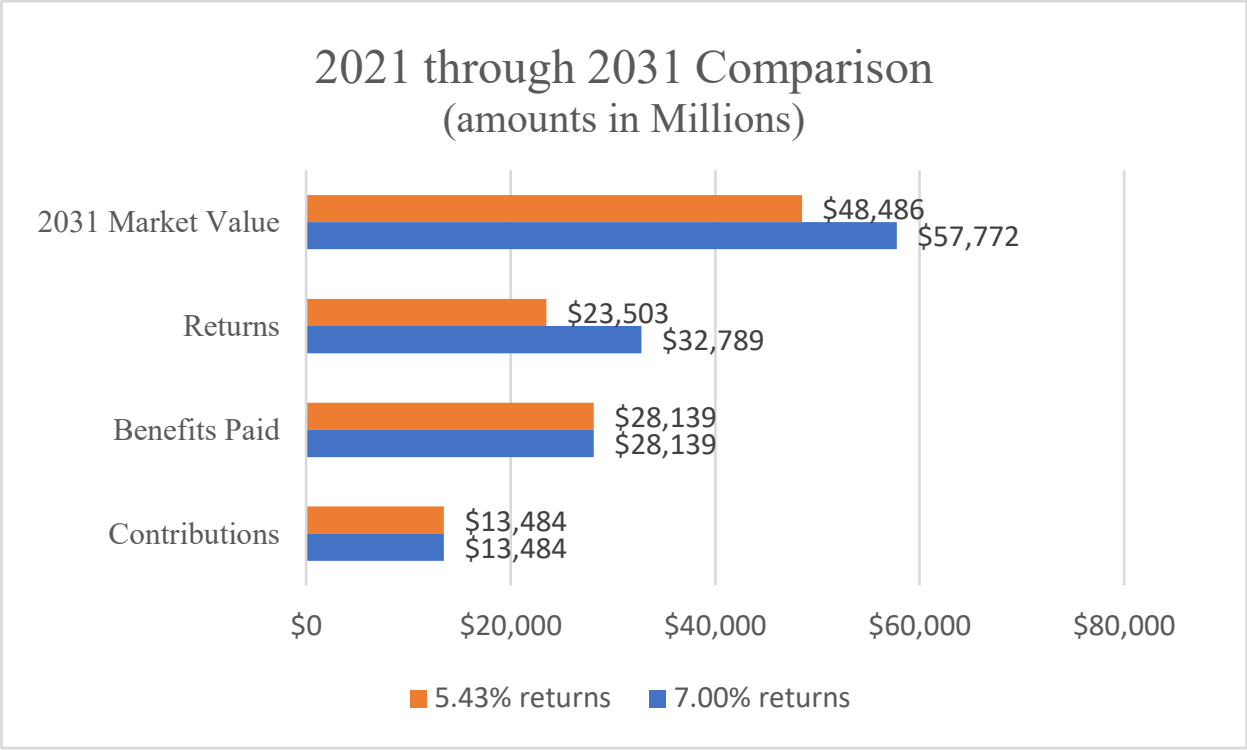
Asset Class	Target Allocation	Nominal Rate of Return	Standard Deviation
Core (Plus) Fixed Income	20.0%	3.65%	4.25%
Public Credit	4.0%	5.60%	8.95%
Private Real Assets	8.5%	6.35%	10.80%
Global Smart Beta	6.0%	6.70%	17.10%
Private Credit	8.0%	5.15%	6.00%
US Equity	22.0%	6.30%	17.00%
International Equity	17.5%	7.05%	19.10%
Private Equity	13.0%	9.50%	28.00%
Cash	1.0%	2.50%	0.75%

Based on their first quarter 2022 capital market assumptions, Wilshire's expected real compound expected return is 2.81% over the next 10 years. Combined with their short-term inflation assumption of 2.60%, the nominal return for the next 10 years is 5.41%. However, using Wilshire's 30-year assumptions, the expected real compound return is 4.31%. Combined with their inflation assumption of 2.55%, the nominal return over 30 years is 6.86%. These movements in expected return over time illustrate the variability of expected returns and the awareness that today's markets are expected to improve over time.

It is also worth noting that the variability year-to-year is fairly significant, but that over time, the expected return is more stable. The following graph illustrates this (using the current 2.6% inflation assumption):



Another factor in using the information provided by Wilshire is reflecting both the short term and long term expectations. While actuaries typically consider a long-term perspective, they cannot ignore that the short-term must occur before the long term can occur. This is especially relevant in the present economic environment where bond yields are relatively low from a historical perspective and expected to increase. This movement is likely to dampen investment returns for the next few years, which is seen in Wilshire's short term expectations being lower. To see the impact of this, we compared projected financial results in ten years under a 5.43% return vs. a 7.00% return. The following chart shows the results for the Regular membership.



Note that the cash flows are unchanged (because of the deferred asset gains and the current contribution margin), but there is a net outflow of nearly $15 billion over 10 years This negative cash flow means that even though returns are expected to be higher in the long term, the higher returns will apply to a smaller asset base and therefore the effective long-term return will not be as high as the Wilshire estimate which ignores net cash flows.

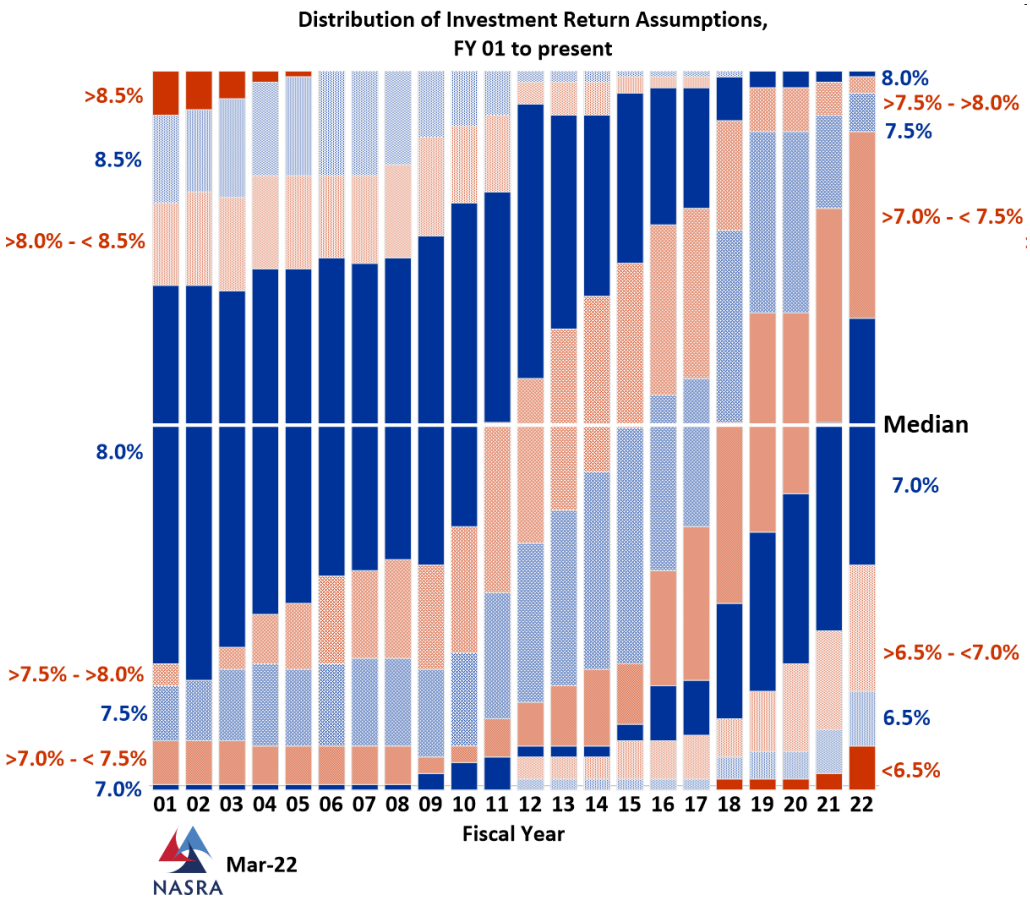
It should be noted that there is currently a fair amount of variation in expectations among investment professionals. Therefore, it can be beneficial to consider other advisors' expectations when setting the investment return assumption. Horizon Actuarial Services prepares an annual study in which they survey various investment advisors and provide ranges of results as well as averages. The 2021 Survey included a total of 39 investment advisors who provided their capital market assumptions as of early 2021. We have observed that with higher inflation emerging in 2021 and the strong market returns in 2021, many advisors have made significant changes in their long-term assumptions. Therefore, we are hesitant to utilize this study in the same way as we have in the past. We did consider the 2022 capital market assumptions of four other investment consultants with whom we work. Combining those assumptions with the IPERS portfolio

asset allocation targets, the estimated return over a 10-year timeframe varied from 4.2% to 5.6%, while assumptions from the two advisors who provide 30-year assumptions yielded estimates of 6.7% and 8.5%. These results affirm the reasonableness of the Wilshire capital market assumptions and the resulting expected returns.

Peer System Comparison

Public retirement systems have historically compared their investment performance to their peer group. While we believe there is some merit in assessing the movement in the assumed rate of return for other systems, this is not an appropriate basis for setting this assumption in our opinion. For example, different plans have different plan dynamics which will impact their choice of the assumed investment return. This peer group information merely provides another set of relevant data to consider as long as we recognize that asset allocation varies from system to system.

The following graph shows the change in the distribution of the investment return assumption from fiscal year 2001 through March, 2022 for the 120+ large public retirement systems included in the NASRA Public Fund Survey. As it indicates, the investment return assumptions used by public plans have decreased over the last twenty years. It is worth noting that the median investment return assumption dropped from 8.00% in 2011 to 7.00% in 2022. During this time, the median inflation assumption also declined over 1% as the typical assumed real return (nominal return net of inflation) actually increased slightly.



Investment and Administrative Expenses

The analysis in the preceding section utilized Wilshire's capital market assumptions which were developed to be net of fees but assumed passive investment in equities and bonds. IPERS pursues an active investment approach in some cases, but it is reasonable to assume that this strategy will produce sufficient additional returns to offset the expense of active management. Consequently, there is no need to adjust the results of the prior section for investment-related expenses.

IPERS does incur certain administrative expenses that are paid from the trust. One approach to reflecting these expenses is to consider them as a percentage of assets and deduct the expense from the expected return, thereby creating a net real rate of return assumption. Alternatively, the expenses can be directly allocated to the current year by including them in the determination of the actuarial contribution rate. Both methods are acceptable under actuarial standards and are commonly used.

The following table shows the ratio of administrative expenses to assets and to covered payroll over the last ten fiscal years:

Fiscal Year	Administrative Expenses ($M)	Actuarial Value Assets ($M)	% of AVA Expense Ratio	Covered Payroll ($M)	% of Pay Expense Contr
2021	$13.9	$34,486	0.04%	$8,649	0.16%
2020	13.6	33,324	0.04%	8,392	0.16%
2019	15.7	31,828	0.05%	8,151	0.19%
2018	14.8	30,472	0.05%	7,983	0.19%
2017	15.9	29,034	0.05%	7,863	0.20%
2016	14.9	27,915	0.05%	7,557	0.20%
2015	12.6	26,460	0.05%	7,326	0.17%
2014	14.9	24,711	0.06%	7,099	0.21%
2013	12.1	23,530	0.05%	6,880	0.18%
2012	13.0	22,575	0.06%	6,786	0.19%

Historically, IPERS has reflected the administrative expenses through a reduced expected return assumption. With the adoption of Governmental Accounting Standards Board Nos. 67 and 68 which require an explicit reflection of administrative expenses in certain accounting calculations, there has been a movement towards directly reflecting the administrative expenses as part of the actuarial contribution rate rather than lowering the expected return assumption to account for the impact of administrative expenses.

If the current approach is retained, we note the administrative expenses in recent years have averaged around 0.05% so we believe that would be a reasonable assumption for the reduction in expected return due to administrative expenses. If a change is made to reflecting expenses as a component of contributions, we would suggest that the most recent rate (0.16% of pay for the 2021valuation) be used.

Recommendation:

Because investment earnings account for the majority of revenue for most public plans, the choice of an investment return assumption has a major impact on a system's financing and actuarial funded status. An investment return assumption that is too low will overstate liabilities and costs, causing current members/ taxpayers to be overcharged and future members/taxpayers to be undercharged. An investment return assumption that is too high will understate liabilities and undercharge current members/taxpayers at the expense of future members/taxpayers. An assumption that is significantly wrong in either direction will cause a misallocation of resources and inequitable distribution of costs among generations of members/taxpayers. Because of this, setting the investment return assumption requires a balancing act with an attempt to not be overly conservative nor aggressive.

By actuarial standards, we are required to maintain a long-term perspective in setting all assumptions, including the investment return assumption. Therefore, we believe we must be careful not to let recent experience or short-term expectations impact our judgment regarding an appropriate investment return assumption over the long term. However, given the material difference in expectations in the short and long term it is difficult to ignore the impact of the lower returns on the funding of the system.

Since experience studies are performed only every four years and investment consultants modify their capital market assumptions at least once a year, we do not believe basing the investment return assumption solely on the most recent estimate from one investment consultant or a survey of several investment consultants is reasonable. Such action could create significant and frequent fluctuations in the system's funded ratio and the corresponding actuarial contribution rate, creating unnecessary challenges in funding the system. Our goal is to choose an assumption that will be reasonable over the long-term with infrequent adjustments. We expect to change this only when there are compelling changes to investment policy, changes in the underlying inflation assumption, or evidence of a change in the long-term trends in the capital markets.

Using our 2.60% recommendation for inflation, Wilshire's long-term expectation is 6.91%. If administrative expenses are to be reflected as part of the investment return rather than as a component of the contribution rate, the net expectation is 6.86%. With the short-term expectation about 1.4% lower, we believe it is reasonable to consider an assumption somewhat lower than the long-term return. This would suggest an assumption of about 6.75%.

As we were completing this study, we received Wilshire's second quarter 2022 updated capital market assumptions. These assumptions increased the short-term expectations by about 0.70% and the long-term expectations by about 0.30%. These revised assumptions suggest that a rate near 7.00% would be reasonable. The shift in the long-term expectations between two quarters reflects the challenges of setting long-term assumptions. As a result, we would prefer to recommend a range of reasonable assumptions and allow the Board to balance their perspectives of risk in selecting a single assumption. In any case, we would suggest reducing the selected rate by 0.05% if administrative expenses are not explicitly recognized.

There is clearly no single investment return assumptions that would also be the only one considered reasonable under Actuarial Standards of Practice, and we are willing to engage in a discussion with the Board about this assumption, if desired. The Board's expectations for future returns, the relative weighting to assign to the results of different analyses, and the Board's risk perspective may also influence the Board's selection of the investment return assumption.

Investment Return	
Current Assumption	7.00%
Recommended Assumption	6.75% - 7.00%

GENERAL WAGE GROWTH

Background: General wage growth, thought of as the "across the board" rate of salary increases, is composed of the price inflation assumption and an assumption for the real rate of wage increases/real wage growth. The excess of wage growth over price inflation represents the increase in the standard of living, also called productivity growth.

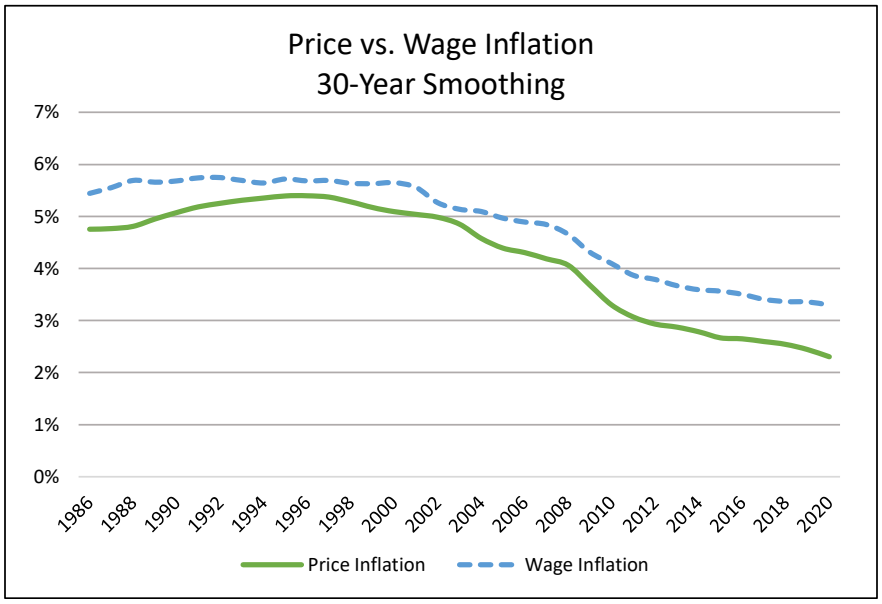
In constructing the salary increase assumption used to project future salary increases for individual members, the wage growth assumption is combined with an assumption for service-based salary increases (called a merit scale). The service-based salary increase assumption will be addressed in section on the demographic assumptions. Given the current price inflation assumption of 2.60%, the current wage growth assumption of 3.25% implies an assumed real rate of wage increase or real wage growth assumption of 0.65%%.

Historical Perspective: Wage statistics are found in the Social Security System database on the National Average Wage data. This information goes back to 1955 and is the most comprehensive database available. Because the National Average Wage is based on all wage earners in the country who are covered by Social Security, it can be influenced by the mix of jobs (full-time vs. part-time, manufacturing vs. service, etc.) as well as by changes in some segments of the workforce that are not seen in all segments (e.g., regional changes or growth in computer technology). Furthermore, if compensation is shifted between wages and benefits, the wage index would not accurately reflect increases in total compensation. IPERS membership is composed exclusively of governmental employees working in Iowa, whose wages and benefits are somewhat linked as a result of state and local tax revenues, funding allocations, and governing policies. Because the competition for workers can, in the long term, extend across industries and geography, the broad national earnings growth will have some impact on IPERS members. In the shorter term, however, the wage growth of IPERS and the nation may be less directly correlated.

The following table shows the compounded wage growth over various periods, along with the comparable price inflation rate for the same period. The differences represent the real wage growth rate.

Years	Period	General Wage Inflation	CPI Increase	Real Wage Inflation
2010 - 2020	10	2.9%	1.7%	1.2%
2000 - 2020	20	2.8%	2.0%	0.8%
1990 - 2020	30	3.3%	2.3%	1.0%
1980 - 2020	40	3.8%	2.8%	1.0%
1970 - 2020	50	4.5%	3.8%	0.7%
1960 - 2020	60	4.5%	3.7%	0.8%

Similar information over rolling thirty-year periods is shown in the following graph:



We note that the Social Security Administration data and assumptions are based on increases in the average or mean wage. Over the past 25 years, the wage index has grown almost 1.2% over inflation. Over the same time period the increase in the median real wage was 0.90% per year, indicating that the increase in wages occurred more at the top end of the wage scale.

Over the last 10 years, BLS data indicates that total compensation costs for state and local government workers increased at an average annual rate of 1.02% above inflation. Because this includes benefit costs, the growth in wages would be expected to be a bit lower. For IPERS membership over the same period, the average salary increased about 0.50% above inflation.

Forecasts of Future Wages: The wage index used for the historical analysis is projected forward by the Office of the Chief Actuary of the Social Security Administration in their 75-year projections. In the June, 2022 Trustees Report, the annual increase in the National Average Wage Index over inflation under the

intermediate cost assumption (best estimate) was 1.15%. The range of the assumed real wage growth in the 2022 Trustees report was 0.53% to 1.77% per year.

Analysis and Conclusion:

Historically, wages have grown at a rate that is greater than inflation, often between 0.7% and 1.0%. Because state and local governments provide a significant proportion of total compensation as benefits, we would expect the increase is wages to be below the national average for all employers. The current 0.65% increase per year reflects these two observations. Currently, the labor market is tight and there is some upward pressure on wages, although inflation is high as well. It is not clear how these two factors will unfold over time, and so we choose to focus on the historical information, but carefully monitoring the unfolding economic situation over the coming months.

Based on the available data and our professional judgment, **we recommend that the long-term assumed real wage growth be kept at 0.65% per year. When coupled with the price inflation assumption of 2.60%, the resulting general wage growth assumption will continue to be 3.25%.**

GROWTH IN MEMBERSHIP

We propose continuing the assumption that no future growth in membership will occur. This assumption affects the amortization payment rate, which is the portion of the total contributions used to pay off the unfunded actuarial liability. With no assumed growth in membership, future salary growth due only to general wage increases is anticipated. If increases should occur not only because of wage increases, but also because of additional members, there will be a larger pool of salaries over which to spread the unfunded actuarial liability, which would result in lower UAL payments as a percent of payroll. The uncertainties in light of current conditions in public employment and the national economy argue against anticipating any increase in membership for funding purposes.

PAYROLL GROWTH ASSUMPTION

Amortization payments on the unfunded actuarial liability are currently determined as a level percent of payroll. Therefore, the valuation requires an assumption regarding future annual increases in covered payroll. The wage growth assumption is typically used for this purpose. The current payroll growth assumption for IPERS is 3.25%, the same as the current wage growth assumption.

We also analyzed the IPERS actual covered payroll growth over the past 15 years and note that it has averaged 2.90% while inflation averaged 2.0% for the same period. While this might support an assumption of payroll growth that is more than 0.65% in excess of inflation, we believe that this is an assumption in which conservatism is warranted to help assure the adequacy of contribution rates.

Based on the recommended wage growth assumption of 3.25%, we recommend the payroll growth assumption also be maintained at 3.25%.

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SUMMARY

The following table summarizes the current set of economic assumptions along with the recommended set of economic assumptions:

	Current Assumptions	Recommended Assumptions
Price Inflation	2.60%	2.60%
Investment Return	7.00%	6.75% to 7.00%
Administrative Expenses	Deduct from investment return	Include in contribution rate
Interest on Member Accounts	3.50%	3.50%
General Wage Growth	3.25%	3.25%
Payroll Growth	3.25%	3.25%

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Actuarial valuations utilize methods to determine the liabilities, assets and contribution rates for the System. While these are not like actuarial assumptions that may change over time depending on experience, an experience study is still a good opportunity to review these methods to see if they are still appropriate for systematically funding the promised benefits.

Together the actuarial cost method, the asset valuation method and the amortization of the unfunded actuarial liability create the cornerstone of the System's funding policy. A significant amount of time and effort was spent during 2013 developing the current Contribution Rate Funding Policy for IPERS and considering modifications that would improve the policy and better address concerns about IPERS' long-term funding. The current policy has achieved the goals established when it was created so we recommend no change. Nonetheless, a brief discussion of each actuarial method is included below. Please see Appendix A for a copy of IPERS' Contribution Rate Funding Policy**.**

ACTUARIAL COST METHOD

The systematic financing of a pension plan requires that contributions be made in an orderly fashion while a member is actively employed, so that the accumulation of these contributions, together with investment earnings should be sufficient to provide promised benefits and cover administration expenses. The actuarial valuation is the process used to determine when money should be contributed; i.e., as part of the budgeting process.

The actuarial valuation will not impact the amount of benefits paid or the actual cost of those benefits. In the long run, actuaries cannot change the costs of the pension plan, regardless of the funding method used or the assumptions selected. However, actuaries **will** influence the timing of costs by their choice of methods and assumptions.

The actuarial cost method is used to allocate the present value of future benefits between past service (actuarial liability) and future service (normal costs). Currently the valuation uses the entry age normal cost method. This is the most widely used cost method of large public sector plans and has demonstrated the highest degree of stability as compare to alternative methods. It also is the required actuarial cost method under calculations required by the Governmental Accounting Standards Board Statements Number 67 and 68. **We recommend the Entry Age Normal actuarial cost method be retained.**

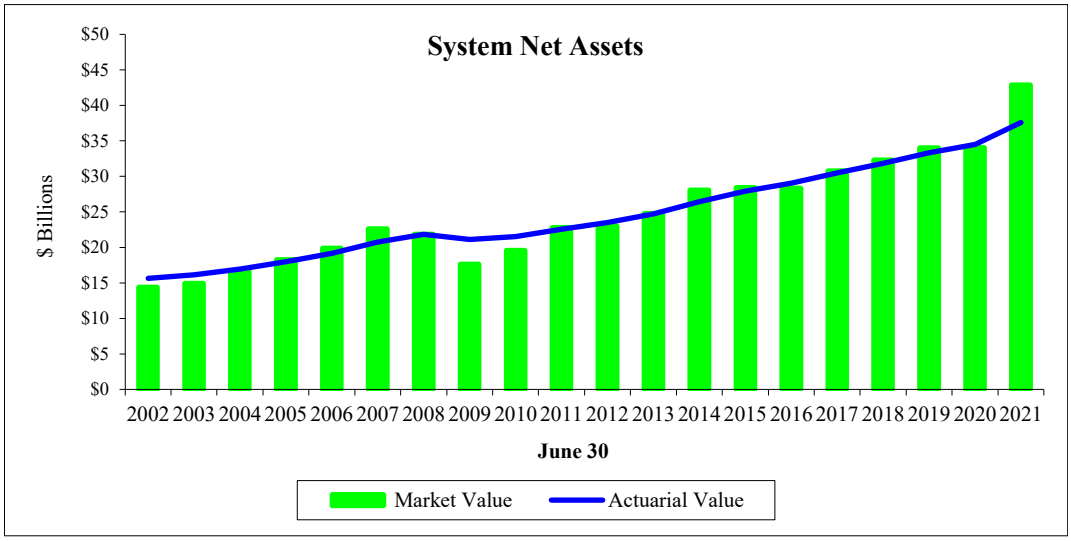
ACTUARIAL VALUE OF ASSETS

In preparing an actuarial valuation, the actuary must assign a value to the assets of the fund. The purpose of an asset smoothing method is to dampen the impact that market volatility has on valuation results by spreading the expected market gains and losses over several years. The actuary does not have complete freedom in assigning this value. The Actuarial Standards Board has basic principles regarding the calculation of a smoothed asset value which are set out in *ASOP 44, Selection and Use of Asset Valuation Methods for Pension Valuations*.

IPERS currently values assets, for actuarial valuation purposes, based on the principle that the difference between actual and expected investment returns should be subject to partial recognition to smooth out fluctuations in the total return achieved by the fund from year to year. This philosophy is consistent with the long-term nature of a retirement system. Under this method, the actuarial value of the assets is the expected value of assets plus 25% of the difference between market value and expected value, where the

expected value is last year's actuarial value and subsequent cash flows into and out of the fund accumulated with interest at the valuation rate (7%). This is mathematically equivalent to using a weighted average of 75% of the expected value and 25% of actual market value.

It should be noted that if the return on the market value of assets was exactly equal to the assumed rate of return in all future years, this smoothing method would converge somewhat slowly to the market value. After five years, 75% of the initial deferred loss would have been recognized, while 94% would be recognized after 10 years. (Some other common methods would fully recognize the loss after just five years.) However, it is very rare for the actual return to be within 0.25% of the assumed rate for even one year, let alone every year over a longer period. In the presence of more normal volatility, this method does a good job of smoothing. In particular, when a significantly positive return occurs and a deferred loss exists (or a negative return when there is a deferred gain), this method moves very quickly toward the market value, and it tends to be more intuitive. The following graph illustrates how the smoothing has worked for IPERS over the past 20 years:



The current smoothing method has smoothed out the actual market volatility, while tracking well with the overall asset movement. Consequently, the fact that this method converges slowly under a highly improbable scenario is not of sufficient concern to outweigh the responsive smoothing that this method otherwise provides.

IPERS' current asset valuation method also includes what is known as a "corridor", which provides that once the initial determination of the actuarial value of assets is made it is compared to a corridor around market value (80% of market value to 120% of market value). If the initial actuarial value lies outside the corridor, the final actuarial value of assets is set equal to the corresponding corridor value. For example, if the initial actuarial value of assets is 132% of market value, the actuarial value is instead set equal to 120% of market value. We believe the corridor is necessary to ensure actuarial standards (*ASOP 44*) are met. We believe the current method, with the corridor, is reasonable and meets actuarial standards. **We recommend the current asset valuation method be retained.**

AMORTIZATION OF UAL

As described earlier, actuarial liabilities are the portion of the actuarial present value of future benefits that are not included in future normal costs. Thus it represents the liability that, in theory, should have been funded through normal costs for past service. Unfunded actuarial liabilities (UAL) exist when actuarial liabilities exceed plan assets. These deficiencies can result from (i) plan improvements that have not been completely paid for, (ii) experience that is less favorable than expected, (iii) assumption changes that increase liabilities or (iv) contributions that are less than the actuarial contribution rate.

There are a variety of different methods that can be used to amortize the UAL. Each method results in a different payment stream and, therefore, has cost implications. For each methodology, there are three characteristics:

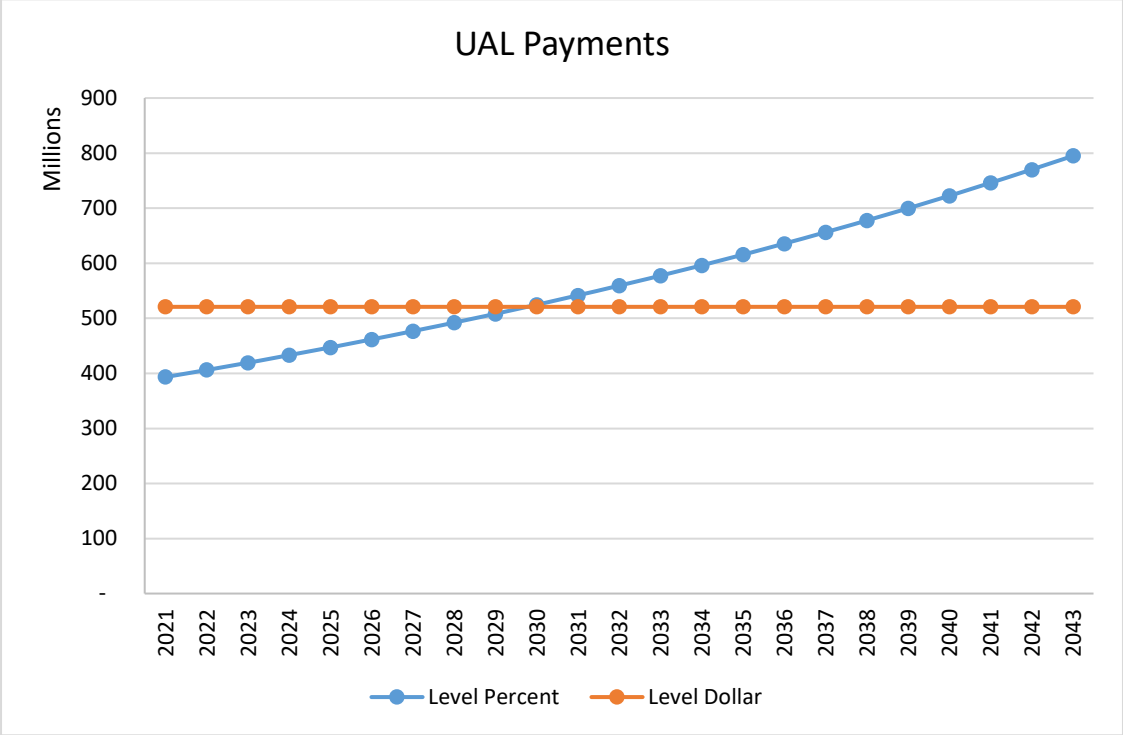
- The period over which the UAL is amortized,
- The rate at which the amortization payment increases, and
- The number of components of UAL (separate amortization bases).

Amortization Period: The amortization period can be either closed or open. If it is a closed amortization period, the number of years remaining in the amortization period declines by one in each future year. Alternatively, if the amortization period is an open or rolling period, the amortization period does not decline but is reset to the same number each year. This approach essentially "refinances" the System's debt (UAL) every year.

Amortization Payment: The level dollar amortization method is similar to the method in which a home owner pays off a mortgage. The liability, once calculated, is financed by a constant fixed dollar amount, based on the amortization period until the liability is extinguished. This results in the liability steadily decreasing while the payments, though remaining level in dollar terms, in all probability decrease as a percentage of payroll. (Even if a plan sponsor's population is not growing or even slightly diminishing, inflationary increases will usually be sufficient to increase the aggregate covered payroll).

The rationale behind the level percentage of payroll amortization method is that since normal costs are calculated to be a constant percentage of pay, unfunded actuarial liabilities should be paid off in the same manner. When this method of amortizing the unfunded actuarial liability is adopted, the initial amortization payments are lower than they would be under a level dollar amortization payment method, but the payments increase at a fixed rate each year so that ultimately the annual payment far exceeds the level dollar payment. The expectation is that total payroll will increase as rapidly so that the amortization payments will remain constant, as a percentage of payroll.

As a comparison of the level dollar vs. level percentage amortization methods, we first show the IPERS "legacy" UAL base for Regular members which is currently being paid off over a 23-year period (because the closed 30-year period was established with the 2014 valuation). One graph shows the amortization as an amount, while the other shows the amortization as a rate of pay. For these graphs, is has been assumed that all assumptions are met in the future and no change in assumptions occurs.


UAL Payments
Millions
900
800
700
600
500
400
300
200
100
-
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
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2036
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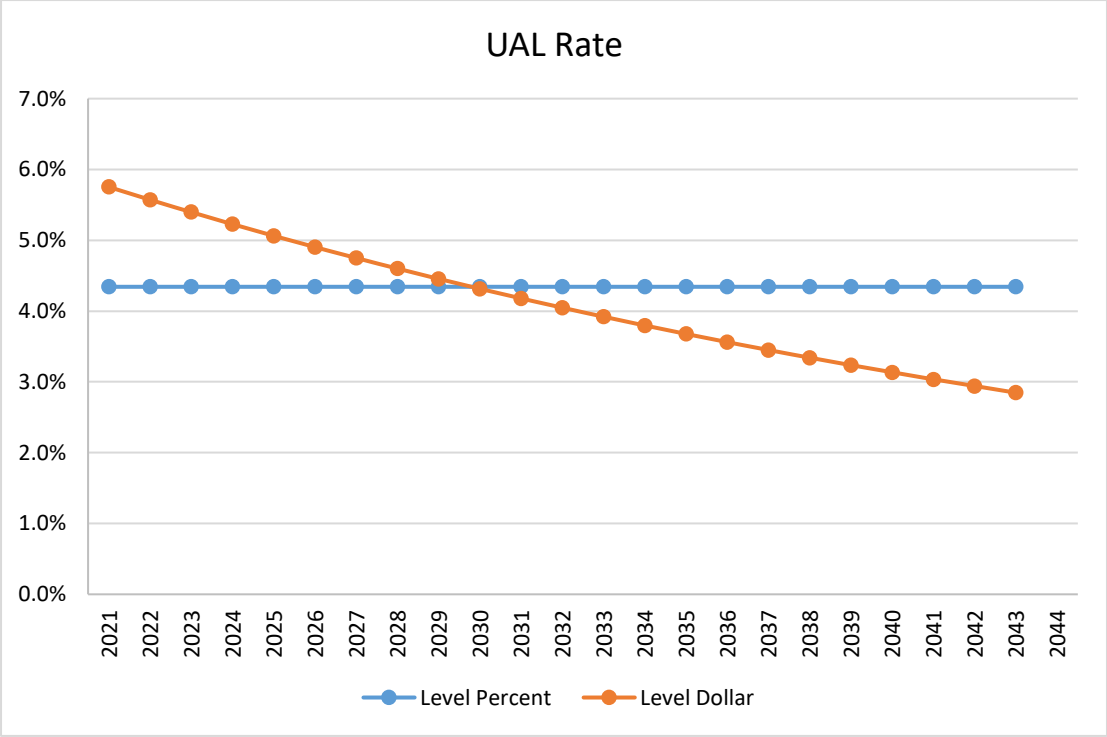
2038
2039
2040
2041
2042
2043
Level Percent
Level Dollar


UAL Rate
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
2021
2022
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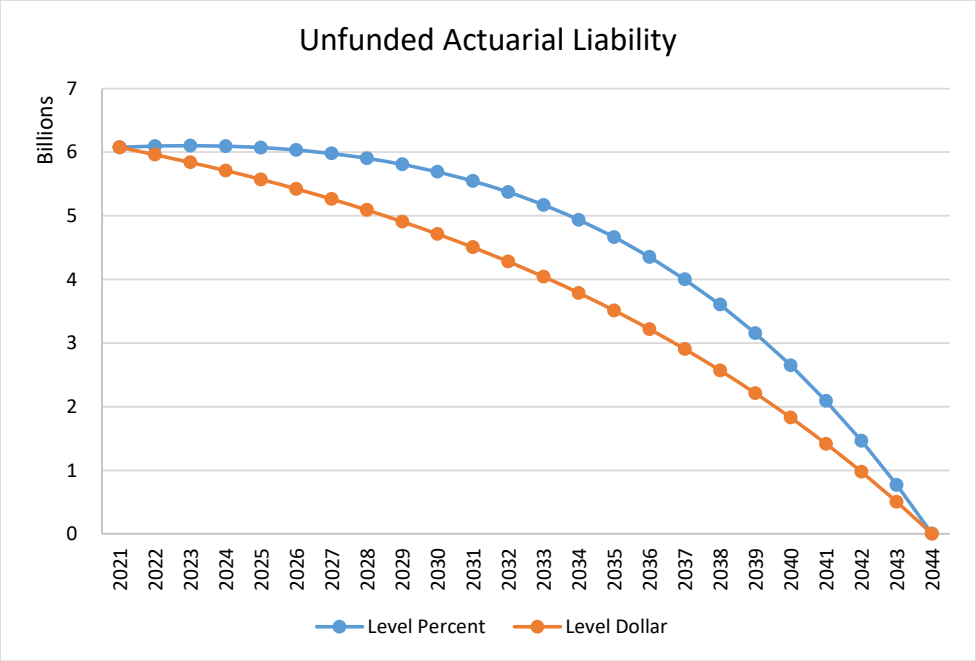
2042
2043
2044
Level Percent
Level Dollar

Use of the level percentage of payroll amortization method has its advantages and disadvantages. From a budgetary standpoint, it makes sense to develop UAL contribution rates that are level as a percentage of payroll since contributions to fund the Plan are made as a percent of payroll and normal cost is developed as a level percent of payroll. Note that under the level dollar amortization method, the UAL contribution rate, as a percent of payroll, actually declines over time.

As might be expected, because the level dollar approach has higher initial payments, the UAL is paid off more rapidly initially. In cases where the amortization period is long enough, under the level percentage method, the initial contributions may not equal the interest of the UAL and result in the UAL growing for a few years. This is referred to as "negative amortization".

Negative amortization is common among public retirement systems, usually the result of the system's funding policy. For most public plans, contribution requirements are expressed as a percent of covered payroll as a means to provide budget stability for employers. Because the expectation is that covered payroll will increase over time, the dollar amounts of contributions (including UAL contributions) is also expected to increase. This means that contributions to pay off the UAL 20 to 30 years from now will be far greater than they are today, even if the contribution rate remains the same. By virtue of developing a payment pattern that is level, as a percent of payroll, the dollar amounts of payments increase significantly over time. As a result, most of the reduction in the dollar amount of the UAL occurs in the last 10 years of the amortization period. When the level percentage of payroll method is used with a long period, such as 30 years, the payments in the early part of the period are less than the interest on the UAL. As a result, the dollar amount of the UAL increases (negative amortization) even if all assumptions are met and the full actuarial contribution is made.

The following graph compares the outstanding balance of the UAL under the level dollar and level percent of payroll methods:



Because IPERS has a relatively low payroll growth assumption and the remaining number of years on the legacy base is 23 years (as of the 2021 valuation), the legacy base grows by less than ½ of 1% over the next five years before returning to its present level. The new bases established under the IPERS' Contribution Rate Funding Policy (discussed below) are amortized over a closed 20-year period and do not have negative amortization under the current or proposed assumptions.

Amortization Bases:

The UAL can either be amortized as one single amount or as components or "layers", each with a separate amortization base, payment and period. If the UAL is amortized as one amount, the UAL is recalculated each year in the valuation and the amortization payment is the total UAL divided by an amortization factor for the applicable amortization period.

If separate amortization bases are maintained, the UAL is composed of multiple amortization bases, each with their own payment and remaining period. In each valuation, the unexpected change in the UAL is established as a new amortization base over the appropriate amortization period beginning on the valuation date. The UAL is then the sum of all of the outstanding amortization bases on the valuation date and the UAL payment is the sum of all of the amortization payments on the existing amortization bases. This approach provides transparency in that the current UAL is paid off over a fixed period of time and the remaining components of the UAL are clearly identified. Adjustments to the UAL in future years are also separately identified in each future year. One downside of this approach is that it can create some discontinuities in contribution rates when UAL layers/components are fully paid off. This may not occur, and if it does, it would be far in the future, with adequate time to make adjustments.

IPERS Current Actuarial Amortization Method:

While updating the Contribution Rate Funding Policy, the Board also reviewed the Actuarial Amortization Method and certain changes were made. As a result, the existing UAL on June 30, 2014 was amortized over a closed 30-year period. For each valuation subsequent to June 30, 2014, the total annual net experience gains and losses for each membership group are amortized, as a level percentage of payroll, over a new, closed 20-year period. Changes in the actuarial liability from assumption changes or benefit provision changes are amortized over a new, closed period, with the length of the period determined by the Board, based on discussions with the actuary. Please see Appendix B for a copy of the Actuarial Amortization Method document. **We believe the current actuarial amortization method meets the goals and objectives of the Contribution Rate Funding Policy and complies with actuarial standards. Therefore, we recommend it be retained.**

RECOGNITION OF THE IMPACT OF THE FAVORABLE EXPERERIENCE DIVIDEND IN THE ACTUARIAL VALUATION

The Favorable Experience Dividend (FED) refers to a provision of the Iowa Code which provides that when certain criteria are met, funds within the trust are transferred to a separate account (on paper) and used to pay a special supplemental benefit to retirees. Until recently, the funded status of IPERS Regular membership was such that there was a low likelihood of any transfers to the FED being made for many years. Consequently, the assumption in the valuation was that no future transfers to the FED would be made. With the investment gains and improved funded status in recent years, the likelihood of future FED transfers in the next ten to fifteen years has increased. Consequently, we believe that the value of the anticipated FED transfers should be reflected as part of the liabilities (obligations) of IPERS. It should be noted that in the recent actuarial audit of IPERS, the auditing actuarial firm also indicated a preference for the recognition of these future transfers. A related provision is the Supplemental Accounts for Active Members (SAAM) in which active members are provided an individual notional account which is credited with the excess of the total contribution rate over the normal cost rate applied to each member's covered payroll when IPERS is fully funded.

The FED is funded by the transfer of the favorable actuarial experience, but not to exceed the surplus. If we simply assume that all assumptions were met each and every year, there would be no favorable experience. However, the investment return assumption, in particular, is developed by determining the effective long-term return in the presence of year-to-year market volatility. By using a stochastic modeling approach, we can estimate the expected transfers to be made to the FED and the likely distribution of amounts. This allows us to include these future transfers which are then paid out as dividends to retirees in the liability.

Several technical details are worth noting. First, we have prepared our model assuming that the random investment returns are independent and identically distributed each year. The underlying parameters would reflect that the portfolio is expected to have the assumed investment return with the current volatility (currently a standard deviation of 12.18%). We have reflected both the FED and SAAM transfers as being payouts in the year in which the transfer is made, even though the funds actually remain in the trust since the benefits derived from these transfers are based on the amount earmarked in a sub-account. We also note that the actual benefits to be paid from the FED to the retirees has a discretionary component that is determined by IPERS. We have assumed that payouts would generally be as large as possible, rather than at a lower level designed to make payments in future years more likely. As will be discussed, the reflection of future transfers may lead to reconsideration of the funding policy and other practices. Consequently, we have used some simplifying assumptions in our analysis with the intent to refine our approach once any policy or related assumption changes have been made. We believe our estimates are reasonable and appropriate for this discussion.

We also note that the FED and SAAM were first developed in a funding framework in which the Regular membership contribution rate was a fixed contribution rate, set in statute, which had been constant for many years. Legislation has subsequently made the contribution rate variable and the IPERS Board has developed a funding policy to guide them in setting the statutory contribution rate. There are some interactions between a variable contribution rate and the rules for the FED and SAAM transfers that we believe may not reflect the original intent of the FED and SAAM. Because these interactions may guide some of the policy and assumption decisions to be made in the future, we believe it is important to point them out at this time.

The general concept of the FED and SAAM is to provide additional non-guaranteed benefits when certain conditions are met, including the System has favorable experience and is fully funded before and after the FED transfer. An alternative would be to retain the surplus of assets over actuarial accrued liability from the favorable experience to offset unfavorable experience that might occur in the future. (The mathematical development of the investment return assumption is based upon this alternative approach.) When funds are used to pay extra benefits now rather than retained for later market downturns, there is potential for contribution increases to be needed at a later date to address the impact of those downturns and return the System to full funding. With the IPERS Contribution Rate Funding Policy, contribution rates increase when the actuarial valuation indicates higher funding is needed, while decreases are intentionally limited. This leads to accelerated funding of negative investment experience less than assumed (shortfalls) and the potential for additional FED and SAAM transfers in the future. If contributions did not increase (as was the case when these provisions were enacted), the FED and SAAM benefits would be smaller over time.

Further, the anticipation of future FED and SAAM payments will require prefunding of those benefits. As noted, additional funding increases the expected amount of those benefits. We believe the original intent of the FED and SAAM was to share part of the favorable investment experience that had occurred without raising contributions, but with the current law and policies, valuing the expected transfers in the valuation means that contributions will ultimately need to increase so that funds can be transferred to these programs when the criteria is met.

We anticipate that the issues described here may encourage a review of the statutes and policies related to the FED and SAAM. Consequently, we propose waiting one year to implement the recognition of the FED and SAAM in the valuation process. While the additional liability to be added will depend upon the economic and demographic experience over the next year, we estimate that reflecting the FED and SAAM in the June 30, 2023 valuation may increase the Actuarial Accrued Liability by 8% to 12% and require a contribution rate increase of 1.0% to 1.5% over the following two years. Given the impact of this change, it is prudent to take the necessary time to fully evaluate the current provisions and funding policies in place as well as allow legislative changes that might be desired to occur.

SECTION 5 – INTRODUCTION TO DEMOGRAPHIC ASSUMPTIONS

Actuarial Standard of Practice No. 35 (ASOP 35), *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*, provides guidance to actuaries giving advice on the selection of demographic assumptions for defined benefit plans, such as IPERS.

The purpose of a study of demographic experience is to compare what actually happened to the individual members of the System during the study period (July 1, 2017, through June 30, 2021) with what was expected to happen based on the actuarial assumptions.

Studies of demographic experience generally involve three steps:

- First, the number of members changing membership status, called decrements, during the study is tabulated by age, duration, sex, group, and membership class (active, retired, etc.).
- Next, the number of members expected to change status is calculated by multiplying certain membership statistics, called exposure, by the expected rates of decrement.
- Finally, the number of actual decrements is compared with the number of expected decrements. The comparison is called the actual to expected ratio (A/E ratio) and is typically expressed as a percentage.

In general, if the actual experience differs significantly from the overall expected results, or if the pattern of actual decrements, or rates of decrement, by age, sex, or duration deviates significantly from the expected pattern, new assumptions are considered. Recommended revisions are normally not an exact representation of the experience during the observation period. Professional judgment is required to set assumptions for future experience from past trends and current evidence, including a determination of the amount of weight to assign to the most recent experience. Determining the credibility of the recent experience is as much an art as a science, and Actuarial Standards recognize that the assignment of credibility will vary between actuaries. In particular, we frequently look to the prior study for confirmation of trends.

In addition to the traditional "headcount" or "count" basis, we also analyzed the experience using a "liability-weighted" approach. The member's liability in the System is generally determined by the benefit amount and age of the member. Some assumptions already reflect differences by age directly. The other factor, benefit amount, is impacted by a member's salary and service. These two factors are used to estimate the member's relative benefit level and to weight experience (the exposure and actual occurrences are scaled by salary and service). This approach is particularly insightful when analyzing experience from a non-homogenous group. With separate assumptions for each subgroup in the Regular membership this is less of an issue. However, for a large group like the School members where differences between certificated and non-certificated members may be significant, this approach provides additional insight. While we reviewed experience on both a count and liability basis for most assumptions, when there was a significant difference between the two, we generally assigned more credibility to the liability-weighted experience and made recommendations on that basis.

Prior experience studies have included analysis of experience by subgroup for the Regular membership (State, School, Other). In general, that analysis has indicated differences in behavior by members employed by different types of public employers. We believe the use of separate assumptions for each subgroup provides a better estimate of the total System liability. The Investment Board adopted this approach, as recommended by the actuary in the 2005-2009 experience study and we recommend it be retained.

SECTION 5 – INTRODUCTION TO DEMOGRAPHIC ASSUMPTIONS

When changes in assumptions are proposed, revised rates of decrement are tested by using them to recalculate the expected number of decrements during the study period, and the results are shown as revised A/E ratios.

Salary adjustments, other than the economic assumption for general wage growth, are treated as a demographic assumption. However, the method of investigation needed for salaries is different from that used for the decrements. A description of the procedure followed is included in that section of this report.

It takes a fair amount of data to perform a credible study of demographic assumptions. Because the benefit provisions are similar and membership of the Special Service groups is relatively small, experience for the two Special Service groups has been aggregated when deemed appropriate. In addition, some assumptions have been selected based more on our professional judgment of reasonable future outcomes than actual experience.

The demographic assumptions studied for both Regular and Special Service groups include:

(1) Mortality
(2) Retirement
(3) Disability
(4) Termination of Employment
(5) Probability of Electing a Vested Benefit
(6) Merit Salary Scale

Background: One of the most important demographic assumptions is mortality because this assumption anticipates when retirement payments will stop (the duration of benefit payments). It also predicts when pre-retirement death benefits will be paid. The life expectancies of current and future retirees are predicated on the assumed rates of mortality at each age. Mortality rates have generally declined over the past century with advances in public health and medical techniques, and most actuaries reflect the expectation of this trend continuing in their selection of a mortality assumption. Furthermore, large, public retirement systems typically exhibit better mortality than the general population as a whole.

Actuarial Standards of Practice call for the actuary to make an assumption regarding future mortality improvement. There are two basic ways this can be done. Historically, mortality rates were developed with a "margin" for future improvement, meaning that the probabilities of death were lower than what had been observed in recent data. With the increase of available computational power, a new method became increasingly popular. This method, called the "generational" mortality method, actually improves the mortality table (lowers the probability of death) by a small amount for each year in the future. This is a more direct method of reflecting mortality improvement and is the approach that IPERS has been using for many years.

Because of potential differences in mortality, we studied healthy retirees, disabled retirees and active members separately. Because different assumptions apply to members in each of the three subgroups (State, School and Other), separate analysis was needed for each group.

Regular Membership

Healthy Retirees: The valuation currently uses separate mortality assumptions for male and female members in each group, i.e., State, School, and Other. The current mortality assumptions for healthy retirees are based on the RP-2014 Generational Table for Healthy Annuitants (RP-2014 Table), with some adjustments:

State - Male	RP-2014 Healthy Annuitant, Generational using MP-2017 with no age adjustments and 8.5% increase in rates after age 75
State - Female	RP-2014 Healthy Annuitant, Generational using MP-2017 with no adjustments
School Male	RP-2014 Healthy Annuitant, Generational using MP-2017 with two-year age setback, 10% reduction in rates before age 75, and 20% increase in rates after age 75
School Female	RP-2014 Healthy Annuitant, Generational using MP-2017 with two-year age setback, 25% reduction in rates before age 75, and 10% increase in rates after age 75
Other - Male	RP-2014 Healthy Annuitant, Generational using MP-2017 with one-year age set forward, 10% reduction in rates before age 75, and 8% increase in rates after age 75
Other - Female	RP-2014 Healthy Annuitant, Generational using MP-2017 with one-year age setback, 10% reduction in rates before age 75, and 5% increase in rates after age 75

The terms set forward and set back are used to indicate that mortality rates are adjusted by using rates for an older age (set forward) or a younger age (set back). Thus, a one year set forward indicates that a 65-year-old is assumed to have the mortality rate associated with a 66-year-old in the mortality table.

If the A/E ratio is greater than 100% the assumptions have predicted fewer deaths than actually occurred, while an A/E ratio less than 100% indicates the assumptions have predicted more deaths than have occurred. Because future improvements in mortality are explicitly reflected in the mortality rates applied in future years, there is no need for a margin (setting the A/E ratio well above 100%). Instead, we are looking for an A/E ratio around 100%, which is appropriate since future mortality improvements are reflected with a generational mortality projection. Beginning with the prior study, the analysis of the retiree mortality data has been based on a liability-weighted approach by using the benefit amount in place of simply a count of the number of lives.

The mortality tables used by IPERS project anticipated future mortality improvements on a "generational" basis, i.e., mortality rates are set by the year in which a member reaches a particular age. Since the actual experience in our analysis included deaths in the period July 1, 2017 to June 30, 2021, we projected mortality rates to the year of the exposure for purposes of developing the expected number of deaths at each age. The results of the study for the key ages of 55 to 90 are summarized in the following chart.

Postretirement Mortality for Healthy Lives	2017-2021 Observations		Current Assumption			Proposed
	Exposure	Actual Deaths	Expected Deaths	A/E Ratio (Count)	A/E Ratio (Weighted)	A/E Ratio (Weighted)
Males						
State	23,972	777	731	106%	106%	100%
School	63,391	1,893	1,840	103%	88%	94%
Other	53,865	1,879	1,873	100%	94%	97%
Total	**141,228**	**4,549**	**4,444**	**102%**	**94%**	**96%**
Females						
State	32,277	707	718	98%	105%	100%
School	157,986	2,933	2,967	99%	89%	95%
Other	83,620	1,888	1,897	100%	93%	97%
Total	**273,883**	**5,528**	**5,581**	**99%**	**93%**	**97%**

On a benefit-weighted basis, most of the groups had better than expected mortality, although State males and females did not. The proposed rates reflect a movement toward 100%, in keeping with our general philosophy of moving part way to the observed experience. Note that School group has been most affected by the move to analyze the data on a benefit-weighted basis. Further discussion of some of the relevant factors follows.

In the 2013-2017 Experience Study, we first used a new family of mortality tables, the RP-2014 tables that the Society of Actuaries developed. While public plan data was excluded from the development of the RP-2014 Tables (it was primarily developed for corporate retirement plans), it nonetheless was the most recent available mortality table and broadly-based study of retiree mortality, and so we used it. This family of tables was also published with a mortality improvement scale (MP-2014) to anticipated future improvements in mortality. Each year after 2014, the mortality improvement scale was updated to reflect

the most recent observed experience. We have been used the most recent scale at the time of the last experience study, the MP-2017 Scale, because we recommended its use until the next experience study was performed.

In 2019, the Society of Actuaries released a family of mortality tables based entirely on public retirement plan data. Different mortality tables have been developed for general government employees and retirees, public safety employees and retirees, and teacher employees and retirees. We typically find that these tables are a better fit for public plans, requiring less adjustment, particularly with the fit of retirees under 65. (In private plans, retirements before age 65 are less common and so the mortality patterns seem to differ.) We recommend moving to this family of mortality tables, with some adjustments to the table to better fit the observed data patterns. We also are recommending updating the projection scale used to anticipated future mortality improvement to the MP-2021 projection scale, since it is based on the most up-to-date information available.

We note that a portion of the data during this study period included observations from early 2020 through June 30, 2021 which included the height of the Covid-19 pandemic. We analyzed the mortality data by year, but it did not show that the death rates were noticeably higher during the key time periods of the pandemic. This is consistent with our experience with other statewide retirement systems, and likely reflects that public plan retirees tend to be in comparatively better socio-economic groups relative to the population as a whole. To the extent that there were additional deaths arising from the pandemic, the result would be to increase mortality rates slightly (at older ages) relative to what they would have been in the absence of Covid-19. At this time, it appears that Covid-19 will likely become endemic in the population at some level, which would mean that slightly higher mortality rates are indeed appropriate. Therefore, we believe that our recommendations are based on the best available information. Between now and the next study, we will continue to monitor the actual deaths versus the assumed deaths and will suggest changes to this assumption if we believe they are warranted.

We recommend changing the mortality assumptions for males in the Regular membership as follows:

State - Male	Pub-2010 General Member Healthy Annuitant, Generational using MP-2021 with two-year set forward, 8% increase in rates before age 75, and 5% decrease in rates after age 75
State - Female	Pub-2010 General Member Healthy Annuitant, Generational using MP-2021 with two-year set forward, 20% increase in rates before age 75, and 10% decrease in rates after age 75
School Male	Pub-2010 General Member Healthy Annuitant, Generational using MP-2021 with no age adjustments, and 20% decrease in rates before age 75
School Female	Pub-2010 General Member Healthy Annuitant, Generational using MP-2021 with one-year setback, 10% increase in rates before age 75, and 6% increase in rates after age 75
Other - Male	Pub-2010 General Member Healthy Annuitant, Generational using MP-2021 with two- year set forward, and 3% decrease in rates
Other - Female	Pub-2010 General Member Healthy Annuitant, Generational using MP-2021 with no age adjustment, and 4% increase in rates

Beneficiaries: The mortality of beneficiaries applies to the survivors of members who have elected a joint and survivor option. There is never complete data on the mortality experience of beneficiaries prior to the death of the member because there is no requirement that the death be reported to the System (unless they elected Option 6, joint & survivor with pop-up). Therefore, we recommend we continue to follow standard convention and set the mortality of beneficiaries equal to the mortality of retired members of the same gender.

Disabled Members: The valuation assumes that disabled members, in general, will not live as long as retired members who met the regular service retirement eligibility. There tends to be more fluctuation in disabled mortality than healthy mortality because of differences in the types of disabilities and the relatively small number of disabled members. In addition, the smaller number of exposure results in more volatility. The current assumption is the RP-2014 Disabled Mortality Table, Generational with a three-year set forward for males and a five-year set forward for females. Based on this assumption, the weighted A/E ratios for Regular members males and females in the current study were 104% and 93%, respectively. We prefer to use the same family of mortality tables for all assumptions, even though the A/E ratios indicate the current assumption is a reasonable fit. We recommend changing to the Pub-2010 Disabled Mortality Table, Generational using MP-2021 with a seven-year set forward for males and a five-year set forward for females. The A/E ratios, using the recommended assumptions, are 105% and 101% for males and females respectively.

Active Members: This assumption predicts eligibility for death benefits for active members prior to retirement, rather than the expected lifetime for pension payments. The observed rates of mortality among active members may be impacted by active members first terminating or moving to disabled status before death. In addition, the number of deaths from active membership may be understated because the criteria for reporting for purposes of this study requires that a member's date of death and payment date both occur before June 30. For these reasons, it is likely active death rates are actually higher than the experience data might indicate. Because of these challenges and the very limited number of observed deaths, we frequently find it best to simply use the active member mortality table that corresponds with the retiree mortality table, with some age adjustments to help improve the observed A/E ratio.

The observed A/E ratios, on a count basis, for both the current and proposed assumptions for active members ages 25 to 64 are shown in the following chart. Note that we use count rather than liability weighting for active mortality since some of the same data challenges noted in identifying deaths also apply to the pay amounts needed to weight the experience on liabilities.

Active Members	2017-2021 Observations Exposure	Actual	Expected	Current A/E Ratio	Proposed A/E Ratio
Male					
State	26,070	36	38	95%	97%
School	73,405	51	96	53	64
Other	81,409	79	128	62	81
Total	**180,884**	**166**	**262**	**63%**	**76%**
Female					
State	37,845	26	34	76%	87%
School	242,499	78	131	60	77
Other	126,168	38	101	38	55
Total	**406,512**	**142**	**26**	**54%**	**71%**

Given the small probability of death while members are active and the smaller exposure that results from segmenting the Regular membership into six groups, some volatility in results is to be expected. **We recommend using the Pub 2010 General Employees Mortality Table, Generational using MP-2021, with a two year setback for State males and females, a four year setback for School and Other males, and an eight-year age setback for School and Other females.**

Special Service Groups

For members who are in the Special Service groups, we studied healthy retired and active mortality experience. There was an insufficient number of female members to produce statistically reliable information so our analysis was performed for male members only. While there is more data for males, the number of members is still much smaller than the Regular membership and, therefore, less credibility is assigned to the results.

The current assumption for this group for healthy retirees is the RP-2014 Healthy Annuitant Mortality Table, Generational with a one-year set forward for males with rates increased by 10% over age 75. For actives, the assumption is RP-2014 Employees Mortality Table, Generational with a three-year age setback. It is assumed that 5% of pre-retirement deaths are service related. Like the Regular groups, the current assumption for disabled members is the RP-2014 Disabled Mortality Table, Generational with a three-year set forward for males and a five-year set forward for females

The results of this study are shown below.

	2017-2021 Observations		
Deaths	**Actual**	**Expected**	**A/E Ratio**
Current Assumption			
Healthy Retiree Males	261	244	101% (weighted)
Actives	11	27	41% (count)

There is considerably less data to rely on for the Special Service groups than the regular membership. As stated earlier, we prefer to use the same family of mortality tables for all groups in the IPERS valuation. Since the Special Services groups are generally considered public safety members, we did consider the Pub-2010 Safety table (in addition to the Pub-2010 General table). Based on our analysis, we recommend moving to the Pub-2010 Safety Healthy Annuitant Mortality Table, Generational using MP-2021 with a three-year set forward for males and a two-year set forward for females along with a 4% reduction in the rates. The resulting A/E ratio for retired members who are ages 55 to 90 is 98% for males and 97% for females. For active members, we did not find the Safety table to be a good fit, so we recommend using the Pub 2010 General Employees Mortality Table, Generational using MP-2021, with a four-year setback for males and a two year setback for females. For disabled mortality, we recommend changing to the Pub-2010 Disabled Mortality Table, Generational using MP-2021 with a three-year set forward for males and females.

We recommend that the mortality assumptions described here and detailed in Appendix D be adopted.

Service retirement measures the change in status from active membership directly to retirement. This assumption does not include the retirement patterns of the retirees who terminated from active membership and then commence benefits at a later date. That experience is studied separately later in this section.

Regular Membership

The requirement for early retirement with a reduced benefit is age 55. The requirements for retirement with a full (unreduced) benefit are age 65 or age 62 with 20 years of service (referred to as "normal retirement"). Full, unreduced benefits are also available at or after age 55 if age plus service is at least equal to 88 (referred to as Rule of 88).

Among the members at any age who are eligible to retire with unreduced benefits (Rule of 88 or normal retirement), those who are in their first year of meeting the eligibility requirements are generally more likely to retire than those who met that requirement more than a year ago. We refer to retirement rates for those in their first year of such eligibility as "select" and those beyond that first year as "ultimate." This select/ultimate approach is the basis for our evaluation of the retirement experience.

The summary results of our experience study, on both a count basis and liability-weighted basis, are shown below:

				A/E Ratio		Proposed
Retirements	Exposure	Actual Retirements	Expected Retirements	Count	Weighted	A/E Ratio Weighted
State						
Early	12,852	533	956	56%	68%	76%
Select	2,155	538	533	101%	110%	103%
Ultimate	7,059	1,737	1,829	95%	102%	104%
Total	**2,066**	**2,808**	**3,318**	**85%**	**98%**	**100%**
School						
Early	58,262	1,906	5,244	36%	55%	67%
Select	7,386	1,649	2,259	73%	92%	94%
Ultimate	21,913	4,904	7,499	65%	97%	97%
Total	**87,561**	**8,459**	**15,002**	**56%**	**87%**	**91%**
Other						
Early	45,158	1,240	3,070	40%	61%	70%
Select	5,333	1,049	1,403	75%	88%	86%
Ultimate	18,493	3,711	5,373	69%	93%	94%
Total	**68,984**	**6,000**	**9,846**	**61%**	**86%**	**89%**

Traditional actuarial analysis measures the number of actual retirements compared to the expected number of retirements (A/E ratio on count). However, as we have observed in the past, experience gains on retirements may not appear despite the fact that a smaller than expected number of members retired if the demographic composition of the group retiring was significantly different from that of the total eligible group. In general, if the average salary and service for those retiring was higher than the average salary and service for the total group eligible to retire the expected gains will not materialize. The liability-weighted analysis (far right column in the table above) captures these differences in the experience study results and enables us to develop assumptions that are based on the liability experience rather than

experience using the counts. As is evident in the table above, the A/E ratios on a liability-weighted basis are generally greater than those on a count basis indicating that those electing retirement have, on average, more pay and/or service than those who do not.

In the prior study, the State retirement rates were left unchanged because of concern that residual effects from the 2010 State Early Retirement Incentive Program (SERIP) offered to state employees might be distorting results and the observed experience was not unreasonable. At this point, we are comfortable with adjusting the rates based on the experience observed in this period, especially when it generally confirms trends that were observed in the prior study. We recommend a reduction in the early retirement rates at younger ages and some adjustments for the select unreduced rates involving increases and decreases at different ages that somewhat flattens the rates. We continue to see lower utilization of the ultimate retirement provisions at age 62 and recommend a slight reduction in that rate.

For both the School and Other groups, we continue to see less utilization of early retirement and so recommend reductions in rates. Like the State group, we believe it is reasonable to flatten the select unreduced rates to get a better fit. For the ultimate unreduced rates, we believe the current rates are appropriate, other than we recommend a slight reduction in the assumption for the Other group at age 62.

Inactive Vested Members

Currently, inactive vested members who leave their contributions with the System are assumed to retire at age 62. We reviewed the experience during the four years of observation period and found that the average retirement age was 62. **We recommend the current assumption of age 62 be retained for inactive vested members.**

Special Service Groups

The eligibility requirement for retirement benefits is different for the two Special Service groups. Sheriffs and Deputies may retire at age 50 with 22 years of service. Members in the Protection Occupation group are eligible to retire at age 55. Therefore, a different retirement assumption is used in valuing the liabilities for these two groups and their experience must be analyzed separately as well.

The results of our investigation of retirement experience for ages 50 (Sheriffs and Deputies) or 55 (Protection Occupation) to 65 during this study period are shown below.

				A/E Ratio	
	Exposure	Actual Retirements	Expected Retirements	Count	Weighted
Sheriffs and Deputies	**1,135**	**186**	**206**	**90%**	**90%**
Protection Occupation	**4,262**	**625**	**807**	**77%**	**111%**

The A/E ratios for the Sheriffs and Deputies group is 90% when we consider ages 50 through 65 but is 98% if we consider ages 50 through 64. We currently assume that all members 65 and older retire immediately, even though actual experience shows that some do not. We prefer to maintain a small amount of

conservatism by assuming that everyone will continue to retire at age 65 by leaving the current retirement rates in place.

The Protection Occupation group has an A/E ratio below 100% on a count basis and over 100% on a weighted basis. We note that this group increased in size substantially during the early 2000's as new groups of Regular members moved to the Protection Occupation group. Many of the older members in the group would have had significant portions of service credited as IPERS Regular membership service, potentially affecting the amount of the benefit payable before age 62. We believe this could be affecting the results we are observing and believe it appropriate to leave the rates where they are and make adjustments in the next study when more data from career members will be available.

Currently, inactive vested members who leave their contributions with the System are assumed to retire at age 55. We reviewed the experience during the four years of observation period and found that this is the most common by far age of commencement. **We recommend the current assumption of age 55 be retained for inactive vested members.**

We recommend that the retirement assumptions described here and detailed in Appendix D be adopted.

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Regular Membership

The current disability assumption for the Regular membership utilizes separate disability rates for males and females in each subgroup (State, School and Other). The table below indicates the number of actual and expected disabilities during the study period and the resulting A/E ratios. In general, ratios below 100% indicate fewer disabilities than expected which would generally result in a lower actuarial liability than expected.

	Male			Female		
Disabilities	Actual	Expected	A/E Ratio	Actual	Expected	A/E Ratio
State	24	31	77%	25	51	49%
School	25	61	41%	66	170	39%
Other	41	144	28%	37	113	33%
Total	**90**	**236**	**38%**	**128**	**334**	**38%**

Overall, there were substantially fewer disabilities in all three groups than expected as demonstrated by A/E ratios well below 100%. The results in this study are similar to those in the past two studies, so we believe it is reasonable to continue to reduce the probability of disability for all of the groups. Depending on the actual experience in both the current and prior studies, disability rates were reduced from 10% to 20%. The revised A/E ratios are:

State-males: 92%	State females: 61%
School males: 45%	School females: 43%
Other males: 36%	Other females: 41%.

It is likely that further reductions will be made in the next study if the experience of the last twelve years continues.

Special Service Membership

There are two disability assumptions used in the valuation: (1) ordinary disability and (2) in-service disability. For purposes of the experience study, all disability experience was combined and the expected number of disabilities was the sum of the accidental plus ordinary disability rates times the exposure at each age.

During the current study period, there were 41 disabilities compared to 44 expected, resulting in an A/E ratio of 93%. Due to the small number of exposures for female members in these groups, one set of rates is used for all members. Furthermore, due to the small size of the group (as compared to the Regular membership) actual experience, although considered, cannot be assigned full credibility. The experience in this study period is consistent with the disability rates observed in the last study. The current study indicates the A/E ratio is below 100% but given the small probabilities of disability some volatility in the results is to be expected. We prefer to maintain some conservatism in this assumption because adverse experience with respect to this assumption can be significant from a liability standpoint. We do not see any reason to adjust the rates at this time.

Of the disabilities observed where we could determine the type, 57% were in-service. Currently, the assumption is that two-thirds of the total disabilities are in-service. Because of the limited number of

observations, the observation is reasonable and we recommend that the current assumption be retained. This approach also provides a slight degree of conservatism since the in-service disability benefits are greater than the ordinary disability benefits.

We recommend that the disability assumptions described here and detailed in Appendix D be adopted.

This section summarizes the results of our study of terminations of employment for reasons other than death, retirement, or disability. Rates of termination can vary by age, years of service and gender. In general, rates of termination tend to be highest at younger ages and in the early years of employment.

Regular Membership

Generally speaking, nearly 40% of all terminations occur within the first two years of membership and over 80% occur in the first six years of membership. (Because some individuals start and then terminate before a valuation date, we are actually underestimating those who leave within two years.)

Withdrawal by Membership Year				
	Less Than 2 Years	2nd – 6th Year	7th & Higher Year	All Years
Male	5,249	5,094	2,308	12,651
Female	11,631	13,913	6,508	32,052
Total	**16,880**	**19,007**	**8,816**	**44,703**

The number of terminations includes all members reported to have terminated employment whether voluntary or involuntary. Some of these members subsequently receive refunds of contributions; some return to active membership and some leave their contributions with the System until retirement. This is addressed by the use of explicit assumptions about what happens to the members after they terminate employment. (See Section 10 of this report.)

The following chart shows the actual and expected number of terminations for causes other than death, retirement, or disablement, and the corresponding A/E ratios. In general, terminations lower than expected increase the liabilities, but in terms of the impact on the valuation, which members terminate can be more important than the number of terminations so we tend to focus on the liability weighted results. The specific results are summarized in the tables below:

	Male				Female			
			A/E Ratio				A/E Ratio	
Group	Actual	Expected	Count	Weighted	Actual	Expected	Count	Weighted
State	1,307	799	164%	146%	2,013	1,110	181%	165%
School	4,635	3,169	146%	95%	16,557	11,139	149%	98%
Other	6,709	5,567	121%	85%	13,482	10,558	128%	98%

For the School and Other groups, the A/E ratios on a count basis are well over 100%, indicating that there were more terminations than expected. However, the A/E ratios on a weighted basis are below 100%, indicating that less liability than expected was released due to termination. Because the liability-weighted A/E ratios are close to 100% for Schools and Other females, we believe it is appropriate to retain the assumptions for these groups. We do believe some minor adjustments to Other males can improve the fit.

Both State males and females had significantly more terminations, both on a count and a liability basis, than expected. We examined the experience by year and discussed our observations with IPERS staff, but have no clear explanation as to what may have led to this experience. We believe that an increase in termination rates, especially during the earlier years of service, is warranted. However, because the prior two studies had indicated the need to reduce rates, we wish to proceed cautiously.

The revised A/E ratios, based on the recommended assumptions and liability-weighted results, are as follows:

	Male		Female	
	Current	Proposed	Current	Proposed
State	146%	133%	165%	127%
School	95%	95%	98%	98%
Other	85%	92%	98%	98%

Special Service Groups

In the last experience study, we made some significant changes to the termination assumption for the Special Services group. Previously, both the Sheriffs and Deputies and the Protection Occupation members shared a single age-based assumption. Based on our analysis, we found it appropriate to use separate service-based assumptions.

When we proposed these new assumptions last time, we noted that our initial assumptions might need to be adjusted as we had the chance to gather more data. Based on the results in this study, we adjusted rates to reflect slightly more terminations, especially in the early years of employment for Sheriffs and Deputies.

The revised A/E ratios, based on the recommended assumptions and liability-weighted results, are as follows:

	Current	Proposed
Sheriffs & Deputies	172%	149%
Protection Occupations	135%	124%

We recommend that the termination of employment assumptions described here and detailed in Appendix D be adopted.

Some members who terminate active employment elect to receive a distribution of their member account balance and the appropriate share of their employer balance. We assume that all non-vested members receive a refund of their account balance at the time of termination. In addition, we assume that a certain percentage of active vested members who terminate also elect a refund, thus forfeiting a vested right to their employer-provided monthly benefit. The remaining members are thus assumed to elect to receive a deferred vested benefit at retirement.

Since almost all actives hired when the vesting requirement was four years of service have now worked much longer than that, the number of terminations among vested members continues to decline. Consequently, the impact of this assumption is also less significant than it used to be.

Regular Membership

The current assumption is a service-based assumption which varies by subgroup. The following table shows the number of vested members who terminated and elected to leave their funds with the System and receive a deferred vested benefit, along with the expected count.

Electing a Vested Benefit	2017-21 Observations			A/E Ratio		A/E Ratio
	Exposure	Actual	Expected	Count	Weighted	Proposed Weighted
Male						
State	336	228	246	93%	94%	94%
School	876	744	716	104%	99%	99%
Other	1,088	833	785	106%	101%	101%
Total	**2,300**	**1,805**	**1,747**	**103%**	**99%**	**99%**
Female						
State	565	378	384	98%	94%	94%
School	3,592	3,014	2,971	101%	99%	99%
Other	2,332	1,933	1,752	110%	106%	106%
Total	**6,489**	**5,325**	**5,107**	**104%**	**101%**	**101%**

The experience in this study period was consistent with the current assumption and the experience in the prior experience study. Based on the observed data, we do not see any reason to change assumptions at this time.

Special Service Groups

Because the size of the group is small and termination rates are relatively low, there is little credible data upon which to base this assumption. The A/E ratio, based on the current assumption, was 102% on a count basis and 88% on a liability-weighted basis. Given the small amount of data, we believe the current assumption remains reasonable and we recommend it be retained.

We recommend that the assumptions regarding the probability of electing a deferred vested benefit described here and detailed in Appendix D be retained.

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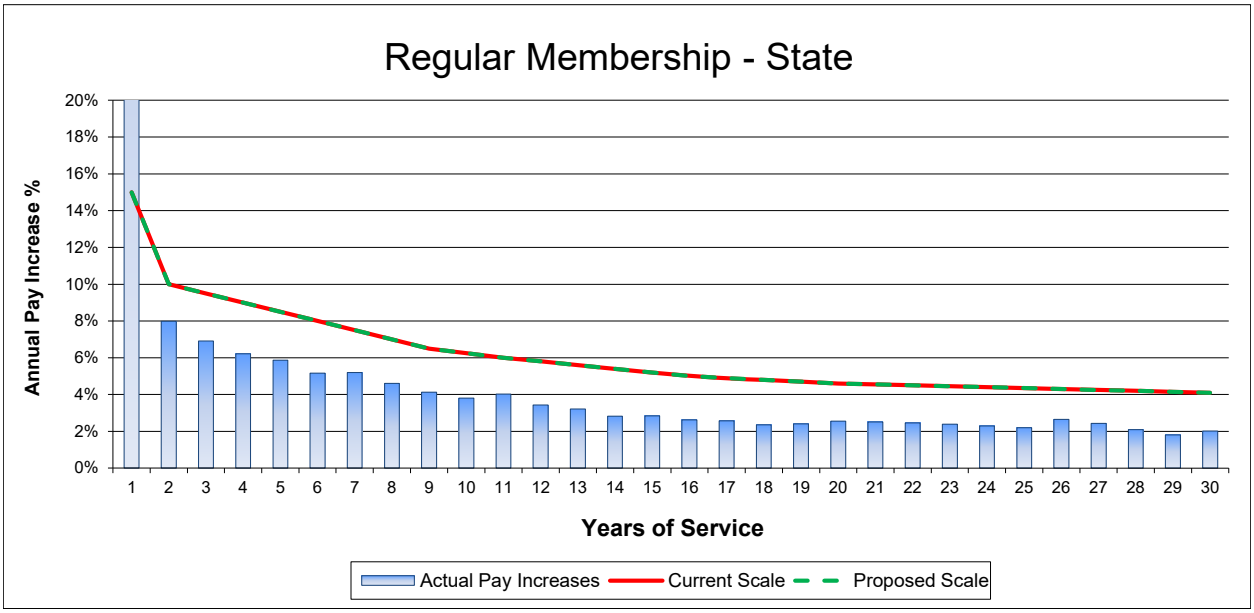
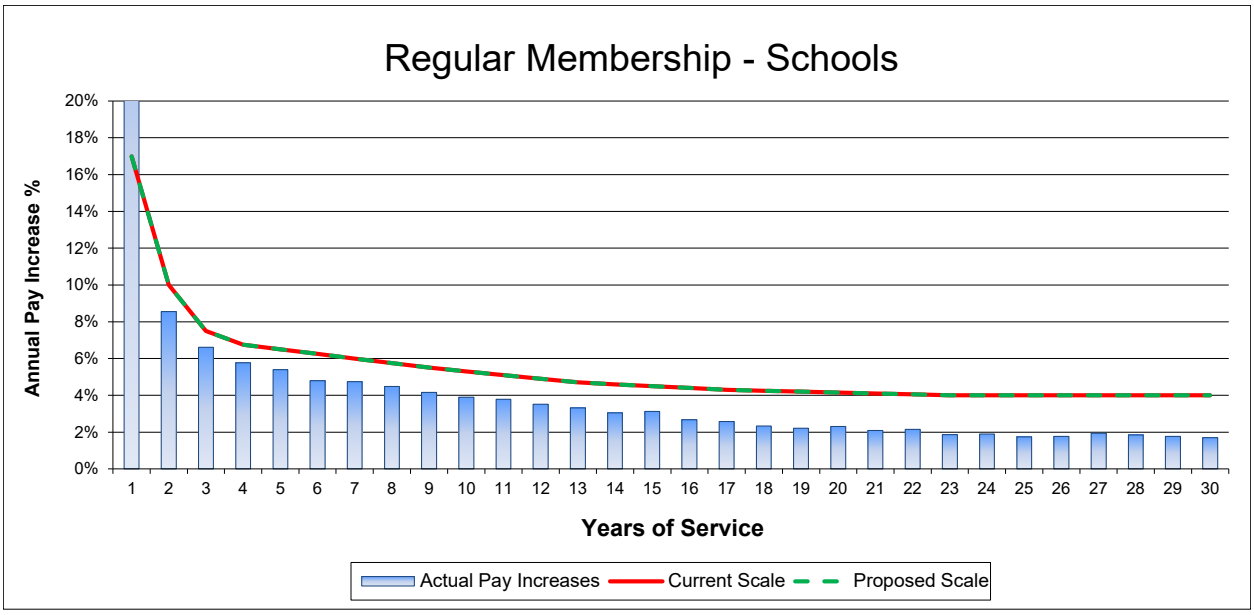
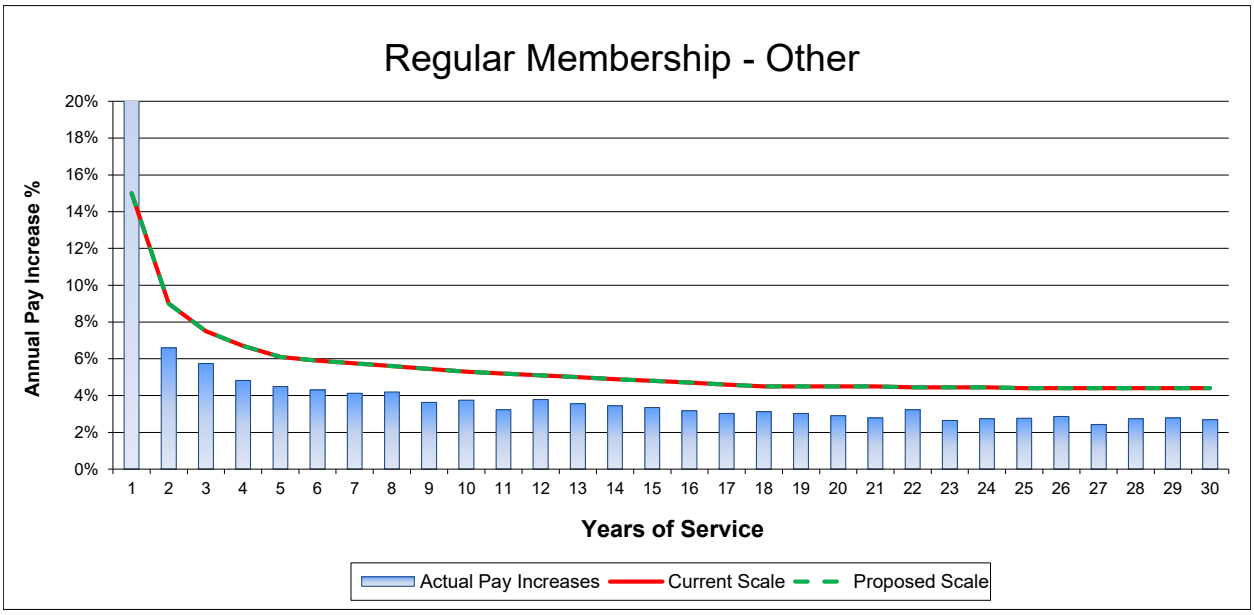
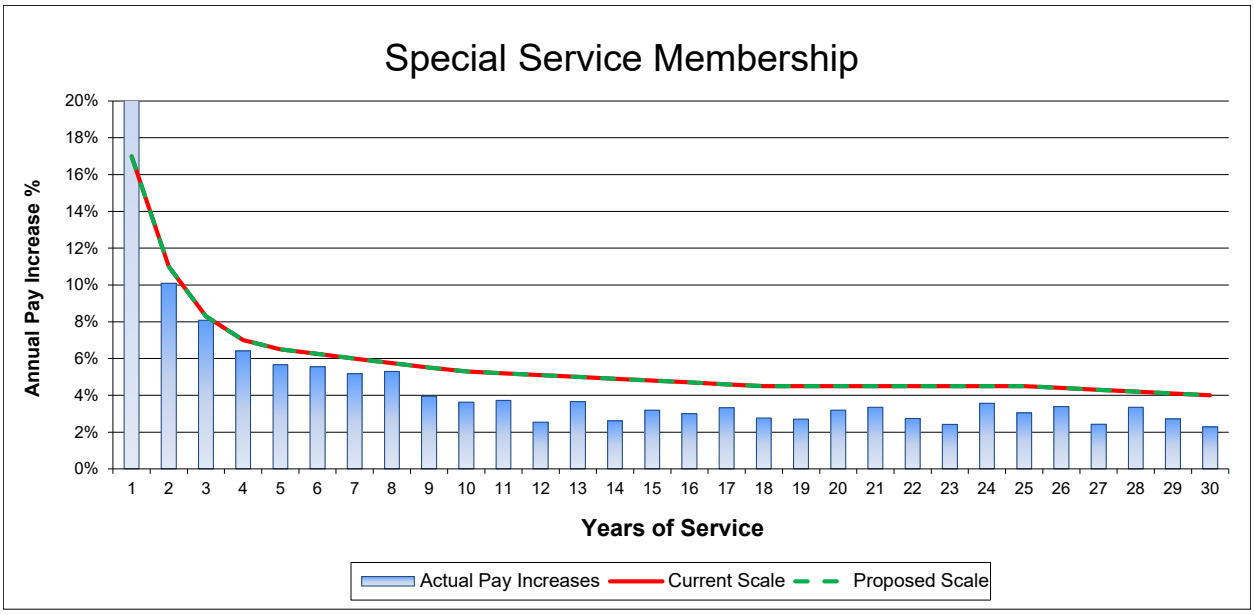
The assumed rates of salary increase provide the expected growth in future salaries both for approximating the future benefits to be provided and the future amounts expected to be contributed to the System through contributions of members and employers. Therefore, this assumption is very material to the valuation results. The actuarial standards of practice recommend a "building block" approach to developing this assumption. Under this approach, the assumption is composed of an assumption for general wage growth (the "across the board" increases granted to active members) and a merit scale reflecting salary increases due to promotion or longevity, based on years of service.

Although future salary increases are the result of these two components, it is difficult, if not impossible, to isolate the true salary adjustment due to inflation and productivity given the number of different employers in IPERS and potential varying conditions for each employer. Therefore, the experience study reviewed total salary increases for the period. We then compare the shape of the observed salary increases to the shape of the merit scale to assess the quality of fit. The following graphs demonstrate this analysis:




Regular Membership - Schools
Annual Pay Increase %
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
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
Years of Service
Actual Pay Increases
Current Scale
Proposed Scale


Regular Membership - Other
Annual Pay Increase %
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
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
Years of Service
Actual Pay Increases
Current Scale
Proposed Scale



Regular Membership

We compared individual salary increases for all members who were active in any two consecutive years (2017 and 2018, 2018 and 2019, etc.). The results for each of the Regular membership groups over the four years studied are shown in the following table:

Fiscal Year End	Average Increase in Salary 2017-2021 State	School	Other
2018	3.09%	3.50%	3.11%
2019	2.57%	3.20%	4.31%
2020	4.33%	4.05%	4.09%
2021	4.80%	3.84%	4.55%
Total Actual	**3.70%**	**3.65%**	**4.03%**
Expected	5.73%	5.02%	5.28%
Expected - Actual	2.03%	1.37%	1.25%

Actual price and wage inflation in the US economy has been low through the study period, so the observed experience is not unexpected.

When we adjusted for these differences, we found that the general shape of the merit salary increase assumption fit well for the three groups. We recommend retaining the current merit salary assumption.

Special Service Members

Separate analysis was done for the two groups of Special Service members. Actual salary increases were lower than expected (4.4% vs. 5.4% for the entire period) as shown in the following table:

	Salary Increases	
Fiscal Year	Actual	Expected
2018	3.57%	5.35%
2019	3.89%	5.34%
2020	4.26%	5.34%
2021	5.68%	5.43%
Total	**4.38%**	**5.37%**

The general wage increase for these groups was, like the Regular membership, less than assumed, which is not unexpected given the low price and wage inflation during the study period. In examining the shape of expected merit increases compared with the observed increases and considering the limited amount of data, we do not see any significant differences that would cause us to recommend a change at this time.

We have come through a period where salary increases for most public employees have been quite low. This is unlikely to remain the long term trend so we prefer to maintain the current assumption.

The actual salary increases observed are lower at all durations due to lower price inflation and corresponding general wage increases in this period. However, the general shape of the merit salary increase assumption is consistent with actual salary increases observed in the study period and we recommend the current assumption be retained.

We recommend that the salary increase assumptions described here and detailed in Appendix D be adopted.

APPENDICES

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APPENDIX A

IPERS CONTRIBUTION RATE FUNDING POLICY

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APPENDIX A
IPERS Contribution Rate Funding Policy

Background:

IPERS is charged with setting a "Required Contribution Rate" for each membership category within IPERS that will discharge its liabilities. Iowa Code §97B.11(3)(d) provides the basic framework for implementing this charge by stating:

> The Required Contribution Rate that is set by the system for a membership category shall be the contribution rate the system actuarially determines, based upon the most recent actuarial valuation of the system and using the actuarial methods, assumptions, and funding policy approved by the investment board, is the rate required by the system to discharge its liabilities as a percentage of the covered wages of members in that membership category. However, the Required Contribution Rate set by the system for members in regular service for a fiscal year shall not vary by more than one percentage point from the Required Contribution Rate for the prior fiscal year.

Goal:

To establish policy and procedures in setting contribution rates that combined with investment income will fund the benefits specified in Chapter 97B of the Iowa Code.

To move towards fully funding the benefits (100% or greater funded ratio) in as expeditious manner as is reasonable within the guidelines acknowledged herein.

Procedure:

The Investment Board shall retain a consulting actuary to conduct an annual actuarial valuation of assets and liabilities. The consulting actuary shall use the entry age normal cost method and all other actuarial assumptions and methods approved by the Investment Board.

In the annual valuation process, the consulting actuary shall calculate an Actuarial Contribution Rate and a Required Contribution Rate pursuant to this policy. Each shall be calculated as a level percent of pay.

There is a one year lag between the completion of an annual actuarial valuation report and the fiscal year to which the contribution rates calculated therein are applied. Therefore, the Actuarial Contribution Rate and the Required Contribution Rate declared in the annual valuation process are applicable to the fiscal year immediately following the completion of the valuation report (for example the rates declared in the report presented to the Investment Board in December, 2013 are applicable to the rates for the fiscal year beginning July 1, 2014).

Actuarial Contribution Rate (ACR):

Section1 ACR is the combined employer and employee contribution rate that is the minimum rate necessary to fund the benefits using the actuarial assumptions and methods approved by the Investment Board.

Section2 A separate ACR shall be determined for each membership group within IPERS according to this policy.

Section3 The ACR shall consist of:
Normal cost and an amortization payment (not less than zero) of any unfunded actuarial liability.
Normal cost may only be offset by a negative amortization payment after a membership group has attained a funded ratio of 110 percent or greater for 3 consecutive years.

Required Contribution Rate:

(a) The Required Contribution Rate is the combined employer and employee rate payable pursuant to this policy and Iowa Code §97B.11(3)(d).

(b) The Required Contribution Rate shall be determined by comparing the ACR determined in the annual valuation process to the Required Contribution Rate of the previous year.

(c) If the ACR is less than the previous Required Contribution Rate by fewer than 50 basis points, then the Required Contribution Rate shall remain unchanged from the previous year.

(d) If the ACR is less than the previous Required Contribution Rate by 50 basis points or more, then the Required Contribution Rate shall be lowered by 50 basis points provided the funded ratio of the membership group is 95% or higher.

(e) If the ACR is greater than the Required Contribution Rate of the previous year, then the Required Contribution Rate shall be:

(1) Increased to be equal to ACR for Sheriffs and Deputies.
(2) Increased to be equal to ACR for Protection Occupation Members.
(3) Increased to be equal to ACR for Regular Members, or one percentage point greater than the prior year's Required Contribution Rate, whichever is smaller.

Policy Guidelines:

In adopting actuarial assumptions and methods to be used in setting contributions, the Investment Board shall strive to provide a balance among the following:

- Stability in contributions (such as use of smoothing and amortization schedules that do not produce dramatic swings in the required contributions from year to year).

- Disciplined funding approach (such as requiring full payment of normal cost and an amortization payment towards the unfunded actuarial liability and deferring decreases in contribution rates until strong funded ratios are attained).

- Interperiod equity (such as shortening the amortization schedule when reasonable and amortization of retroactive benefit enhancements over a reasonable time period such as the average working lifetime for active members and the average life expectancy of retired members).

- Support an affordable, sustainable plan (in consultation with the BAC review affordability of required contribution rates and/or the benefit provisions).

- At a minimum, this policy will be reviewed in conjunction with the quadrennial experience study.

APPENDIX B

ACTUARIAL AMORTIZATION METHOD

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APPENDIX B
Actuarial Amortization Method

The portion of the actuarial present value of benefits allocated to the valuation year is called the normal cost. The portion of the actuarial present value of benefits not provided for by the actuarial present value of future normal costs is called the actuarial liability. Deducting the actuarial value of assets from the actuarial liability determines the unfunded actuarial liability (UAL). The one-year lag between the valuation date and the date the contribution rate is effective is reflected in calculating the corresponding amortization payment. The UAL is amortized according to the Actuarial Amortization Method adopted by the Investment Board and summarized below:

- Amortization payments will be calculated as a level percentage of payroll.

- For the actuarial valuation prepared as of June 30, 2013, the amortization period of the UAL shall be 30 year open for all membership groups.

- For the actuarial valuation prepared as of June 30, 2014:

- The UAL for each membership group shall be amortized over a 30-year closed period.
- This will be designated as the initial UAL base for subsequent valuations and it will be amortized over the remaining years of the 30-year closed period set on June 30, 2014.
- For each valuation subsequent to the June 30, 2014, annual net experience gains/losses for each membership group will be amortized over a new, closed 20 year period.
- Subsequent plan amendments or changes in actuarial assumptions or method that create a change in the UAL will be amortized over a demographically appropriate period selected by the Investment Board at the time that the change is incurred.
- The dollar amount of the UAL payment for purposes of computing the UAL component of the actuarial and required contribution rate will be the sum of the amortization payments for each amortization schedule divided by the total projected payroll. Unless the plan has been 110 percent funded for the current and prior two years, a negative amortization payment shall be ignored.
- If the valuation shows that the membership group has surplus, the prior amortization bases will be eliminated and one base equal to the amount of surplus shall be established. The amortization period of a surplus shall be a 30 year open period for all membership groups.

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APPENDIX C

CURRENT ACTUARIAL ASSUMPTIONS

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APPENDIX C
CURRENT ACTUARIAL ASSUMPTIONS

ECONOMIC ASSUMPTIONS:

Rate of Inflation (effective June 30, 2017)

2.60% per annum

Rate of Crediting Interest on Contribution Balances (effective June 30, 2017)

3.50% per annum, compounded annually

Rate of Investment Return (effective June 30, 2017)

7.00% per annum, compounded annually, net of expenses.

Wage Growth Assumption (effective June 30, 2017)

3.25% per annum based on 2.60% inflation assumption and 0.65% real wage inflation.

Payroll Increase Assumption (effective June 30, 2017)

3.25% per year

Cost of Living Adjustments Assumption (effective June 30, 2017)

2.60% for members who retired before July 1, 1990. No cost-of-living adjustments are assumed to be granted to future retirees

DEMOGRAPHIC ASSUMPTIONS:

Rates of Mortality

Pre-Retirement (effective June 30, 2018)

State	
Male	RP-2014 Employee Table Adjusted to 2006, Generational using
Female	RP-2014 Employee Table Adjusted to 2006, Generational using
School	
Male	RP-2014 Employee Table Adjusted to 2006, Generational using
Female	RP-2014 Employee Table Adjusted to 2006, Generational using
Other	
Male	RP-2014 Employee Table Adjusted to 2006, Generational using
Female	RP-2014 Employee Table Adjusted to 2006, Generational using
Sheriffs/Deputies and Protection Occupation	
Male	RP-2014 Employee Table Adjusted to 2006, Generational using
Female	RP-2014 Employee Table Adjusted to 2006, Generational using

5% of active deaths are assumed to be service related for non-regular members.

Post-Retirement (effective June 30, 2018)

State	RP-2014 Healthy Annuitant Adjusted to 2017, Generational using MP-2017
Male	8.5% increase in rates above age 75
Female	No adjustment
School	RP-2014 Healthy Annuitant Adjusted to 2017, Generational using MP-2017
Male	Base rates setback 2 years, 10% decrease in rates below age 75, 20% increase above age 75
Female	Base rates setback 2 years, 25% decrease below age 75, 10% increase above age 75
Other	RP-2014 Healthy Annuitant Adjusted to 2017, Generational using MP-2017
Male	Base rates set forward 1 year, 10% decrease below age 75, 8% increase above age 75
Female	Base rates setback 1 year, 10% decrease below age 75, 5% increase above age 75
Sheriffs/Deputies and Protection Occupation	RP-2014 Healthy Annuitant Adjusted to 2017, Generational using MP-2017
Male	Base rates set forward 1 year, 10% increase above age 75
Female	No adjustment
Beneficiaries:	Same as members
Disabled Members	RP-2014 Disabled Mortality, Generational using MP-2017
Male	Base rates set forward 3 years
Female	Base rates set forward 5 years

Note: All mortality scaling factors before and after age 75 are geometrically blended between ages 73 and 77.

Retirement Rates (effective June 30, 2018)

Upon meeting the requirements for early retirement, the following rates apply to Regular Members:

	Assumed Retirement Rates – Early		
Age	State	School	Other
55	5.0%	6.0%	4.0%
56	5.0%	6.0%	4.0%
57	5.0%	6.0%	4.0%
58	5.0%	7.0%	4.0%
59	5.0%	8.0%	5.0%
60	5.0%	10.0%	5.0%
61	15.0%	15.0%	10.0%
62	15.0%	15.0%	15.0%
63	15.0%	15.0%	15.0%
64	15.0%	15.0%	15.0%

Upon reaching the requirements for normal retirement (unreduced benefits), the following rates apply:

Assumed Retirement Rates – Select Unreduced

Age	State	School	Other
55	20.0%	25.0%	20.0%
56	15.0%	25.0%	20.0%
57	15.0%	25.0%	17.0%
58	15.0%	25.0%	20.0%
59	15.0%	25.0%	20.0%
60	15.0%	25.0%	17.0%
61	20.0%	33.0%	20.0%
62	40.0%	40.0%	30.0%
63	35.0%	30.0%	25.0%
64	30.0%	30.0%	30.0%
65	30.0%	30.0%	30.0%

Assumed Retirement Rates – Ultimate Unreduced

Age	State	School	Other
55	15.0%	20.0%	12.0%
56	15.0%	20.0%	12.0%
57	15.0%	20.0%	12.0%
58	15.0%	20.0%	12.0%
59	15.0%	21.0%	12.0%
60	15.0%	23.0%	15.0%
61	20.0%	28.0%	20.0%
62	40.0%	35.0%	30.0%
63	30.0%	30.0%	20.0%
64	30.0%	30.0%	25.0%
65	30.0%	45.0%	40.0%
66	30.0%	35.0%	30.0%
67	20.0%	25.0%	20.0%
68	20.0%	25.0%	20.0%
69	35.0%	40.0%	40.0%
70	100.0%	100.0%	100.0%

	Assumed Retirement Rates	
Age	Sheriffs and Deputies	Protection Occupation
50	17.0%	
51	15.0%	
52	15.0%	
53	15.0%	
54	15.0%	
55	15.0%	25.0%
56	15.0%	10.0%
57	15.0%	10.0%
58	15.0%	10.0%
59	15.0%	10.0%
60	15.0%	10.0%
61	15.0%	15.0%
62	30.0%	30.0%
63	30.0%	25.0%
64	30.0%	25.0%
65	100.0%	100.0%

Terminated vested members are assumed to retire at age 62 (55 for Sheriffs/Deputies and Protection Occupation groups).

For Regular Membership, retired reemployed members are assumed to retire at a rate of 25% per year until age 80 when all are assumed to retire.

All retirees are assumed to elect a modified cash refund annuity (Option 2).

Rates of Disablement (effective June 30, 2018)

	Assumed Rates					
	Males			Females		
Age	State	School	Other	State	School	Other
27	0.020%	0.020%	0.020%	0.020%	0.020%	0.020%
32	0.020%	0.020%	0.020%	0.020%	0.020%	0.020%
37	0.030%	0.034%	0.030%	0.030%	0.030%	0.030%
42	0.050%	0.056%	0.050%	0.040%	0.040%	0.040%
47	0.100%	0.098%	0.110%	0.070%	0.070%	0.070%
52	0.180%	0.142%	0.260%	0.180%	0.130%	0.160%
57	0.260%	0.230%	0.500%	0.310%	0.190%	0.280%
62	0.340%	0.318%	0.720%	0.500%	0.260%	0.400%

	Assumed Rates	
Age	Sheriffs/Deputies*	Protection Occupation*
27	0.130%	0.130%
32	0.130%	0.130%
37	0.130%	0.130%
42	0.150%	0.150%
47	0.200%	0.200%
52	0.240%	0.240%
57	0.320%	0.320%
62	0.430%	0.430%

* 66.67% of disabilities are assumed to be in-service disabilities.

Rates of Termination of Employment (effective June 30, 2018)

Regular Membership

	Male			Female		
Years of Service	State	School	Other	State	School	Other
1	11.00%	14.20%	19.00%	11.00%	14.20%	19.99%
5	4.75%	6.60%	7.50%	4.75%	6.60%	8.35%
10	2.25%	2.70%	4.10%	2.25%	2.70%	4.93%
15	1.60%	1.70%	2.64%	1.60%	1.70%	3.36%
20	1.10%	1.20%	2.10%	1.10%	1.20%	2.66%
25	0.80%	1.00%	1.60%	0.80%	1.00%	1.98%
30	0.80%	1.00%	1.10%	0.80%	1.00%	1.30%

Sheriffs/Deputies and Protection Occupation

Years of Service	Sheriffs/Deputies	Protection Occupation
1	4.00%	10.00%
5	1.00%	6.50%
10	1.00%	3.50%
15	1.00%	2.20%
20	1.00%	1.45%
25	1.00%	1.00%
30	1.00%	1.00%

Probability of Electing a Deferred Vested Benefit (effective June 30, 2018)

	Regular Membership					
	Male			Female		
Years of Service	State	School	Other	State	School	Other
5	62.0%	74.0%	62.0%	56.0%	80.0%	70.0%
10	71.0%	79.0%	71.0%	62.0%	80.0%	73.0%
15	76.0%	84.0%	76.0%	72.0%	85.0%	80.0%
20	81.0%	89.0%	81.0%	82.0%	90.0%	85.0%
25	86.0%	94.0%	86.0%	92.0%	95.0%	90.0%
30	90.0%	95.0%	90.0%	100.0%	100.0%	90.0%

	Sheriffs/Deputies and Protection Occupation
Years of Service	Rate
5	53.0%
10	65.0%
15	85.0%
20	95.0%
25	100.0%
30	100.0%

Rates of Salary Increase* (effective June 30, 2018)

	Annual Increase			
Years of Service	State	School	Other	Sheriffs/Deputies and Protection Occupation
1	14.25%	16.25%	14.25%	16.25%
5	7.75%	5.75%	5.35%	5.75%
10	5.50%	4.55%	4.55%	4.55%
15	4.45%	3.75%	4.05%	4.05%
20	3.85%	3.40%	3.75%	3.75%
25	3.60%	3.25%	3.65%	3.75%
30	3.35%	3.25%	3.65%	3.25%
35+	3.25%	3.25%	3.25%	3.25%

* Includes 3.25% wage growth

Marriage Assumption

100% of members are assumed to be married, with males 3 years older than females.

APPENDIX D

PROPOSED ACTUARIAL ASSUMPTIONS

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APPENDIX D
PROPOSED ACTUARIAL ASSUMPTIONS

ECONOMIC ASSUMPTIONS:

Rate of Inflation (effective June 30, 2017)

2.60% per annum

Rate of Crediting Interest on Contribution Balances (effective June 30, 2017)

3.50% per annum, compounded annually

Rate of Investment Return (effective June 30, 2022)

6.75% -7.00% per annum, compounded annually, net of investment expenses.

Wage Growth Assumption (effective June 30, 2017)

3.25% per annum based on 2.60% inflation assumption and 0.65% real wage inflation.

Payroll Increase Assumption (effective June 30, 2017)

3.25% per year

Cost of Living Adjustments Assumption (effective June 30, 2017)

2.60% for members who retired before July 1, 1990. No cost-of-living adjustments are assumed to be granted to future retirees

Administrative Expense Assumption (effective June 30, 2022)

0.16% of pay.

DEMOGRAPHIC ASSUMPTIONS:

Rates of Mortality

To reflect anticipated future mortality improvements, generational mortality is used with projected mortality improvements based on Projection Scale AA.

Pre-Retirement (effective June 30, 2022)

State	
Male	PubG-2010 Employee Table, Generational using MP-2021, setback 2 years
Female	PubG-2010 Employee Table, Generational using MP-2021, setback 2 years
School	
Male	PubG-2010 Employee Table, Generational using MP-2021, setback 4 years
Female	PubG-2010 Employee Table, Generational using MP-2021, setback 8 years

Other	
Male	PubG-2010 Employee Table, Generational using MP-2021, setback 4 years
Female	PubG-2010 Employee Table, Generational using MP-2021, setback 8 years
Sheriffs/Deputies and Protection Occupation	
Male	PubG-2010 Employee Table, Generational using MP-2021, setback 4 years
Female	PubG-2010 Employee Table, Generational using MP-2021, setback 2 years

5% of active deaths are assumed to be service related for non-regular members.

Post-Retirement (effective June 30, 2022)

State	PubG-2010 Healthy Annuitant, Generational using MP-2021
Male	2 Year set forward, 8% increase below age 75, 5% decrease above age 75
Female	2 Year set forward, 20% increase below age 75, 10% decrease above age 75
School	PubG-2010 Healthy Annuitant, Generational using MP-2021
Male	No age adjustment, 20% decrease in rates below age 75
Female	1 Year setback, 10% increase below age 75, 6% increase above age 75
Other	PubG-2010 Healthy Annuitant, Generational using MP-2021
Male	2 Year set forward, 3% decrease at all ages
Female	No age adjustment, 4% decrease at all ages
Sheriffs/Deputies and Protection Occupation	PubS-2010 Healthy Annuitant, Generational using MP-2021
Male	3 Year set forward
Female	2 Year set forward, 4%decrease at all ages
Beneficiaries:	Same as members
Disabled Members	
Regular	PubG-2010 Disabled Mortality, Generational using MP-2021
Male	7 Year age set forward
Female	5 Year age set forward
Sheriffs/Deputies and Protection Occupation	PubG-2010 Disabled Mortality, Generational using MP-2021
Male	3 Year age set forward
Female	3 Year age set forward

Retirement Rates (effective June 30, 2022)

Upon meeting the requirements for early retirement, the following rates apply to Regular Members:

	Assumed Retirement Rates – Early		
Age	State	School	Other
55	4.0%	5.0%	4.0%
56	4.0%	5.0%	4.0%
57	4.0%	5.0%	4.0%
58	4.0%	5.0%	4.0%
59	4.0%	7.0%	4.0%
60	5.0%	10.0%	5.0%
61	15.0%	10.0%	8.0%
62	15.0%	13.0%	11.0%
63	15.0%	13.0%	11.0%
64	15.0%	15.0%	11.0%

Upon reaching the requirements for normal retirement (unreduced benefits), the following rates apply:

	Assumed Retirement Rates – Select Unreduced		
Age	State	School	Other
55	25.0%	26.0%	19.0%
56	20.0%	26.0%	19.0%
57	20.0%	26.0%	19.0%
58	20.0%	26.0%	19.0%
59	20.0%	26.0%	19.0%
60	20.0%	26.0%	19.0%
61	20.0%	33.0%	19.0%
62	30.0%	35.0%	27.0%
63	35.0%	30.0%	20.0%
64	30.0%	30.0%	25.0%
65	30.0%	30.0%	40.0%

	Assumed Retirement Rates – Ultimate Unreduced		
Age	State	School	Other
56	15.0%	20.0%	12.0%
57	15.0%	20.0%	12.0%
58	15.0%	20.0%	12.0%
59	15.0%	21.0%	12.0%
60	15.0%	23.0%	15.0%
61	20.0%	28.0%	20.0%
62	35.0%	35.0%	27.0%
63	30.0%	30.0%	20.0%
64	30.0%	30.0%	25.0%
65	30.0%	45.0%	40.0%
66	30.0%	35.0%	30.0%
67	20.0%	25.0%	20.0%
68	20.0%	25.0%	20.0%
69	35.0%	40.0%	40.0%
70	100.0%	100.0%	100.0%

	Assumed Retirement Rates	
Age	Sheriffs and Deputies	Protection Occupation
50	17.0%	
51	15.0%	
52	15.0%	
53	15.0%	
54	15.0%	
55	15.0%	25.0%
56	15.0%	10.0%
57	15.0%	10.0%
58	15.0%	10.0%
59	15.0%	10.0%
60	15.0%	10.0%
61	15.0%	15.0%
62	30.0%	30.0%
63	30.0%	25.0%
64	30.0%	25.0%
65	100.0%	100.0%

Terminated vested members are assumed to retire at age 62 (55 for Sheriffs/Deputies and Protection Occupation groups).

For Regular Membership, retired reemployed members are assumed to retire at a rate of 25% per year until age 80 when all are assumed to retire.

All retirees are assumed to elect a modified cash refund annuity (Option 2).

Rates of Disablement (effective June 30, 2022)

	Assumed Rates					
	Males			Females		
Age	State	School	Other	State	School	Other
27	0.017%	0.018%	0.016%	0.016%	0.018%	0.016%
32	0.017%	0.018%	0.016%	0.016%	0.018%	0.016%
37	0.026%	0.031%	0.024%	0.024%	0.027%	0.024%
42	0.043%	0.050%	0.040%	0.032%	0.036%	0.032%
47	0.085%	0.088%	0.088%	0.056%	0.063%	0.058%
52	0.153%	0.128%	0.208%	0.144%	0.117%	0.126%
57	0.221%	0.207%	0.400%	0.248%	0.171%	0.224%
62	0.289%	0.286%	0.576%	0.400%	0.234%	0.320%

Assumed Rates
Sheriffs/Deputies
Protection Occupation

Age	Rate
27	0.130%
32	0.130%
37	0.130%
42	0.150%
47	0.200%
52	0.240%
57	0.320%
62	0.430%

Rates of Termination of Employment (effective June 30, 2022)

Regular Membership

	Male			Female		
Years of Service	State	School	Other	State	School	Other
1	14.00%	14.20%	17.50%	14.20%	14.20%	19.99%
5	5.25%	6.60%	7.00%	6.60%	6.60%	8.35%
10	2.40%	2.70%	3.75%	3.25%	2.70%	4.93%
15	1.60%	1.70%	2.55%	2.00%	1.70%	3.36%
20	1.10%	1.20%	1.90%	1.30%	1.20%	2.66%
25	1.00%	1.00%	1.40%	1.00%	1.00%	1.98%
30	1.00%	1.00%	1.00%	1.00%	1.00%	1.30%

Sheriffs/Deputies and Protection Occupation

Years of Service	Sheriffs/ Deputies	Protection Occupation
1	6.00%	11.50%
5	2.50%	6.50%
10	1.15%	3.75%
15	1.00%	2.35%
20	1.00%	1.60%
25	1.00%	1.25%
30	1.00%	1.25%

Probability of Electing a Deferred Vested Benefit (effective June 30, 2018)

	Regular Membership					
	Male			Female		
Years of Service	State	School	Other	State	School	Other
5	62.0%	74.0%	62.0%	56.0%	80.0%	70.0%
10	71.0%	79.0%	71.0%	62.0%	80.0%	73.0%
15	76.0%	84.0%	76.0%	72.0%	85.0%	80.0%
20	81.0%	89.0%	81.0%	82.0%	90.0%	85.0%
25	86.0%	94.0%	86.0%	92.0%	95.0%	90.0%
30	90.0%	95.0%	90.0%	100.0%	100.0%	90.0%

	Sheriffs/Deputies and Protection Occupation
Years of Service	Rate
5	53.0%
10	65.0%
15	85.0%
20	95.0%
25	100.0%
30	100.0%

Rates of Salary Increase* (effective June 30, 2018)

	Annual Increase			
Years of Service	State	School	Other	Sheriffs/Deputies and Protection Occupation
1	14.25%	16.25%	14.25%	16.25%
5	7.75%	5.75%	5.35%	5.75%
10	5.50%	4.55%	4.55%	4.55%
15	4.45%	3.75%	4.05%	4.05%
20	3.85%	3.40%	3.75%	3.75%
25	3.60%	3.25%	3.65%	3.75%
30	3.35%	3.25%	3.65%	3.25%
35+	3.25%	3.25%	3.25%	3.25%

* Includes 3.25 % wage growth

APPENDIX E

MORTALITY

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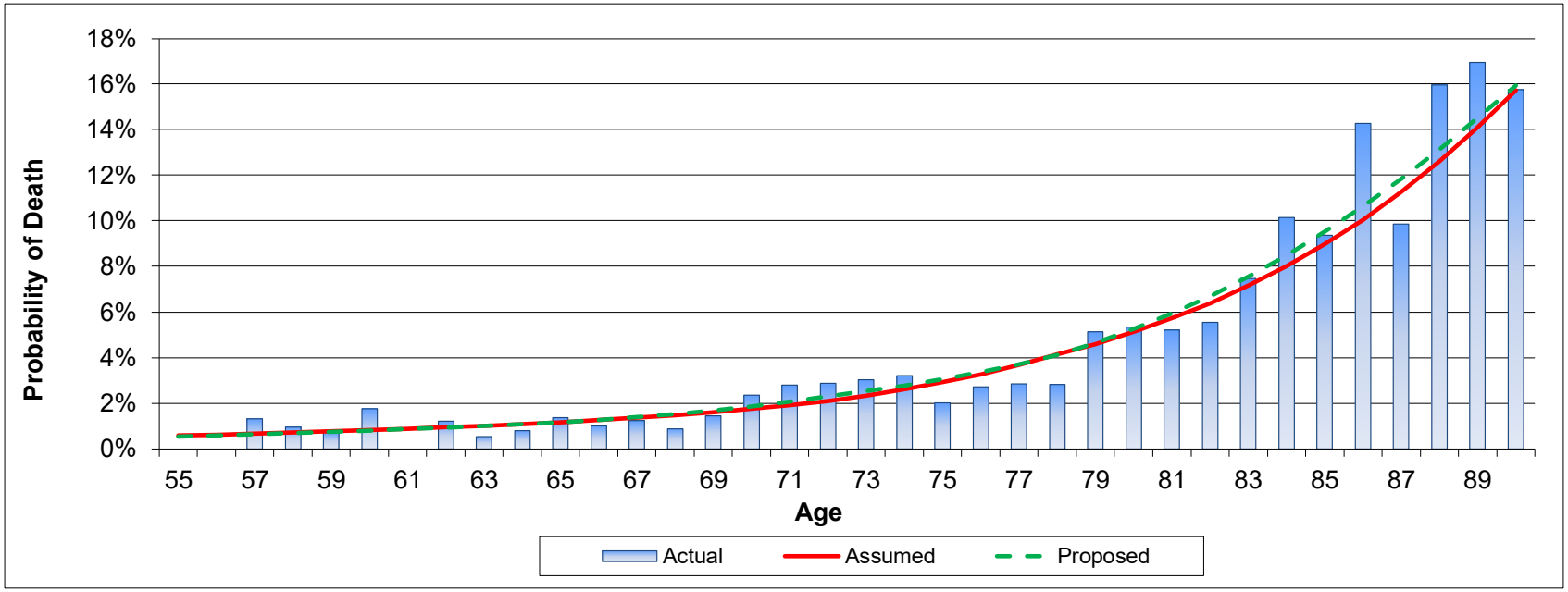
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-1

Probability of Death - Healthy Retirees

Males - State Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	777	740	771
Actual/Expected		105%	101%

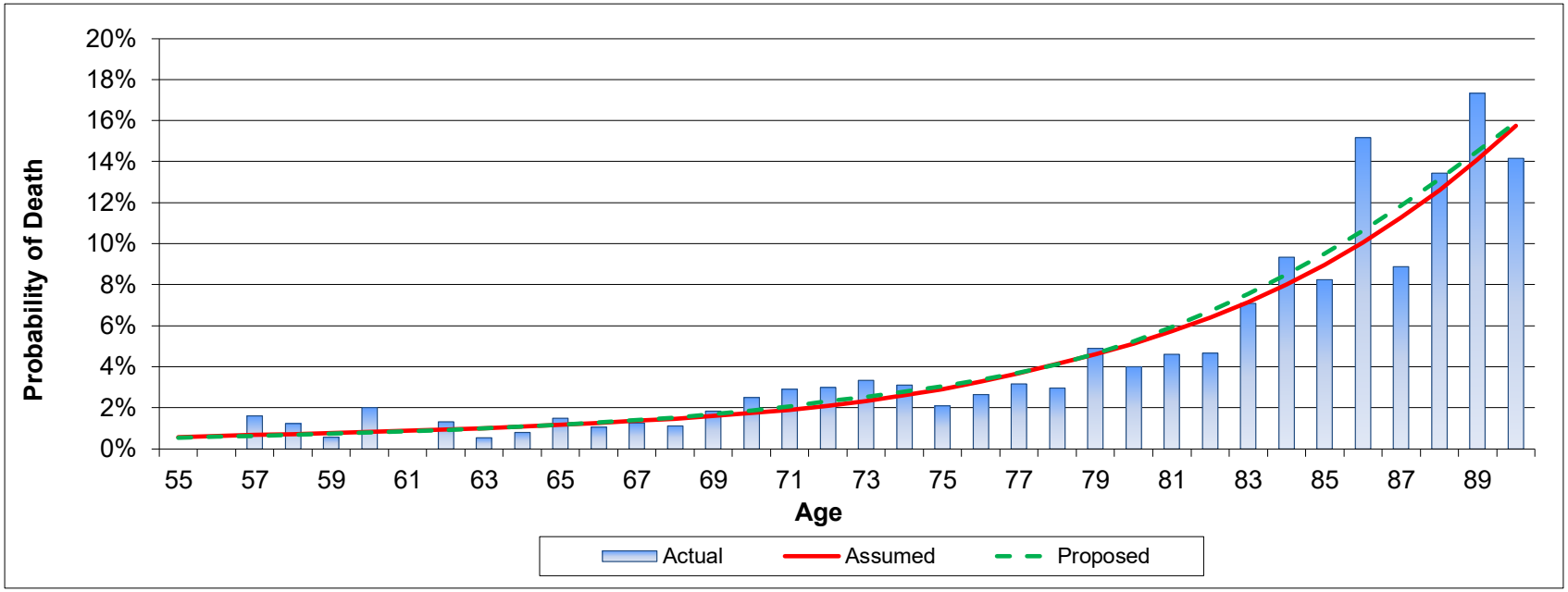
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-2

Probability of Death - Healthy Retirees

Males - State Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighed Count	16,486,762	15,724,029	16,391,128
Actual/Expected		105%	101%

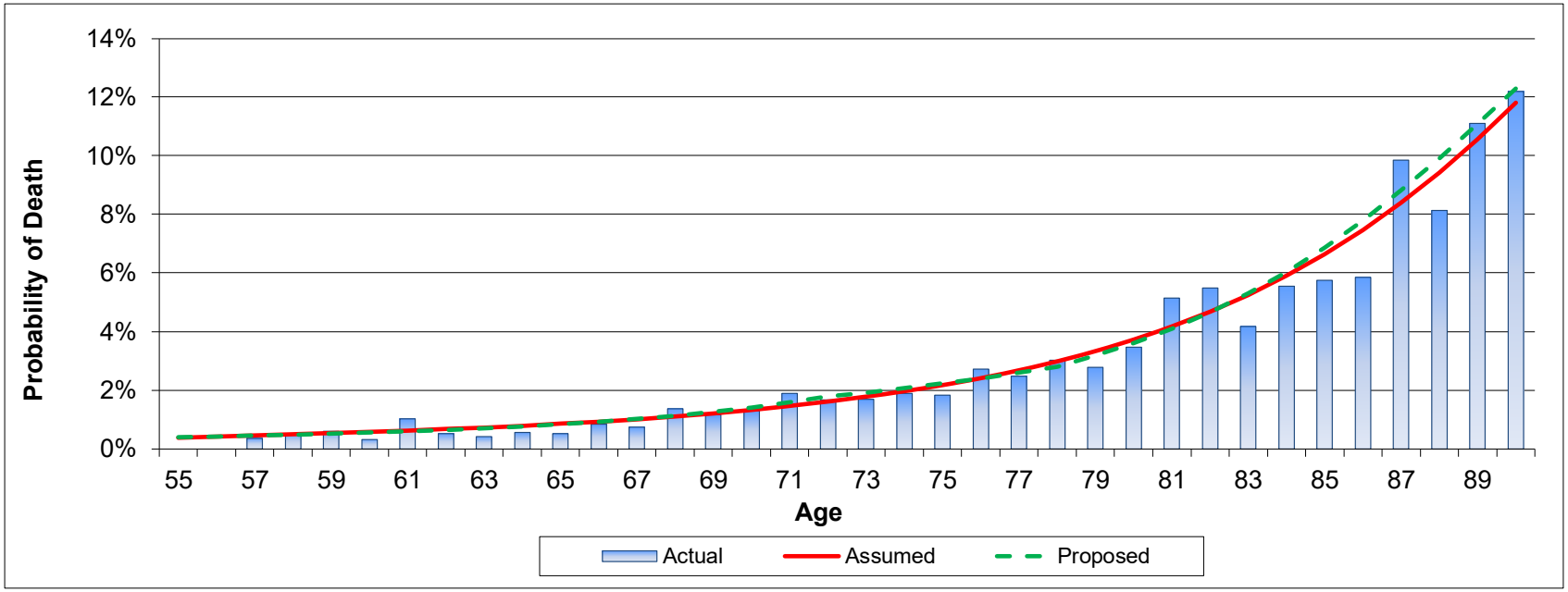
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-3

Probability of Death - Healthy Retirees

Females - State Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	707	726	742
Actual/Expected		97%	95%

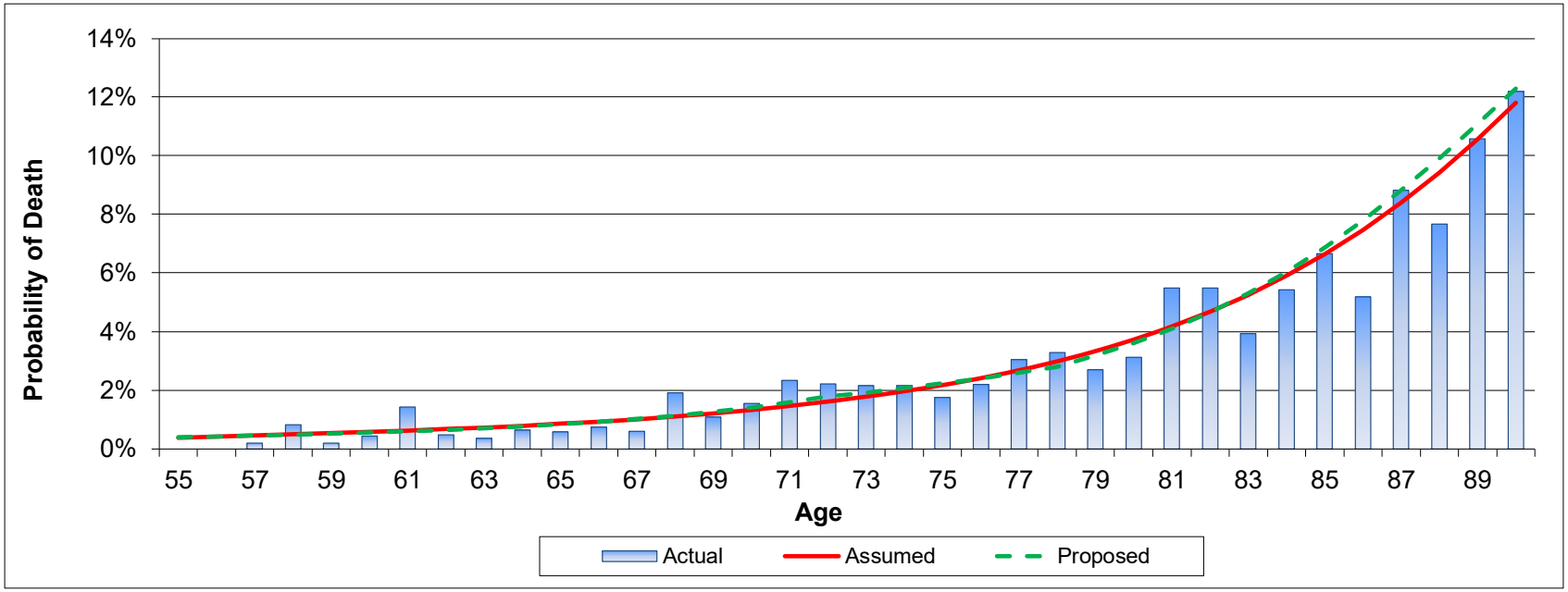
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-4

Probability of Death - Healthy Retirees

Females - State Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighed Count	11,976,264	11,585,568	11,809,707
Actual/Expected		103%	101%

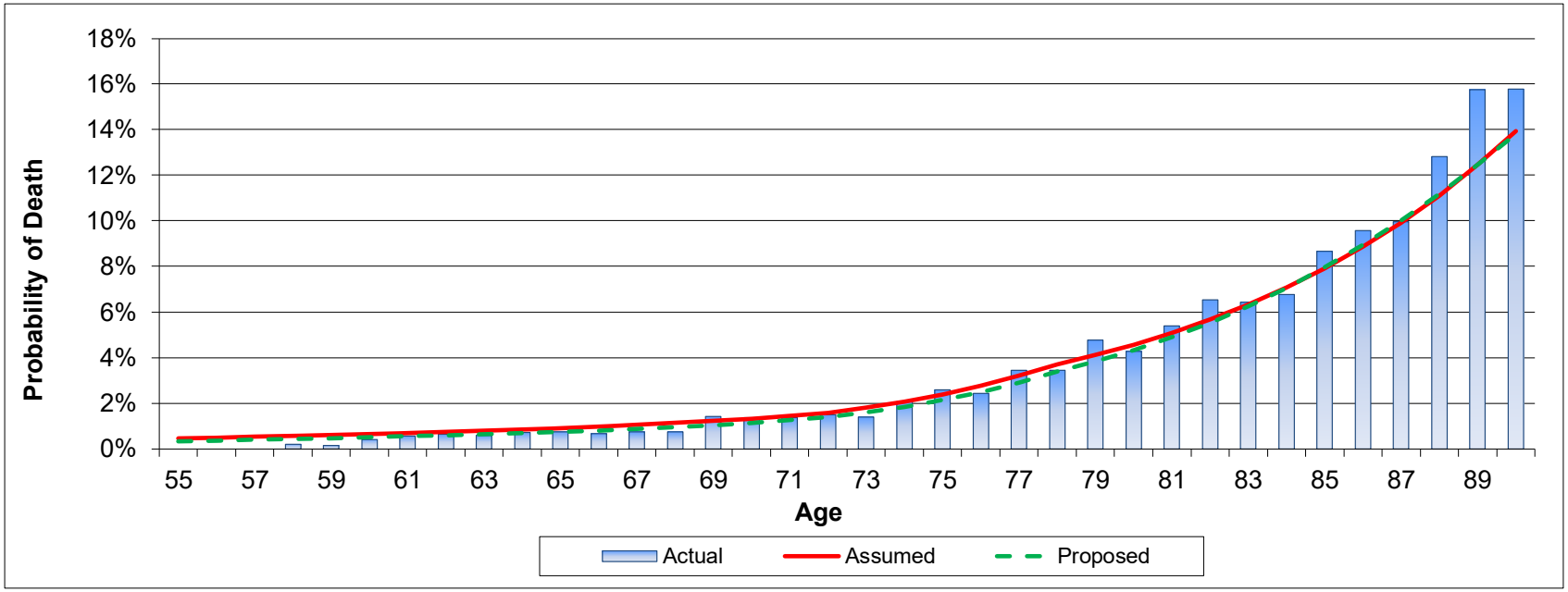
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-5

Probability of Death - Healthy Retirees

Males - School Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,893	1,861	1,749
Actual/Expected		102%	108%

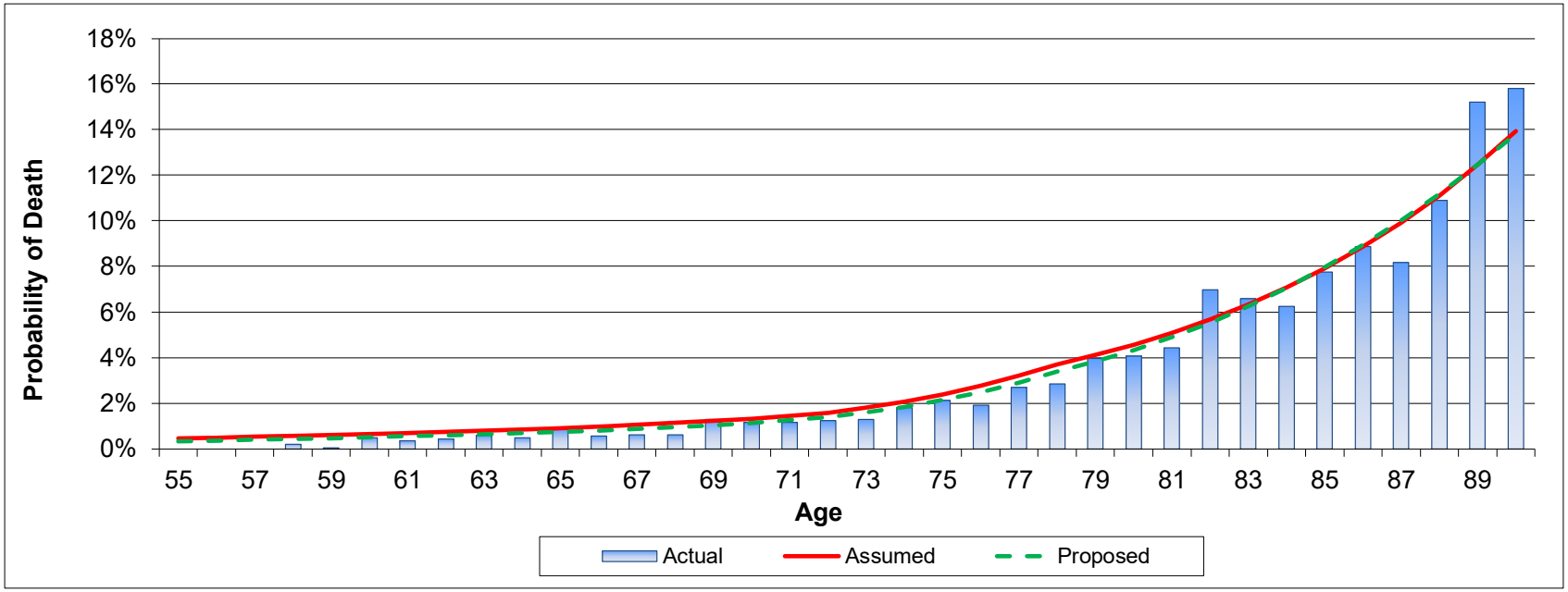
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-6

Probability of Death - Healthy Retirees

Males - School Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighed Count	28,189,676	32,250,405	29,691,142
Actual/Expected		87%	95%

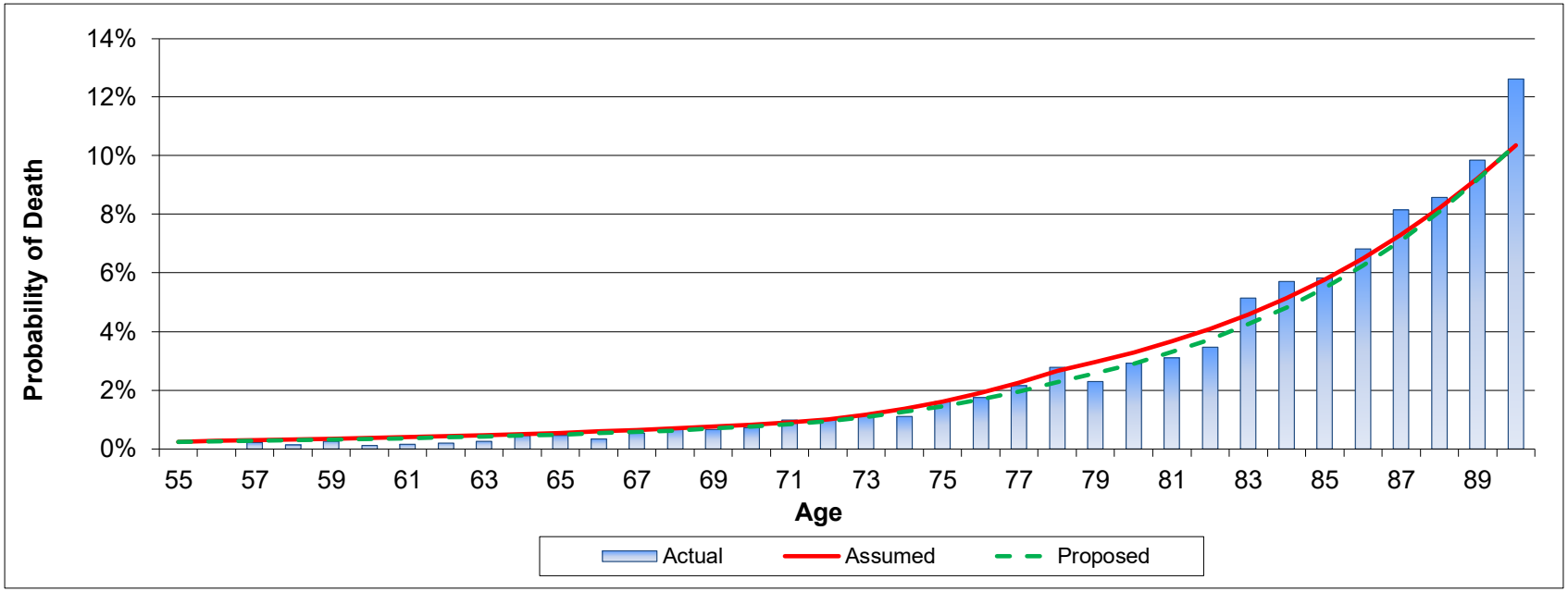
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-7

Probability of Death - Healthy Retirees

Females - School Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	2,933	3,000	2,787
Actual/Expected		98%	105%

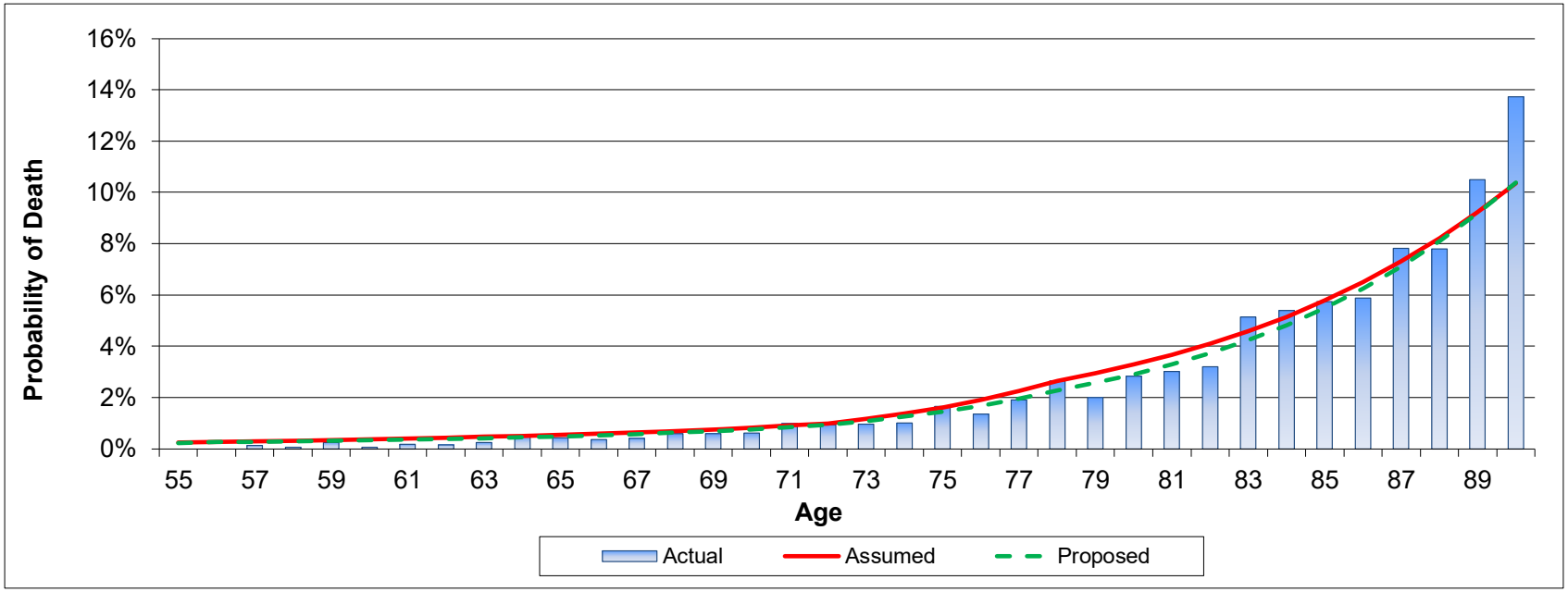
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-8

Probability of Death - Healthy Retirees

Females - School Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighed Count	33,211,634	37,544,174	34,599,458
Actual/Expected		88%	96%

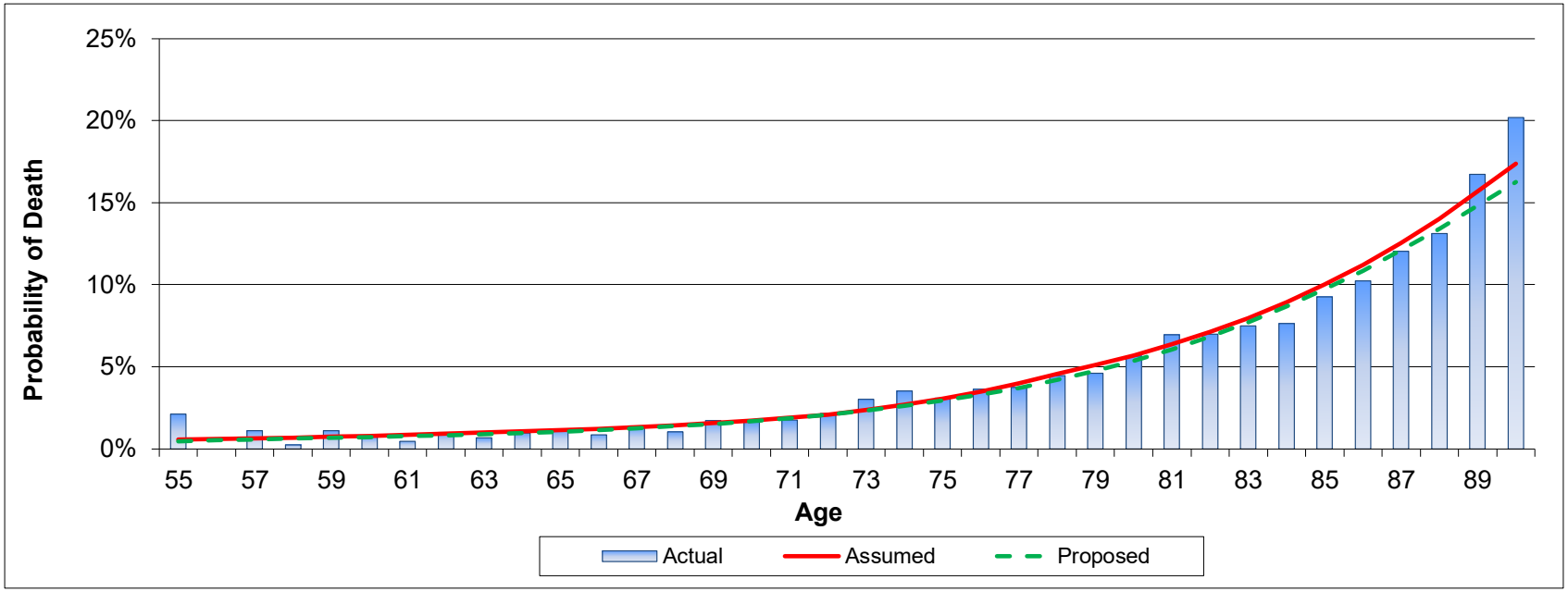
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-9

Probability of Death - Healthy Retirees

Males - Other Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,879	1,896	1,812
Actual/Expected		99%	104%

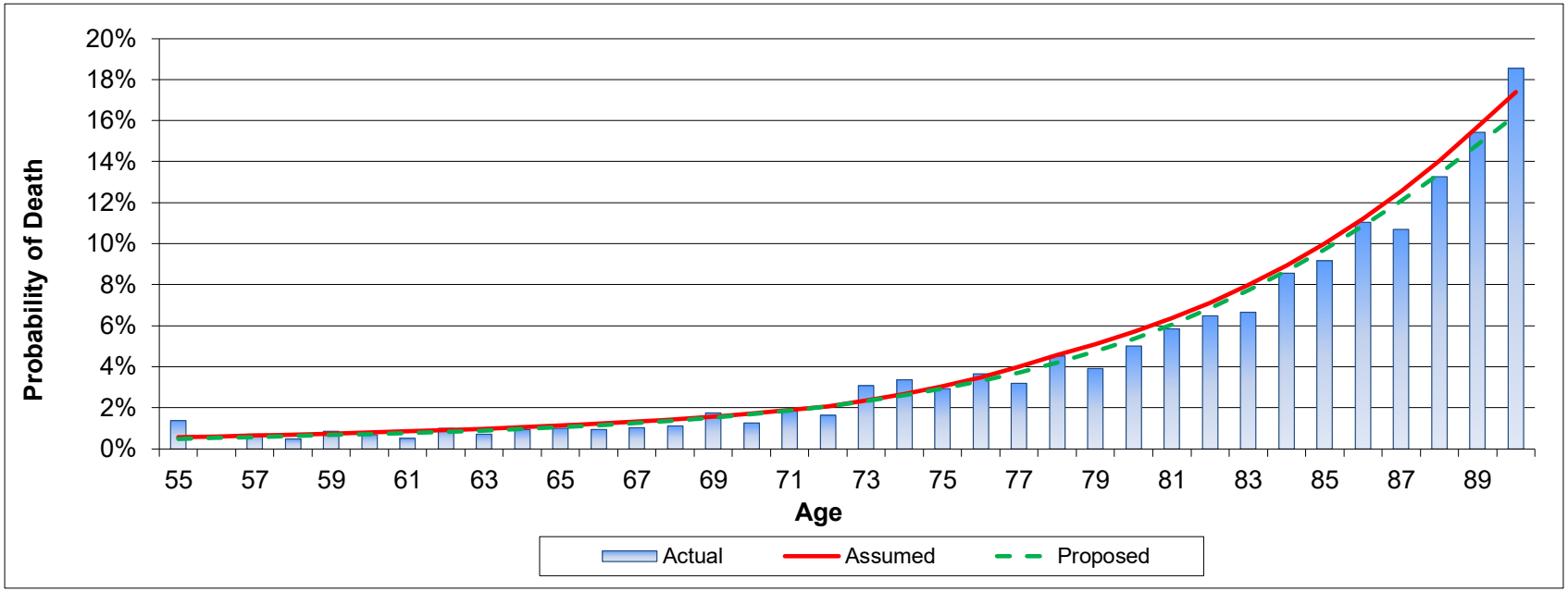
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-10

Probability of Death - Healthy Retirees

Males - Other Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighed Count	23,971,781	25,774,731	24,620,821
Actual/Expected		93%	97%

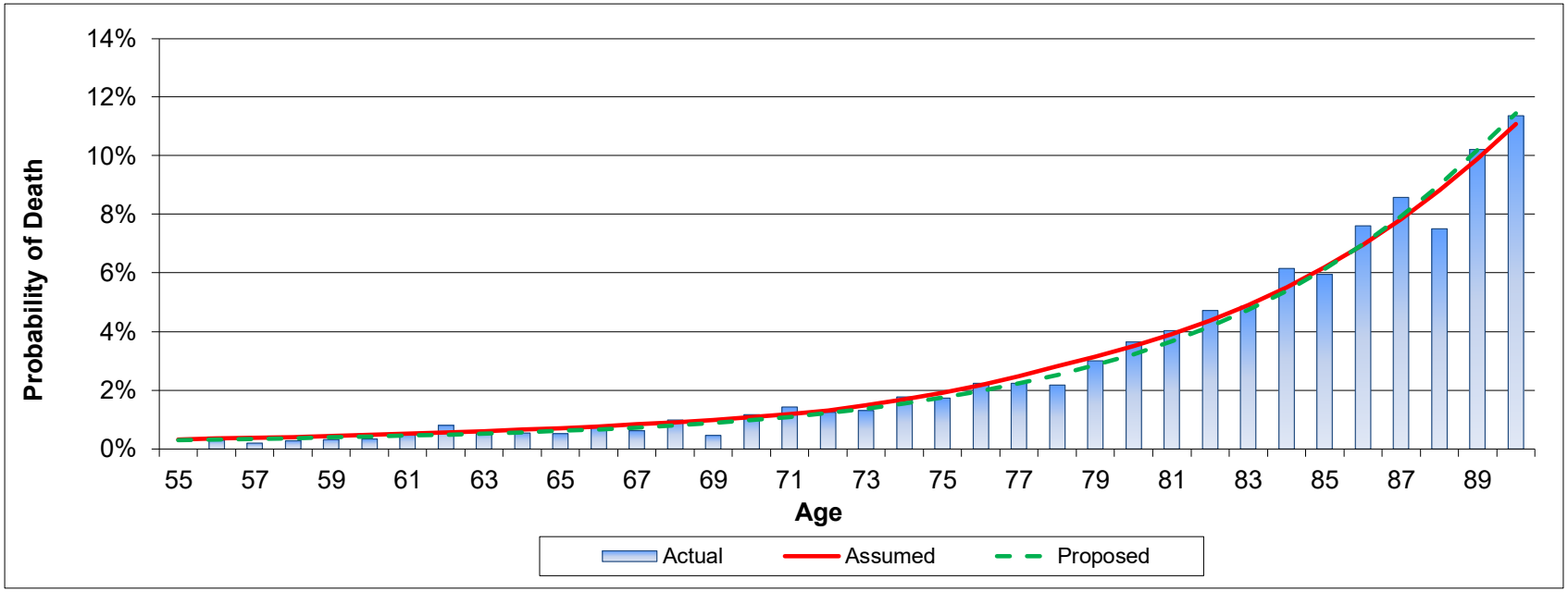
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-11

Probability of Death - Healthy Retirees

Females - Other Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,888	1,918	1,822
Actual/Expected		98%	104%

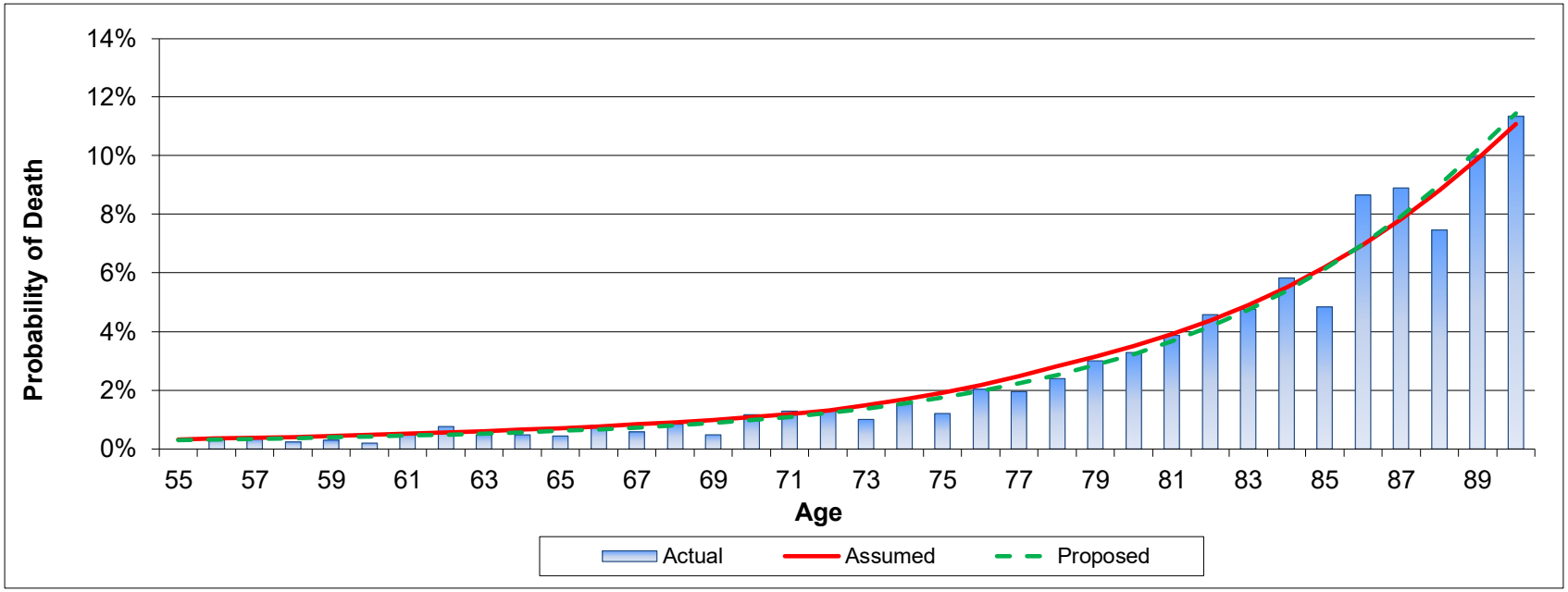
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-12

Probability of Death - Healthy Retirees

Females - Other Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighed Count	16,106,832	17,597,721	16,393,044
Actual/Expected		92%	98%

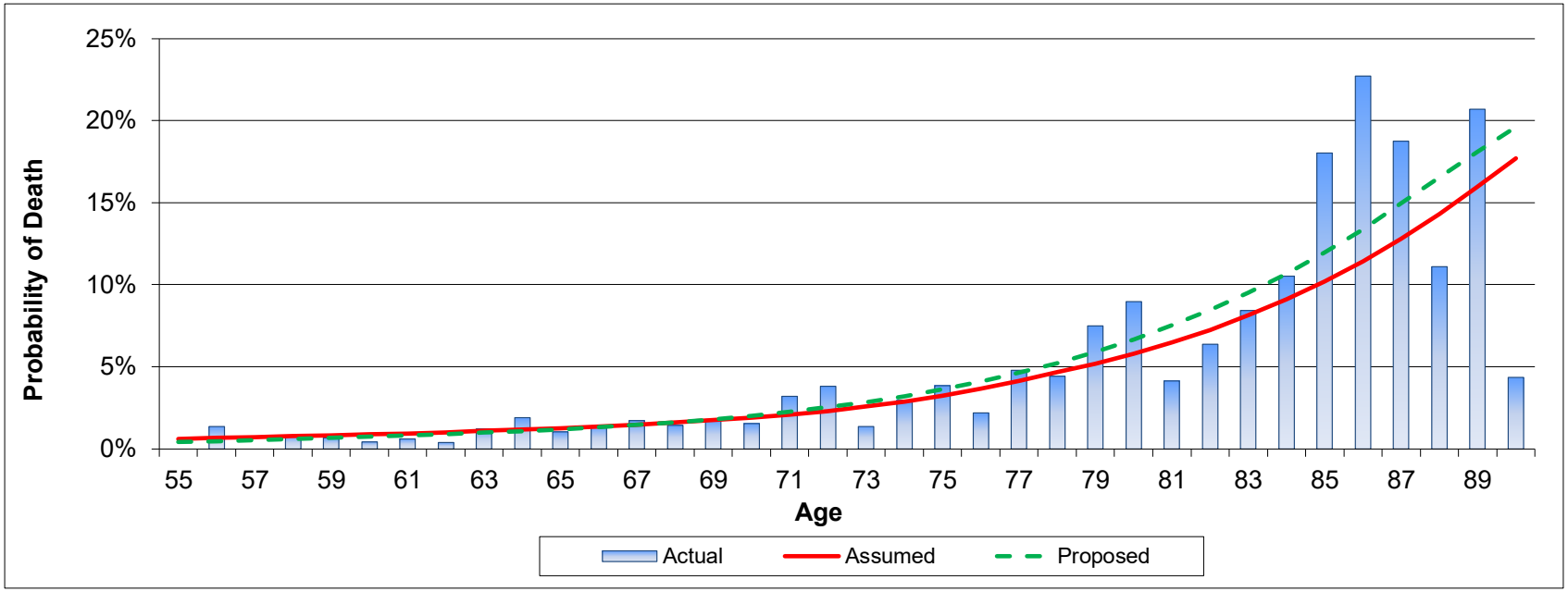
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-13

Probability of Death - Healthy Retirees

Males - Special Services Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	261	244	258
Actual/Expected		107%	101%

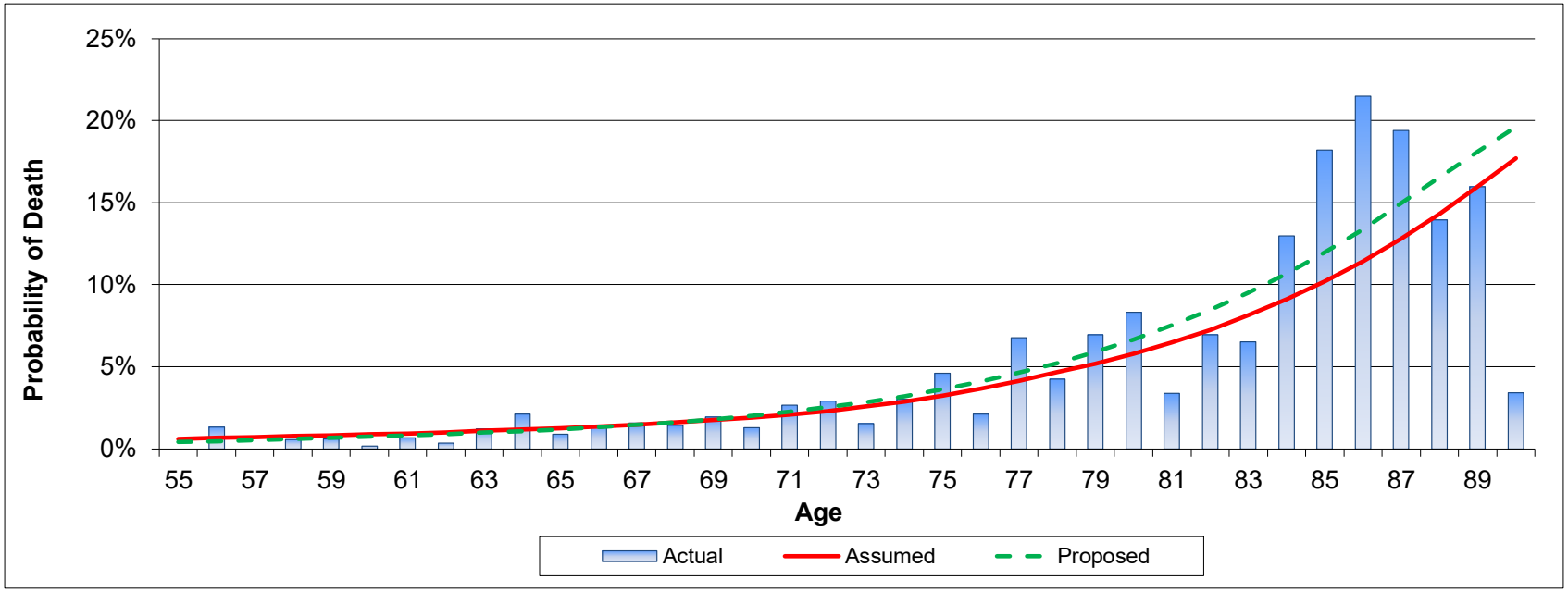
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-14

Probability of Death - Healthy Retirees

Males - Special Services Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighed Count	5,758,925	5,710,519	5,862,710
Actual/Expected		101%	98%

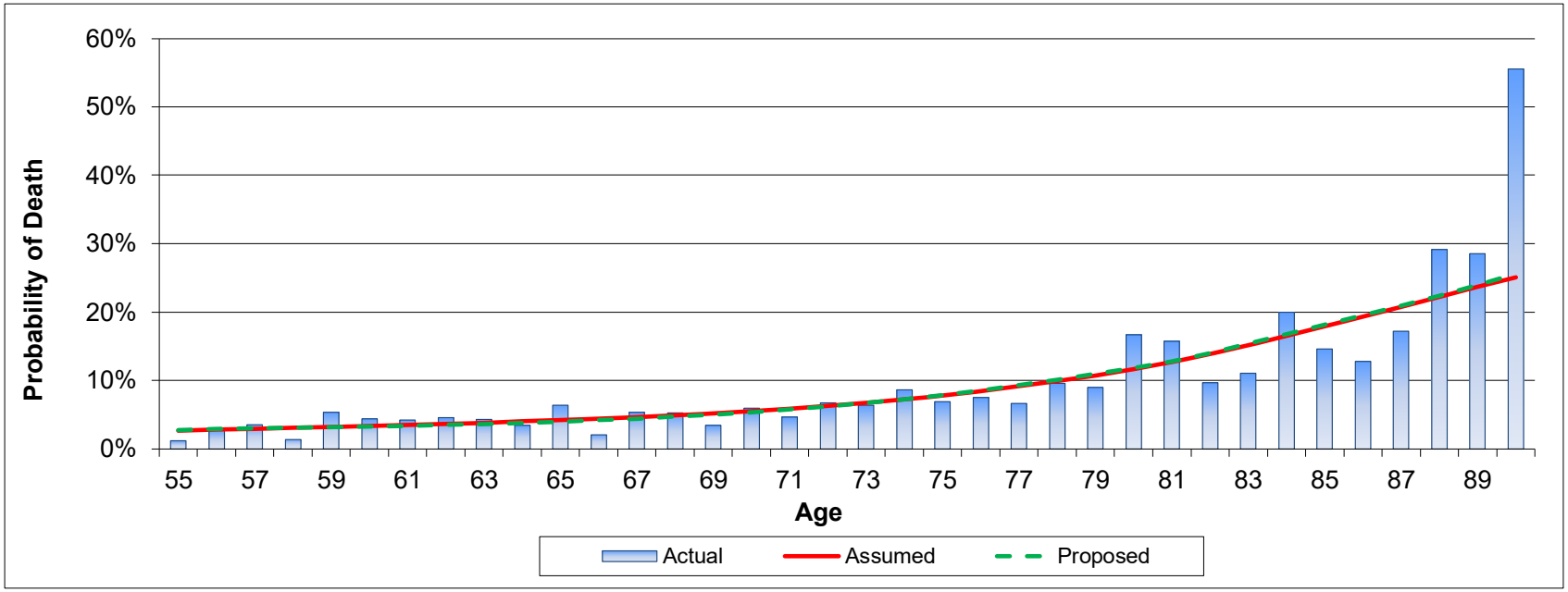
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-15

Probability of Death - Disabled Retirees

Males - Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	328	325	322
Actual/Expected		101%	102%

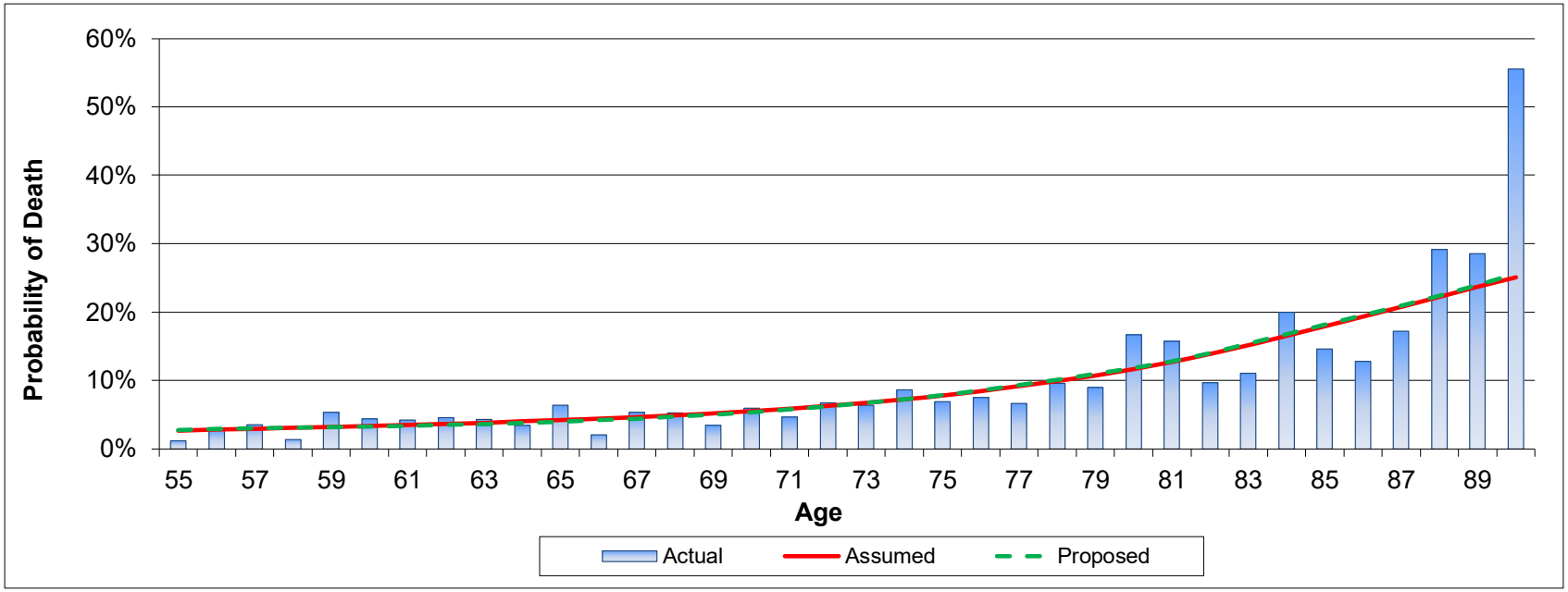
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-16

Probability of Death - Disabled Retirees

Males - Regular Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	328	325	322
Actual/Expected		101%	102%

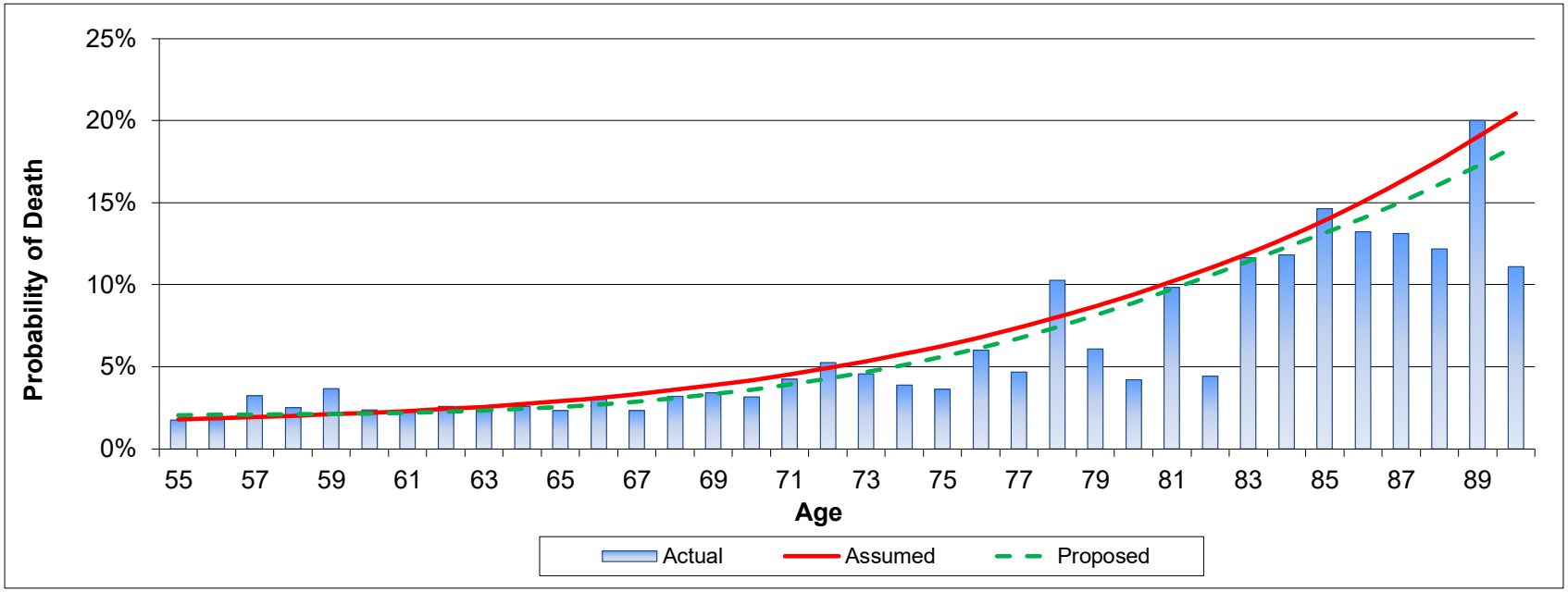
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-17

Probability of Death - Disabled Retirees

Females - Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	366	411	377
Actual/Expected		89%	97%

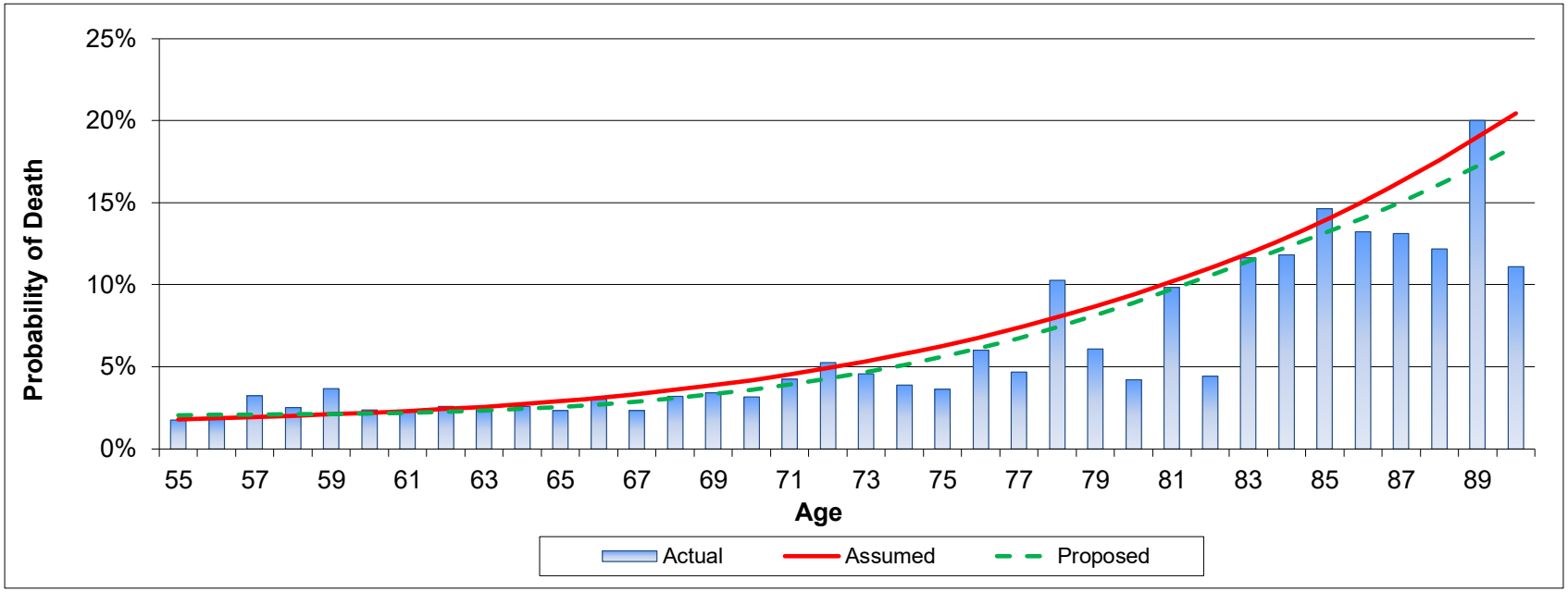
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit E-18

Probability of Death - Disabled Retirees

Females - Regular Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	366	411	377
Actual/Expected		89%	97%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-1

Probability of Death - Healthy Retirees

Males - State Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	22	-	0.0%	0.1	0.6%	0.1	0.5%
56	99	-	0.0%	0.6	0.6%	0.6	0.6%
57	150	2	1.3%	1.0	0.7%	1.0	0.6%
58	207	2	1.0%	1.5	0.7%	1.4	0.7%
59	279	2	0.7%	2.1	0.8%	2.1	0.7%
60	341	6	1.8%	2.8	0.8%	2.7	0.8%
61	450	-	0.0%	3.9	0.9%	3.9	0.9%
62	576	7	1.2%	5.4	0.9%	5.3	0.9%
63	732	4	0.5%	7.4	1.0%	7.3	1.0%
64	876	7	0.8%	9.5	1.1%	9.4	1.1%
65	1,016	14	1.4%	11.9	1.2%	11.9	1.2%
66	1,192	12	1.0%	15.0	1.3%	15.2	1.3%
67	1,287	16	1.2%	17.5	1.4%	17.9	1.4%
68	1,345	12	0.9%	19.8	1.5%	20.6	1.5%
69	1,381	20	1.4%	22.1	1.6%	23.3	1.7%
70	1,361	32	2.4%	23.7	1.7%	25.4	1.9%
71	1,394	39	2.8%	26.6	1.9%	28.9	2.1%
72	1,279	37	2.9%	26.7	2.1%	29.6	2.3%
73	1,122	34	3.0%	26.1	2.3%	28.4	2.5%
74	998	32	3.2%	26.0	2.6%	27.7	2.8%
75	890	18	2.0%	25.9	2.9%	27.2	3.1%
76	811	22	2.7%	26.5	3.3%	27.3	3.4%
77	734	21	2.9%	26.9	3.7%	27.3	3.7%
78	671	19	2.8%	27.7	4.1%	27.6	4.1%
79	583	30	5.1%	26.8	4.6%	27.1	4.6%
80	541	29	5.4%	27.7	5.1%	28.4	5.3%
81	499	26	5.2%	28.5	5.7%	29.6	5.9%
82	486	27	5.6%	31.0	6.4%	32.6	6.7%
83	495	37	7.5%	35.4	7.1%	37.4	7.6%
84	434	44	10.1%	34.8	8.0%	36.9	8.5%
85	406	38	9.4%	36.4	9.0%	38.6	9.5%
86	350	50	14.3%	35.2	10.0%	37.2	10.6%
87	294	29	9.9%	33.1	11.3%	34.8	11.8%
88	263	42	16.0%	33.1	12.6%	34.5	13.1%
89	224	38	17.0%	31.6	14.1%	32.5	14.5%
90	184	29	15.8%	29.0	15.7%	29.3	15.9%
	23,972	777	3.2%	739.6	3.1%	771.0	3.2%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-2

Probability of Death - Healthy Retirees

Males - State Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	584,953	-	0.0%	3,434.3	0.6%	3,129.1	0.5%
56	3,106,028	-	0.0%	19,446.8	0.6%	18,104.3	0.6%
57	4,727,852	76,828	1.6%	31,596.2	0.7%	30,013.5	0.6%
58	6,672,897	83,194	1.2%	47,637.8	0.7%	45,914.1	0.7%
59	9,319,566	54,402	0.6%	71,173.5	0.8%	69,268.2	0.7%
60	11,742,218	235,970	2.0%	96,074.8	0.8%	94,110.1	0.8%
61	15,201,863	-	0.0%	133,365.9	0.9%	130,868.0	0.9%
62	18,846,796	248,243	1.3%	177,442.6	0.9%	174,377.3	0.9%
63	23,438,119	126,067	0.5%	237,053.1	1.0%	233,589.9	1.0%
64	27,745,423	226,679	0.8%	301,648.2	1.1%	298,811.5	1.1%
65	31,217,674	469,394	1.5%	365,184.4	1.2%	364,898.4	1.2%
66	35,338,650	375,231	1.1%	445,337.7	1.3%	450,050.4	1.3%
67	38,520,989	484,559	1.3%	524,001.0	1.4%	537,048.8	1.4%
68	40,156,867	449,491	1.1%	591,350.0	1.5%	615,151.8	1.5%
69	41,067,146	760,158	1.9%	656,910.1	1.6%	693,362.9	1.7%
70	39,819,541	998,859	2.5%	694,094.4	1.7%	744,117.3	1.9%
71	39,860,106	1,158,039	2.9%	759,534.3	1.9%	827,055.7	2.1%
72	35,143,120	1,056,850	3.0%	734,245.2	2.1%	812,911.0	2.3%
73	29,548,208	992,240	3.4%	688,043.7	2.3%	747,911.3	2.5%
74	24,879,198	773,340	3.1%	647,255.4	2.6%	691,048.1	2.8%
75	21,185,679	445,724	2.1%	616,858.7	2.9%	647,256.2	3.1%
76	18,977,244	505,786	2.7%	619,793.4	3.3%	638,910.4	3.4%
77	16,799,233	533,971	3.2%	616,676.9	3.7%	624,201.9	3.7%
78	14,501,752	430,326	3.0%	599,402.0	4.1%	595,537.6	4.1%
79	11,961,302	586,424	4.9%	550,021.2	4.6%	555,241.8	4.6%
80	10,650,817	425,684	4.0%	545,796.3	5.1%	559,318.1	5.3%
81	9,268,030	428,447	4.6%	530,082.1	5.7%	550,007.5	5.9%
82	8,981,811	418,892	4.7%	573,810.9	6.4%	601,872.5	6.7%
83	8,627,583	612,749	7.1%	616,632.4	7.1%	651,753.9	7.6%
84	7,217,803	674,186	9.3%	577,951.1	8.0%	612,898.3	8.5%
85	6,607,684	544,588	8.2%	592,646.1	9.0%	628,734.3	9.5%
86	5,142,238	779,845	15.2%	516,707.2	10.0%	546,611.4	10.6%
87	3,874,178	344,389	8.9%	436,203.9	11.3%	458,601.2	11.8%
88	3,320,220	446,316	13.4%	418,448.5	12.6%	435,971.6	13.1%
89	2,593,569	449,469	17.3%	365,558.4	14.1%	376,083.3	14.5%
90	2,048,990	290,422	14.2%	322,610.8	15.7%	326,386.2	15.9%
	628,695,347	16,486,762	2.6%	15,724,029.3	2.5%	16,391,128.3	2.6%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-3

Probability of Death - Healthy Retirees

Females - State Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	51	-	0.0%	0.2	0.4%	0.2	0.4%
56	175	-	0.0%	0.7	0.4%	0.7	0.4%
57	280	1	0.4%	1.3	0.5%	1.3	0.5%
58	378	2	0.5%	1.8	0.5%	1.8	0.5%
59	493	3	0.6%	2.6	0.5%	2.5	0.5%
60	623	2	0.3%	3.6	0.6%	3.5	0.6%
61	784	8	1.0%	4.9	0.6%	4.7	0.6%
62	960	5	0.5%	6.4	0.7%	6.2	0.6%
63	1,199	5	0.4%	8.7	0.7%	8.4	0.7%
64	1,409	8	0.6%	11.1	0.8%	10.8	0.8%
65	1,518	8	0.5%	12.9	0.9%	12.7	0.8%
66	1,671	14	0.8%	15.4	0.9%	15.4	0.9%
67	1,746	13	0.7%	17.6	1.0%	17.7	1.0%
68	1,746	24	1.4%	19.2	1.1%	19.7	1.1%
69	1,712	20	1.2%	20.6	1.2%	21.6	1.3%
70	1,686	22	1.3%	22.3	1.3%	23.8	1.4%
71	1,687	32	1.9%	24.6	1.5%	26.7	1.6%
72	1,495	25	1.7%	24.1	1.6%	26.7	1.8%
73	1,354	23	1.7%	24.1	1.8%	26.0	1.9%
74	1,218	23	1.9%	24.0	2.0%	25.2	2.1%
75	1,084	20	1.8%	23.6	2.2%	24.1	2.2%
76	1,027	28	2.7%	24.8	2.4%	24.7	2.4%
77	930	23	2.5%	25.0	2.7%	24.1	2.6%
78	823	25	3.0%	24.6	3.0%	23.0	2.8%
79	755	21	2.8%	25.1	3.3%	24.0	3.2%
80	691	24	3.5%	25.7	3.7%	24.9	3.6%
81	660	34	5.2%	27.5	4.2%	27.0	4.1%
82	620	34	5.5%	29.0	4.7%	28.9	4.7%
83	551	23	4.2%	28.9	5.2%	29.2	5.3%
84	505	28	5.5%	29.8	5.9%	30.5	6.0%
85	486	28	5.8%	32.3	6.6%	33.4	6.9%
86	444	26	5.9%	33.1	7.5%	34.6	7.8%
87	426	42	9.9%	35.7	8.4%	37.5	8.8%
88	393	32	8.1%	37.0	9.4%	39.0	9.9%
89	369	41	11.1%	38.9	10.6%	40.9	11.1%
90	328	40	12.2%	38.7	11.8%	40.3	12.3%
	32,277	707	2.2%	726.0	2.2%	741.7	2.3%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-4

Probability of Death - Healthy Retirees

Females - State Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	1,173,463	-	0.0%	4,524.9	0.4%	4,645.5	0.4%
56	4,556,390	-	0.0%	19,004.7	0.4%	19,229.8	0.4%
57	7,980,326	15,301	0.2%	36,039.2	0.5%	35,997.7	0.5%
58	11,867,344	98,560	0.8%	58,055.0	0.5%	57,219.6	0.5%
59	15,689,444	32,977	0.2%	83,154.1	0.5%	81,145.8	0.5%
60	19,870,067	88,962	0.4%	113,994.6	0.6%	110,445.8	0.6%
61	24,529,120	351,354	1.4%	152,276.8	0.6%	147,263.0	0.6%
62	29,018,363	142,940	0.5%	194,829.3	0.7%	188,108.6	0.6%
63	35,339,141	126,745	0.4%	256,562.2	0.7%	248,674.5	0.7%
64	40,222,936	262,554	0.7%	315,951.2	0.8%	307,946.8	0.8%
65	41,669,497	244,978	0.6%	354,649.1	0.9%	348,573.7	0.8%
66	43,798,485	325,014	0.7%	404,829.4	0.9%	402,648.2	0.9%
67	44,505,642	273,758	0.6%	448,038.3	1.0%	452,248.5	1.0%
68	44,139,320	846,393	1.9%	485,576.7	1.1%	497,997.5	1.1%
69	41,722,094	455,734	1.1%	503,043.3	1.2%	525,247.8	1.3%
70	39,112,816	608,218	1.6%	518,283.9	1.3%	551,678.4	1.4%
71	37,491,461	881,025	2.3%	547,037.9	1.5%	594,269.7	1.6%
72	31,793,148	704,952	2.2%	511,742.5	1.6%	567,736.6	1.8%
73	27,356,221	592,516	2.2%	486,557.7	1.8%	525,463.5	1.9%
74	23,827,927	514,616	2.2%	468,671.5	2.0%	492,508.6	2.1%
75	19,885,848	351,191	1.8%	433,213.2	2.2%	442,768.6	2.2%
76	17,833,442	391,704	2.2%	430,713.3	2.4%	428,156.7	2.4%
77	15,600,157	475,462	3.0%	418,583.4	2.7%	404,021.6	2.6%
78	12,930,339	425,163	3.3%	386,087.0	3.0%	361,710.7	2.8%
79	11,189,694	303,379	2.7%	372,605.6	3.3%	355,113.9	3.2%
80	9,349,373	293,211	3.1%	347,871.5	3.7%	336,989.7	3.6%
81	8,424,739	462,203	5.5%	351,033.6	4.2%	345,053.7	4.1%
82	7,553,231	414,429	5.5%	352,924.7	4.7%	351,900.5	4.7%
83	6,432,117	253,180	3.9%	337,544.6	5.2%	340,989.7	5.3%
84	5,632,153	306,127	5.4%	332,285.8	5.9%	339,862.1	6.0%
85	5,053,876	336,664	6.7%	335,380.3	6.6%	346,845.0	6.9%
86	4,207,923	218,428	5.2%	314,066.7	7.5%	327,867.1	7.8%
87	3,672,298	323,808	8.8%	308,098.5	8.4%	323,629.0	8.8%
88	3,312,418	254,406	7.7%	312,016.5	9.4%	328,460.0	9.9%
89	2,922,064	309,036	10.6%	308,359.6	10.6%	323,835.4	11.1%
90	2,386,935	291,276	12.2%	281,961.5	11.8%	293,454.1	12.3%
	702,049,812	11,976,264	1.7%	11,585,567.9	1.7%	11,809,707.3	1.7%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-5

Probability of Death - Healthy Retirees

Males - School Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	38	-	0.0%	0.2	0.5%	0.1	0.3%
56	174	-	0.0%	0.9	0.5%	0.6	0.4%
57	326	-	0.0%	1.7	0.5%	1.3	0.4%
58	466	1	0.2%	2.6	0.6%	2.0	0.4%
59	610	1	0.2%	3.7	0.6%	2.9	0.5%
60	714	3	0.4%	4.6	0.6%	3.6	0.5%
61	875	5	0.6%	6.0	0.7%	4.8	0.6%
62	1,094	7	0.6%	8.1	0.7%	6.5	0.6%
63	1,498	9	0.6%	11.8	0.8%	9.6	0.6%
64	1,790	13	0.7%	15.2	0.8%	12.3	0.7%
65	2,094	16	0.8%	19.1	0.9%	15.5	0.7%
66	2,522	17	0.7%	24.7	1.0%	20.1	0.8%
67	2,837	21	0.7%	29.9	1.1%	24.6	0.9%
68	3,101	23	0.7%	35.2	1.1%	29.3	0.9%
69	3,265	47	1.4%	40.0	1.2%	33.7	1.0%
70	3,401	47	1.4%	45.1	1.3%	38.6	1.1%
71	3,469	48	1.4%	49.9	1.4%	43.4	1.3%
72	3,255	49	1.5%	51.1	1.6%	45.1	1.4%
73	3,090	43	1.4%	55.6	1.8%	49.3	1.6%
74	2,885	60	2.1%	59.7	2.1%	53.2	1.8%
75	2,707	70	2.6%	64.6	2.4%	58.0	2.1%
76	2,625	64	2.4%	72.5	2.8%	65.4	2.5%
77	2,492	86	3.5%	79.7	3.2%	72.4	2.9%
78	2,255	78	3.5%	83.7	3.7%	76.6	3.4%
79	2,110	101	4.8%	86.8	4.1%	80.8	3.8%
80	1,933	83	4.3%	88.4	4.6%	83.6	4.3%
81	1,835	99	5.4%	93.3	5.1%	89.7	4.9%
82	1,700	111	6.5%	96.3	5.7%	94.0	5.5%
83	1,540	99	6.4%	97.4	6.3%	96.2	6.2%
84	1,402	95	6.8%	99.1	7.1%	98.9	7.1%
85	1,247	108	8.7%	98.6	7.9%	99.2	8.0%
86	1,108	106	9.6%	98.1	8.9%	99.0	8.9%
87	963	96	10.0%	95.5	9.9%	96.5	10.0%
88	803	103	12.8%	89.2	11.1%	89.9	11.2%
89	635	100	15.7%	79.1	12.5%	79.1	12.5%
90	532	84	15.8%	74.2	13.9%	73.5	13.8%
	63,391	1,893	3.0%	1,861.3	2.9%	1,749.0	2.8%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-6

Probability of Death - Healthy Retirees

Males - School Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	860,639	-	0.0%	3,989.8	0.5%	2,862.8	0.3%
56	4,639,443	-	0.0%	22,981.9	0.5%	16,843.0	0.4%
57	9,735,028	-	0.0%	51,438.9	0.5%	38,574.1	0.4%
58	14,757,300	31,667	0.2%	83,155.9	0.6%	63,716.1	0.4%
59	20,257,861	11,909	0.1%	121,845.0	0.6%	95,260.6	0.5%
60	23,312,874	113,360	0.5%	149,787.5	0.6%	118,821.1	0.5%
61	27,922,028	97,690	0.3%	191,916.5	0.7%	153,727.5	0.6%
62	33,775,691	147,525	0.4%	248,717.4	0.7%	200,519.5	0.6%
63	43,915,684	261,306	0.6%	346,745.1	0.8%	280,041.5	0.6%
64	51,941,363	258,289	0.5%	440,125.1	0.8%	355,985.3	0.7%
65	60,185,372	524,343	0.9%	547,843.4	0.9%	444,312.5	0.7%
66	69,333,340	386,945	0.6%	678,412.9	1.0%	553,113.7	0.8%
67	75,922,653	471,682	0.6%	799,328.9	1.1%	657,368.7	0.9%
68	81,893,910	504,201	0.6%	928,824.3	1.1%	772,554.4	0.9%
69	83,776,165	1,080,051	1.3%	1,025,646.5	1.2%	865,173.2	1.0%
70	83,682,336	983,716	1.2%	1,109,075.5	1.3%	949,560.2	1.1%
71	80,460,986	940,385	1.2%	1,158,348.5	1.4%	1,006,277.3	1.3%
72	73,186,605	907,093	1.2%	1,148,144.1	1.6%	1,013,078.3	1.4%
73	66,788,968	874,668	1.3%	1,201,653.7	1.8%	1,065,415.4	1.6%
74	60,994,778	1,112,550	1.8%	1,262,357.1	2.1%	1,125,809.5	1.8%
75	54,865,267	1,168,765	2.1%	1,309,752.6	2.4%	1,174,954.5	2.1%
76	51,290,261	989,451	1.9%	1,415,791.5	2.8%	1,278,045.9	2.5%
77	47,666,335	1,291,702	2.7%	1,524,046.8	3.2%	1,385,224.7	2.9%
78	40,861,553	1,166,741	2.9%	1,516,666.4	3.7%	1,387,494.9	3.4%
79	37,622,089	1,496,678	4.0%	1,548,344.6	4.1%	1,440,361.7	3.8%
80	32,883,066	1,336,898	4.1%	1,503,216.5	4.6%	1,421,469.2	4.3%
81	30,055,108	1,334,554	4.4%	1,528,518.6	5.1%	1,468,582.7	4.9%
82	26,898,854	1,880,929	7.0%	1,524,519.4	5.7%	1,486,914.9	5.5%
83	22,708,462	1,497,858	6.6%	1,436,464.6	6.3%	1,418,552.2	6.2%
84	19,380,233	1,213,814	6.3%	1,369,353.0	7.1%	1,367,023.5	7.1%
85	15,805,764	1,226,500	7.8%	1,249,407.7	7.9%	1,256,858.5	8.0%
86	13,408,831	1,189,247	8.9%	1,187,486.1	8.9%	1,198,535.0	8.9%
87	11,021,294	901,489	8.2%	1,093,277.1	9.9%	1,103,892.8	10.0%
88	8,688,317	948,096	10.9%	965,560.5	11.1%	972,161.9	11.2%
89	6,649,064	1,011,446	15.2%	827,984.0	12.5%	828,500.0	12.5%
90	5,234,848	828,128	15.8%	729,677.1	13.9%	723,555.5	13.8%
	1,392,382,370	28,189,676	2.0%	32,250,404.7	2.3%	29,691,142.3	2.1%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-7

Probability of Death - Healthy Retirees

Females - School Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	153	-	0.0%	0.4	0.2%	0.4	0.2%
56	543	-	0.0%	1.5	0.3%	1.4	0.3%
57	922	2	0.2%	2.7	0.3%	2.6	0.3%
58	1,393	2	0.1%	4.4	0.3%	4.1	0.3%
59	1,839	5	0.3%	6.2	0.3%	5.8	0.3%
60	2,384	3	0.1%	8.7	0.4%	8.1	0.3%
61	3,039	5	0.2%	12.1	0.4%	11.0	0.4%
62	3,847	8	0.2%	16.6	0.4%	14.9	0.4%
63	4,970	13	0.3%	23.1	0.5%	20.7	0.4%
64	5,865	27	0.5%	29.5	0.5%	26.4	0.5%
65	6,815	32	0.5%	37.1	0.5%	33.1	0.5%
66	7,882	27	0.3%	46.4	0.6%	41.6	0.5%
67	8,622	47	0.5%	55.0	0.6%	49.5	0.6%
68	8,757	60	0.7%	60.7	0.7%	54.9	0.6%
69	8,681	58	0.7%	65.5	0.8%	59.9	0.7%
70	8,755	63	0.7%	72.2	0.8%	66.7	0.8%
71	8,397	83	1.0%	75.9	0.9%	71.1	0.8%
72	7,617	77	1.0%	75.7	1.0%	71.9	0.9%
73	6,924	81	1.2%	80.8	1.2%	75.3	1.1%
74	6,012	67	1.1%	82.5	1.4%	75.5	1.3%
75	5,490	89	1.6%	88.7	1.6%	79.8	1.5%
76	5,132	90	1.8%	97.7	1.9%	86.5	1.7%
77	4,781	103	2.2%	107.5	2.2%	93.5	2.0%
78	4,416	123	2.8%	117.3	2.7%	100.3	2.3%
79	4,157	96	2.3%	122.7	3.0%	106.8	2.6%
80	3,989	117	2.9%	131.0	3.3%	116.0	2.9%
81	3,868	120	3.1%	141.7	3.7%	127.4	3.3%
82	3,651	127	3.5%	149.4	4.1%	136.5	3.7%
83	3,318	171	5.2%	152.1	4.6%	140.9	4.2%
84	2,945	168	5.7%	151.4	5.1%	142.1	4.8%
85	2,604	152	5.8%	150.3	5.8%	142.9	5.5%
86	2,359	161	6.8%	153.1	6.5%	147.3	6.2%
87	2,244	183	8.2%	163.8	7.3%	159.5	7.1%
88	2,073	178	8.6%	170.2	8.2%	167.6	8.1%
89	1,869	184	9.8%	172.5	9.2%	171.5	9.2%
90	1,673	211	12.6%	173.3	10.4%	173.6	10.4%
	157,986	2,933	1.9%	2,999.8	1.9%	2,786.9	1.8%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-8

Probability of Death - Healthy Retirees

Females - School Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	2,560,994	-	0.0%	6,376.9	0.2%	6,172.5	0.2%
56	10,831,331	-	0.0%	29,017.1	0.3%	28,016.3	0.3%
57	21,156,371	31,120	0.1%	61,184.2	0.3%	58,626.4	0.3%
58	33,729,989	24,588	0.1%	105,515.8	0.3%	100,147.7	0.3%
59	44,017,632	113,957	0.3%	149,087.7	0.3%	139,329.0	0.3%
60	59,008,707	38,964	0.1%	216,502.9	0.4%	199,632.4	0.3%
61	73,812,641	131,475	0.2%	293,405.2	0.4%	266,921.3	0.4%
62	91,850,804	152,233	0.2%	395,211.0	0.4%	356,289.3	0.4%
63	113,796,108	284,374	0.2%	529,834.7	0.5%	474,393.2	0.4%
64	130,861,385	619,577	0.5%	658,952.5	0.5%	589,229.6	0.5%
65	147,771,503	644,258	0.4%	804,615.8	0.5%	718,435.5	0.5%
66	166,821,804	600,139	0.4%	982,789.0	0.6%	880,418.8	0.5%
67	180,205,849	765,412	0.4%	1,150,299.0	0.6%	1,034,742.0	0.6%
68	179,154,971	1,055,657	0.6%	1,241,947.0	0.7%	1,124,000.4	0.6%
69	172,368,585	1,016,621	0.6%	1,301,425.9	0.8%	1,188,464.2	0.7%
70	165,001,721	1,027,458	0.6%	1,361,387.9	0.8%	1,257,511.1	0.8%
71	148,312,680	1,478,988	1.0%	1,341,154.5	0.9%	1,254,992.2	0.8%
72	128,451,695	1,212,950	0.9%	1,276,585.1	1.0%	1,212,828.1	0.9%
73	109,157,773	1,063,449	1.0%	1,273,277.0	1.2%	1,186,661.2	1.1%
74	88,968,381	896,574	1.0%	1,220,277.8	1.4%	1,116,955.6	1.3%
75	76,607,138	1,263,978	1.6%	1,237,583.5	1.6%	1,113,462.4	1.5%
76	67,763,401	929,756	1.4%	1,290,405.9	1.9%	1,142,198.4	1.7%
77	61,530,888	1,176,322	1.9%	1,383,316.4	2.2%	1,203,227.3	2.0%
78	55,126,547	1,461,404	2.7%	1,464,558.0	2.7%	1,251,951.4	2.3%
79	50,024,265	1,000,799	2.0%	1,476,476.2	3.0%	1,285,184.4	2.6%
80	47,023,669	1,337,574	2.8%	1,544,487.7	3.3%	1,367,201.0	2.9%
81	43,886,374	1,322,782	3.0%	1,607,509.6	3.7%	1,445,920.9	3.3%
82	40,046,726	1,282,715	3.2%	1,639,064.4	4.1%	1,496,855.3	3.7%
83	34,940,128	1,798,826	5.1%	1,601,435.3	4.6%	1,483,276.2	4.2%
84	29,453,002	1,592,735	5.4%	1,513,810.7	5.1%	1,420,768.0	4.8%
85	25,225,079	1,448,504	5.7%	1,456,137.9	5.8%	1,384,149.5	5.5%
86	21,722,357	1,275,863	5.9%	1,409,733.2	6.5%	1,356,305.7	6.2%
87	19,851,921	1,554,499	7.8%	1,449,132.7	7.3%	1,410,893.5	7.1%
88	17,289,303	1,348,630	7.8%	1,419,463.9	8.2%	1,397,499.5	8.1%
89	14,716,217	1,544,898	10.5%	1,358,127.3	9.2%	1,350,484.3	9.2%
90	12,489,274	1,714,555	13.7%	1,294,083.6	10.4%	1,296,313.5	10.4%
	2,685,537,213	33,211,634	1.2%	37,544,173.5	1.4%	34,599,458.0	1.3%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-9

Probability of Death - Healthy Retirees

Males - Other Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	47	1	2.1%	0.3	0.6%	0.2	0.5%
56	175	-	0.0%	1.1	0.6%	0.9	0.5%
57	266	3	1.1%	1.7	0.6%	1.5	0.6%
58	402	1	0.2%	2.8	0.7%	2.5	0.6%
59	536	6	1.1%	3.9	0.7%	3.6	0.7%
60	675	5	0.7%	5.3	0.8%	4.9	0.7%
61	833	4	0.5%	7.1	0.8%	6.4	0.8%
62	1,080	11	1.0%	9.8	0.9%	9.0	0.8%
63	1,495	10	0.7%	14.6	1.0%	13.4	0.9%
64	1,780	17	1.0%	18.7	1.1%	17.2	1.0%
65	2,076	25	1.2%	23.5	1.1%	21.8	1.0%
66	2,556	22	0.9%	31.3	1.2%	29.2	1.1%
67	2,798	38	1.4%	37.1	1.3%	35.0	1.3%
68	2,839	30	1.1%	40.9	1.4%	39.1	1.4%
69	2,874	50	1.7%	45.1	1.6%	43.6	1.5%
70	2,960	49	1.7%	50.8	1.7%	49.7	1.7%
71	3,000	53	1.8%	56.4	1.9%	55.9	1.9%
72	2,795	60	2.1%	57.8	2.1%	58.1	2.1%
73	2,498	76	3.0%	58.7	2.3%	58.0	2.3%
74	2,208	78	3.5%	59.0	2.7%	57.5	2.6%
75	2,054	64	3.1%	62.6	3.0%	60.1	2.9%
76	1,919	70	3.6%	66.9	3.5%	63.2	3.3%
77	1,833	69	3.8%	73.2	4.0%	68.1	3.7%
78	1,721	77	4.5%	78.8	4.6%	72.2	4.2%
79	1,601	74	4.6%	81.7	5.1%	75.9	4.7%
80	1,518	86	5.7%	86.4	5.7%	81.4	5.4%
81	1,463	102	7.0%	93.0	6.4%	88.6	6.1%
82	1,355	95	7.0%	96.4	7.1%	92.7	6.8%
83	1,228	92	7.5%	97.9	8.0%	94.7	7.7%
84	1,112	85	7.6%	99.3	8.9%	96.4	8.7%
85	962	89	9.3%	96.2	10.0%	93.5	9.7%
86	859	88	10.2%	96.3	11.2%	93.2	10.9%
87	756	91	12.0%	94.8	12.5%	91.4	12.1%
88	633	83	13.1%	88.8	14.0%	84.9	13.4%
89	532	89	16.7%	83.4	15.7%	78.8	14.8%
90	426	86	20.2%	74.1	17.4%	69.3	16.3%
	53,865	1,879	3.5%	1,895.6	3.5%	1,811.8	3.4%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-10

Probability of Death - Healthy Retirees

Males - Other Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	793,587	11,016	1.4%	4,471.8	0.6%	3,812.7	0.5%
56	3,449,163	-	0.0%	20,745.7	0.6%	18,056.7	0.5%
57	5,497,147	39,959	0.7%	35,319.7	0.6%	31,342.9	0.6%
58	9,226,008	45,624	0.5%	63,413.1	0.7%	57,015.5	0.6%
59	12,992,354	113,177	0.9%	95,673.1	0.7%	86,731.0	0.7%
60	17,422,035	119,239	0.7%	137,559.2	0.8%	125,410.3	0.7%
61	21,166,489	109,182	0.5%	179,354.2	0.8%	163,656.5	0.8%
62	26,783,023	272,719	1.0%	243,795.1	0.9%	222,566.7	0.8%
63	36,433,006	264,837	0.7%	356,489.7	1.0%	326,117.7	0.9%
64	42,611,340	403,617	0.9%	448,620.7	1.1%	412,172.7	1.0%
65	47,927,861	478,254	1.0%	543,588.2	1.1%	503,161.5	1.0%
66	57,383,735	547,445	1.0%	702,531.9	1.2%	656,368.9	1.1%
67	60,614,767	626,177	1.0%	803,351.8	1.3%	759,001.7	1.3%
68	60,787,047	680,470	1.1%	875,114.6	1.4%	836,337.4	1.4%
69	60,135,363	1,054,613	1.8%	943,397.6	1.6%	911,893.2	1.5%
70	59,158,202	755,387	1.3%	1,014,533.6	1.7%	992,905.9	1.7%
71	57,681,506	1,065,729	1.8%	1,084,625.7	1.9%	1,074,931.8	1.9%
72	50,496,054	836,120	1.7%	1,043,950.4	2.1%	1,049,078.8	2.1%
73	43,228,547	1,329,492	3.1%	1,015,405.3	2.3%	1,003,970.5	2.3%
74	37,313,415	1,261,966	3.4%	997,538.5	2.7%	971,519.7	2.6%
75	33,082,524	970,178	2.9%	1,008,848.0	3.0%	967,900.0	2.9%
76	29,586,076	1,080,086	3.7%	1,031,242.6	3.5%	974,486.1	3.3%
77	27,115,453	865,077	3.2%	1,082,210.5	4.0%	1,006,971.7	3.7%
78	23,973,515	1,082,379	4.5%	1,097,303.3	4.6%	1,005,237.3	4.2%
79	21,034,118	825,082	3.9%	1,072,916.7	5.1%	996,956.4	4.7%
80	19,220,785	967,071	5.0%	1,094,260.8	5.7%	1,030,612.0	5.4%
81	17,583,908	1,031,027	5.9%	1,118,186.7	6.4%	1,065,478.6	6.1%
82	15,215,048	987,555	6.5%	1,082,441.7	7.1%	1,041,027.1	6.8%
83	12,972,632	865,705	6.7%	1,033,970.7	8.0%	1,000,623.6	7.7%
84	11,136,136	953,508	8.6%	994,202.2	8.9%	965,530.6	8.7%
85	8,953,578	820,192	9.2%	895,535.8	10.0%	869,886.7	9.7%
86	7,489,193	828,365	11.1%	839,342.0	11.2%	812,848.6	10.9%
87	6,594,112	706,359	10.7%	827,228.4	12.5%	797,003.1	12.1%
88	5,262,788	697,604	13.3%	738,361.2	14.0%	705,594.8	13.4%
89	4,322,489	667,028	15.4%	677,434.0	15.7%	639,982.8	14.8%
90	3,287,100	609,542	18.5%	571,766.9	17.4%	534,629.6	16.3%
	957,930,104	23,971,781	2.5%	25,774,731.2	2.7%	24,620,820.9	2.6%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-11

Probability of Death - Healthy Retirees

Females - Other Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	86	-	0.0%	0.3	0.3%	0.3	0.3%
56	331	1	0.3%	1.1	0.3%	1.1	0.3%
57	514	1	0.2%	1.9	0.4%	1.8	0.3%
58	712	2	0.3%	2.9	0.4%	2.6	0.4%
59	929	3	0.3%	4.1	0.4%	3.6	0.4%
60	1,201	4	0.3%	5.7	0.5%	5.0	0.4%
61	1,462	7	0.5%	7.5	0.5%	6.6	0.4%
62	1,881	15	0.8%	10.5	0.6%	9.1	0.5%
63	2,460	15	0.6%	14.9	0.6%	12.8	0.5%
64	2,731	15	0.5%	17.8	0.7%	15.3	0.6%
65	3,298	17	0.5%	23.3	0.7%	20.1	0.6%
66	3,931	29	0.7%	30.1	0.8%	26.1	0.7%
67	4,125	26	0.6%	34.3	0.8%	29.9	0.7%
68	4,184	41	1.0%	37.9	0.9%	33.3	0.8%
69	4,124	19	0.5%	40.8	1.0%	36.3	0.9%
70	4,206	49	1.2%	45.6	1.1%	41.1	1.0%
71	4,252	61	1.4%	50.7	1.2%	46.4	1.1%
72	3,985	50	1.3%	52.3	1.3%	48.7	1.2%
73	3,676	48	1.3%	54.6	1.5%	50.5	1.4%
74	3,322	59	1.8%	56.0	1.7%	51.4	1.5%
75	3,102	54	1.7%	59.3	1.9%	54.2	1.7%
76	3,000	67	2.2%	65.2	2.2%	59.1	2.0%
77	2,865	64	2.2%	70.8	2.5%	63.8	2.2%
78	2,704	59	2.2%	76.2	2.8%	68.2	2.5%
79	2,555	77	3.0%	80.1	3.1%	72.9	2.9%
80	2,359	86	3.6%	82.5	3.5%	76.3	3.2%
81	2,179	88	4.0%	85.1	3.9%	79.9	3.7%
82	2,049	97	4.7%	89.6	4.4%	85.3	4.2%
83	1,908	93	4.9%	93.6	4.9%	90.3	4.7%
84	1,832	113	6.2%	100.9	5.5%	98.6	5.4%
85	1,648	98	5.9%	102.1	6.2%	101.0	6.1%
86	1,509	115	7.6%	105.1	7.0%	105.2	7.0%
87	1,353	116	8.6%	106.0	7.8%	107.3	7.9%
88	1,211	91	7.5%	106.7	8.8%	109.0	9.0%
89	1,057	108	10.2%	104.5	9.9%	107.6	10.2%
90	879	100	11.4%	97.4	11.1%	100.7	11.5%
	83,620	1,888	2.3%	1,917.9	2.3%	1,821.5	2.2%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-12

Probability of Death - Healthy Retirees

Females - Other Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	1,085,208	-	0.0%	3,488.7	0.3%	3,243.6	0.3%
56	4,978,256	18,688	0.4%	17,276.5	0.3%	15,941.2	0.3%
57	8,671,209	29,369	0.3%	32,550.9	0.4%	29,750.6	0.3%
58	12,603,344	31,262	0.2%	51,225.0	0.4%	46,099.0	0.4%
59	16,408,084	47,975	0.3%	72,241.5	0.4%	64,145.1	0.4%
60	22,106,032	42,898	0.2%	105,445.8	0.5%	92,374.9	0.4%
61	27,120,496	145,281	0.5%	140,031.3	0.5%	121,564.9	0.4%
62	34,195,087	263,736	0.8%	191,054.8	0.6%	164,727.3	0.5%
63	43,753,876	213,360	0.5%	264,387.2	0.6%	227,656.7	0.5%
64	47,490,653	225,427	0.5%	310,303.9	0.7%	266,806.3	0.6%
65	54,802,650	245,764	0.4%	387,427.3	0.7%	334,217.2	0.6%
66	63,407,088	512,162	0.8%	485,692.0	0.8%	420,718.7	0.7%
67	65,536,586	386,717	0.6%	545,179.2	0.8%	475,129.8	0.7%
68	64,606,557	546,304	0.8%	585,354.8	0.9%	514,748.9	0.8%
69	61,072,388	295,478	0.5%	604,671.6	1.0%	537,847.4	0.9%
70	59,186,393	691,258	1.2%	642,249.3	1.1%	578,729.3	1.0%
71	57,067,405	734,978	1.3%	680,580.2	1.2%	622,641.9	1.1%
72	51,121,162	666,625	1.3%	671,318.0	1.3%	624,913.3	1.2%
73	44,958,956	451,106	1.0%	668,243.1	1.5%	617,617.4	1.4%
74	38,479,692	600,588	1.6%	648,437.3	1.7%	595,520.9	1.5%
75	33,621,410	405,133	1.2%	642,856.6	1.9%	587,188.5	1.7%
76	31,065,357	635,026	2.0%	675,006.0	2.2%	612,494.5	2.0%
77	28,381,448	556,290	2.0%	701,486.2	2.5%	632,395.4	2.2%
78	25,524,333	610,705	2.4%	719,112.3	2.8%	643,378.6	2.5%
79	23,080,889	694,752	3.0%	723,630.9	3.1%	658,409.1	2.9%
80	20,402,059	670,581	3.3%	713,336.6	3.5%	659,502.3	3.2%
81	17,954,022	695,390	3.9%	701,434.9	3.9%	658,418.5	3.7%
82	15,911,894	728,849	4.6%	696,150.9	4.4%	662,745.7	4.2%
83	13,978,888	665,266	4.8%	685,821.7	4.9%	661,597.3	4.7%
84	12,640,589	737,778	5.8%	696,520.5	5.5%	680,526.8	5.4%
85	10,631,172	514,316	4.8%	658,578.8	6.2%	651,267.3	6.1%
86	9,105,232	789,225	8.7%	634,443.9	7.0%	634,907.1	7.0%
87	7,732,849	689,202	8.9%	606,014.5	7.8%	613,255.1	7.9%
88	6,549,560	489,602	7.5%	576,969.7	8.8%	589,702.5	9.0%
89	5,573,550	555,073	10.0%	551,256.4	9.9%	567,586.7	10.2%
90	4,584,141	520,668	11.4%	507,943.0	11.1%	525,274.3	11.5%
	1,045,388,515	16,106,832	1.5%	17,597,721.3	1.7%	16,393,044.2	1.6%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-13

Probability of Death - Healthy Retirees

Males - Special Services Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	150	-	0.0%	0.9	0.6%	0.6	0.4%
56	294	4	1.4%	2.0	0.7%	1.4	0.5%
57	355	-	0.0%	2.5	0.7%	1.9	0.5%
58	394	3	0.8%	3.0	0.8%	2.3	0.6%
59	432	3	0.7%	3.5	0.8%	2.8	0.7%
60	446	2	0.4%	3.9	0.9%	3.3	0.7%
61	481	3	0.6%	4.5	0.9%	3.9	0.8%
62	506	2	0.4%	5.1	1.0%	4.5	0.9%
63	572	7	1.2%	6.2	1.1%	5.6	1.0%
64	576	11	1.9%	6.7	1.2%	6.2	1.1%
65	581	6	1.0%	7.3	1.3%	6.9	1.2%
66	633	9	1.4%	8.6	1.4%	8.3	1.3%
67	642	11	1.7%	9.5	1.5%	9.4	1.5%
68	630	9	1.4%	10.1	1.6%	10.2	1.6%
69	616	11	1.8%	10.7	1.7%	11.1	1.8%
70	576	9	1.6%	11.0	1.9%	11.6	2.0%
71	531	17	3.2%	11.1	2.1%	12.0	2.3%
72	446	17	3.8%	10.2	2.3%	11.3	2.5%
73	362	5	1.4%	9.3	2.6%	10.3	2.9%
74	304	9	3.0%	8.8	2.9%	9.8	3.2%
75	260	10	3.8%	8.4	3.2%	9.4	3.6%
76	229	5	2.2%	8.4	3.7%	9.4	4.1%
77	209	10	4.8%	8.6	4.1%	9.7	4.6%
78	181	8	4.4%	8.4	4.7%	9.5	5.2%
79	160	12	7.5%	8.3	5.2%	9.4	5.9%
80	145	13	9.0%	8.4	5.8%	9.7	6.7%
81	121	5	4.1%	7.8	6.5%	9.1	7.5%
82	110	7	6.4%	8.0	7.2%	9.3	8.5%
83	95	8	8.4%	7.7	8.1%	9.0	9.5%
84	76	8	10.5%	6.9	9.1%	8.1	10.7%
85	61	11	18.0%	6.2	10.2%	7.3	12.0%
86	44	10	22.7%	5.0	11.4%	5.9	13.4%
87	32	6	18.8%	4.1	12.8%	4.8	14.9%
88	27	3	11.1%	3.9	14.3%	4.5	16.5%
89	29	6	20.7%	4.6	16.0%	5.3	18.1%
90	23	1	4.3%	4.1	17.7%	4.5	19.6%
	11,329	261	2.3%	244.0	2.2%	258.1	2.3%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-14

Probability of Death - Healthy Retirees

Males - Special Services Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	5,482,390	-	0.0%	34,325.2	0.6%	22,872.5	0.4%
56	9,789,937	130,838	1.3%	65,426.1	0.7%	45,895.2	0.5%
57	12,022,838	-	0.0%	85,831.0	0.7%	63,264.2	0.5%
58	13,747,077	78,178	0.6%	104,986.4	0.8%	81,011.5	0.6%
59	15,079,762	94,376	0.6%	123,382.6	0.8%	99,028.8	0.7%
60	15,548,305	27,292	0.2%	136,405.3	0.9%	113,316.0	0.7%
61	17,002,119	117,097	0.7%	160,075.0	0.9%	137,122.1	0.8%
62	17,212,236	63,301	0.4%	174,084.6	1.0%	153,275.0	0.9%
63	19,017,462	231,563	1.2%	206,757.8	1.1%	186,618.4	1.0%
64	18,466,416	392,462	2.1%	216,020.1	1.2%	199,695.8	1.1%
65	18,003,935	160,108	0.9%	226,885.6	1.3%	214,552.9	1.2%
66	19,568,595	270,969	1.4%	266,191.6	1.4%	257,581.4	1.3%
67	19,160,215	304,512	1.6%	282,153.3	1.5%	279,241.0	1.5%
68	18,377,974	261,925	1.4%	293,974.1	1.6%	297,594.5	1.6%
69	16,999,039	329,782	1.9%	296,310.2	1.7%	306,492.7	1.8%
70	15,066,683	197,550	1.3%	287,095.6	1.9%	303,458.1	2.0%
71	13,091,176	348,815	2.7%	273,513.9	2.1%	295,441.7	2.3%
72	10,667,338	313,366	2.9%	245,039.4	2.3%	270,225.0	2.5%
73	8,473,109	132,332	1.6%	217,957.1	2.6%	241,483.6	2.9%
74	6,780,056	205,460	3.0%	195,640.7	2.9%	217,700.8	3.2%
75	5,518,926	255,342	4.6%	179,037.9	3.2%	199,906.5	3.6%
76	4,817,368	102,212	2.1%	176,055.0	3.7%	197,035.2	4.1%
77	4,296,989	290,690	6.8%	177,225.5	4.1%	198,555.3	4.6%
78	3,453,548	146,928	4.3%	161,001.3	4.7%	180,337.4	5.2%
79	2,995,647	208,087	6.9%	155,632.8	5.2%	176,758.2	5.9%
80	2,638,814	220,146	8.3%	153,012.7	5.8%	175,684.3	6.7%
81	1,984,282	67,192	3.4%	128,520.2	6.5%	148,979.9	7.5%
82	1,735,708	120,699	7.0%	125,769.9	7.2%	146,762.8	8.5%
83	1,390,254	90,481	6.5%	112,860.8	8.1%	132,175.6	9.5%
84	1,055,385	136,874	13.0%	95,966.6	9.1%	112,610.6	10.7%
85	797,621	145,194	18.2%	81,255.3	10.2%	95,373.9	12.0%
86	581,708	125,012	21.5%	66,401.5	11.4%	77,829.0	13.4%
87	410,503	79,645	19.4%	52,451.1	12.8%	61,333.7	14.9%
88	321,397	44,858	14.0%	45,926.5	14.3%	53,156.2	16.5%
89	347,767	55,592	16.0%	55,512.4	16.0%	62,958.3	18.1%
90	292,572	10,047	3.4%	51,833.2	17.7%	57,381.6	19.6%
	322,195,151	5,758,925	1.8%	5,710,518.6	1.8%	5,862,709.6	1.8%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-15

Probability of Death - Disabled Retirees

Males - Regular Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	82	1	1.2%	2.2	2.7%	2.3	2.8%
56	109	3	2.8%	3.1	2.8%	3.1	2.9%
57	114	4	3.5%	3.3	2.9%	3.4	3.0%
58	143	2	1.4%	4.4	3.1%	4.4	3.1%
59	167	9	5.4%	5.3	3.2%	5.3	3.2%
60	205	9	4.4%	6.8	3.3%	6.7	3.3%
61	236	10	4.2%	8.2	3.5%	8.0	3.4%
62	262	12	4.6%	9.5	3.6%	9.2	3.5%
63	276	12	4.3%	10.5	3.8%	10.0	3.6%
64	287	10	3.5%	11.5	4.0%	10.9	3.8%
65	297	19	6.4%	12.4	4.2%	11.8	4.0%
66	284	6	2.1%	12.5	4.4%	11.9	4.2%
67	281	15	5.3%	13.0	4.6%	12.4	4.4%
68	245	13	5.3%	12.0	4.9%	11.5	4.7%
69	229	8	3.5%	11.9	5.2%	11.5	5.0%
70	234	14	6.0%	12.9	5.5%	12.5	5.4%
71	216	10	4.6%	12.7	5.9%	12.4	5.8%
72	208	14	6.7%	13.1	6.3%	12.9	6.2%
73	187	12	6.4%	12.6	6.7%	12.5	6.7%
74	162	14	8.6%	11.7	7.2%	11.8	7.3%
75	145	10	6.9%	11.3	7.8%	11.4	7.9%
76	133	10	7.5%	11.2	8.4%	11.4	8.6%
77	120	8	6.7%	10.9	9.1%	11.1	9.3%
78	104	10	9.6%	10.3	9.9%	10.5	10.1%
79	100	9	9.0%	10.7	10.7%	10.9	10.9%
80	78	13	16.7%	9.1	11.7%	9.2	11.8%
81	76	12	15.8%	9.7	12.7%	9.7	12.8%
82	72	7	9.7%	10.0	13.9%	10.1	14.0%
83	63	7	11.1%	9.5	15.1%	9.7	15.4%
84	60	12	20.0%	9.9	16.5%	10.1	16.8%
85	48	7	14.6%	8.6	17.9%	8.7	18.1%
86	39	5	12.8%	7.5	19.3%	7.6	19.5%
87	29	5	17.2%	6.0	20.8%	6.1	20.9%
88	24	7	29.2%	5.3	22.2%	5.4	22.3%
89	14	4	28.6%	3.3	23.7%	3.3	23.9%
90	9	5	55.6%	2.3	25.1%	2.3	25.6%
	5,338	328	6.1%	325.4	6.1%	322.1	6.0%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-16

Probability of Death - Disabled Retirees

Males - Regular Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	1,057,173	5,416	0.5%	28,482.4	2.7%	29,484.6	2.8%
56	1,488,550	30,844	2.1%	41,750.9	2.8%	42,923.8	2.9%
57	1,453,907	50,616	3.5%	42,506.4	2.9%	43,316.3	3.0%
58	2,193,065	19,450	0.9%	66,892.9	3.1%	67,443.3	3.1%
59	2,576,160	215,321	8.4%	82,055.8	3.2%	81,749.3	3.2%
60	3,006,761	169,886	5.7%	100,083.0	3.3%	98,483.4	3.3%
61	3,582,045	117,756	3.3%	124,637.3	3.5%	121,212.8	3.4%
62	3,684,301	196,441	5.3%	134,119.6	3.6%	129,072.1	3.5%
63	3,870,755	193,573	5.0%	147,506.7	3.8%	140,760.0	3.6%
64	3,991,767	143,132	3.6%	159,415.2	4.0%	151,331.9	3.8%
65	3,820,784	320,373	8.4%	160,144.3	4.2%	151,635.5	4.0%
66	3,752,685	77,476	2.1%	165,347.1	4.4%	156,727.1	4.2%
67	3,465,782	190,155	5.5%	160,919.7	4.6%	153,045.5	4.4%
68	2,987,819	207,591	6.9%	146,519.7	4.9%	140,164.6	4.7%
69	2,829,074	99,422	3.5%	146,947.8	5.2%	141,578.2	5.0%
70	2,831,579	149,138	5.3%	156,232.4	5.5%	151,761.3	5.4%
71	2,592,841	110,705	4.3%	152,409.8	5.9%	149,324.3	5.8%
72	2,474,633	166,849	6.7%	155,458.9	6.3%	153,632.6	6.2%
73	2,151,221	113,586	5.3%	144,828.8	6.7%	144,331.9	6.7%
74	1,796,588	167,091	9.3%	129,999.3	7.2%	130,554.5	7.3%
75	1,608,179	83,561	5.2%	125,359.2	7.8%	126,761.5	7.9%
76	1,449,083	93,144	6.4%	121,988.2	8.4%	123,937.2	8.6%
77	1,326,288	99,426	7.5%	120,854.0	9.1%	123,129.9	9.3%
78	1,108,958	96,146	8.7%	109,578.4	9.9%	111,705.3	10.1%
79	1,068,379	80,256	7.5%	114,659.5	10.7%	116,651.0	10.9%
80	765,377	122,821	16.0%	89,346.3	11.7%	90,510.4	11.8%
81	684,811	109,183	15.9%	87,059.3	12.7%	87,676.4	12.8%
82	679,400	48,850	7.2%	94,148.5	13.9%	95,305.6	14.0%
83	533,374	42,761	8.0%	80,646.7	15.1%	82,011.1	15.4%
84	529,582	78,480	14.8%	87,406.4	16.5%	88,743.1	16.8%
85	435,264	80,589	18.5%	77,961.0	17.9%	78,962.5	18.1%
86	298,606	33,437	11.2%	57,712.2	19.3%	58,318.1	19.5%
87	199,086	42,892	21.5%	41,333.2	20.8%	41,666.5	20.9%
88	165,214	55,577	33.6%	36,683.3	22.2%	36,917.2	22.3%
89	83,274	17,876	21.5%	19,707.5	23.7%	19,919.5	23.9%
90	53,329	29,253	54.9%	13,403.8	25.1%	13,642.6	25.6%
	66,595,694	3,859,073	5.8%	3,724,105.3	5.6%	3,674,390.7	5.5%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-17

Probability of Death - Disabled Retirees

Females - Regular Membership

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	170	3	1.8%	3.0	1.8%	3.5	2.0%
56	222	4	1.8%	4.1	1.9%	4.6	2.1%
57	276	9	3.3%	5.4	1.9%	5.8	2.1%
58	318	8	2.5%	6.4	2.0%	6.7	2.1%
59	355	13	3.7%	7.5	2.1%	7.6	2.1%
60	378	9	2.4%	8.3	2.2%	8.2	2.2%
61	393	9	2.3%	9.1	2.3%	8.6	2.2%
62	421	11	2.6%	10.2	2.4%	9.5	2.3%
63	459	11	2.4%	11.8	2.6%	10.7	2.3%
64	501	13	2.6%	13.6	2.7%	12.2	2.4%
65	512	12	2.3%	14.8	2.9%	13.1	2.6%
66	496	15	3.0%	15.4	3.1%	13.4	2.7%
67	468	11	2.4%	15.6	3.3%	13.5	2.9%
68	438	14	3.2%	15.7	3.6%	13.5	3.1%
69	409	14	3.4%	15.8	3.9%	13.6	3.3%
70	377	12	3.2%	15.8	4.2%	13.6	3.6%
71	352	15	4.3%	15.9	4.5%	13.8	3.9%
72	324	17	5.2%	15.9	4.9%	13.9	4.3%
73	283	13	4.6%	15.1	5.3%	13.2	4.7%
74	258	10	3.9%	14.9	5.8%	13.2	5.1%
75	246	9	3.7%	15.4	6.3%	13.8	5.6%
76	216	13	6.0%	14.7	6.8%	13.3	6.1%
77	192	9	4.7%	14.2	7.4%	12.9	6.7%
78	175	18	10.3%	14.0	8.0%	13.0	7.4%
79	131	8	6.1%	11.4	8.7%	10.6	8.1%
80	119	5	4.2%	11.2	9.4%	10.6	8.9%
81	122	12	9.8%	12.4	10.2%	11.9	9.7%
82	113	5	4.4%	12.4	11.0%	11.9	10.6%
83	103	12	11.7%	12.2	11.9%	11.8	11.4%
84	93	11	11.8%	11.9	12.8%	11.4	12.3%
85	82	12	14.6%	11.4	13.9%	10.8	13.1%
86	68	9	13.2%	10.2	15.0%	9.6	14.1%
87	61	8	13.1%	9.9	16.3%	9.2	15.0%
88	41	5	12.2%	7.2	17.6%	6.6	16.1%
89	25	5	20.0%	4.7	19.0%	4.3	17.2%
90	18	2	11.1%	3.7	20.4%	3.3	18.5%
	9,215	366	4.0%	411.4	4.5%	377.0	4.1%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary E-18

Probability of Death - Disabled Retirees

Females - Regular Membership (Weighted)

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	1,672,646	26,301	1.6%	29,957.1	1.8%	34,285.9	2.0%
56	2,424,031	50,733	2.1%	45,167.0	1.9%	50,250.2	2.1%
57	3,136,412	112,985	3.6%	60,821.3	1.9%	65,613.7	2.1%
58	3,415,792	98,811	2.9%	68,978.5	2.0%	72,086.9	2.1%
59	3,775,274	162,877	4.3%	79,511.0	2.1%	80,451.1	2.1%
60	4,007,817	137,993	3.4%	88,236.1	2.2%	86,540.8	2.2%
61	4,238,929	185,041	4.4%	97,809.0	2.3%	93,197.1	2.2%
62	4,397,148	140,791	3.2%	106,732.0	2.4%	99,146.9	2.3%
63	4,937,520	103,062	2.1%	126,607.9	2.6%	115,034.3	2.3%
64	5,129,597	181,488	3.5%	139,509.6	2.7%	124,546.6	2.4%
65	5,248,113	92,615	1.8%	152,032.6	2.9%	133,926.6	2.6%
66	4,972,439	138,164	2.8%	154,056.1	3.1%	134,360.3	2.7%
67	4,503,892	105,563	2.3%	149,745.4	3.3%	129,761.6	2.9%
68	4,254,721	148,587	3.5%	152,340.3	3.6%	131,470.9	3.1%
69	3,571,231	78,197	2.2%	137,988.8	3.9%	118,993.4	3.3%
70	3,304,009	74,286	2.2%	138,097.7	4.2%	119,261.5	3.6%
71	3,162,452	119,649	3.8%	143,161.0	4.5%	124,072.5	3.9%
72	2,815,410	142,587	5.1%	138,214.1	4.9%	120,392.6	4.3%
73	2,543,837	140,780	5.5%	135,500.0	5.3%	118,871.0	4.7%
74	2,223,460	87,167	3.9%	128,558.2	5.8%	113,703.3	5.1%
75	2,027,887	64,355	3.2%	127,288.4	6.3%	113,642.8	5.6%
76	1,760,986	74,811	4.2%	119,935.5	6.8%	108,235.5	6.1%
77	1,477,569	99,165	6.7%	109,174.6	7.4%	99,645.8	6.7%
78	1,313,783	117,812	9.0%	105,247.2	8.0%	97,229.1	7.4%
79	899,288	44,240	4.9%	78,075.3	8.7%	73,009.6	8.1%
80	821,826	47,702	5.8%	77,276.3	9.4%	73,177.0	8.9%
81	812,068	87,867	10.8%	82,617.4	10.2%	78,953.3	9.7%
82	710,859	31,974	4.5%	78,211.6	11.0%	75,058.2	10.6%
83	672,872	61,694	9.2%	80,013.2	11.9%	76,766.6	11.4%
84	629,514	76,841	12.2%	80,869.3	12.8%	77,220.0	12.3%
85	550,924	76,028	13.8%	76,572.4	13.9%	72,419.0	13.1%
86	462,132	45,065	9.8%	69,535.6	15.0%	64,992.4	14.1%
87	390,356	35,986	9.2%	63,550.3	16.3%	58,697.8	15.0%
88	246,872	15,558	6.3%	43,438.6	17.6%	39,714.1	16.1%
89	163,314	43,568	26.7%	31,001.6	19.0%	28,131.0	17.2%
90	108,321	5,855	5.4%	22,143.6	20.4%	20,013.9	18.5%
	86,783,301	3,256,198	3.8%	3,517,974.6	4.1%	3,222,873.2	3.7%

APPENDIX F

RETIREMENT

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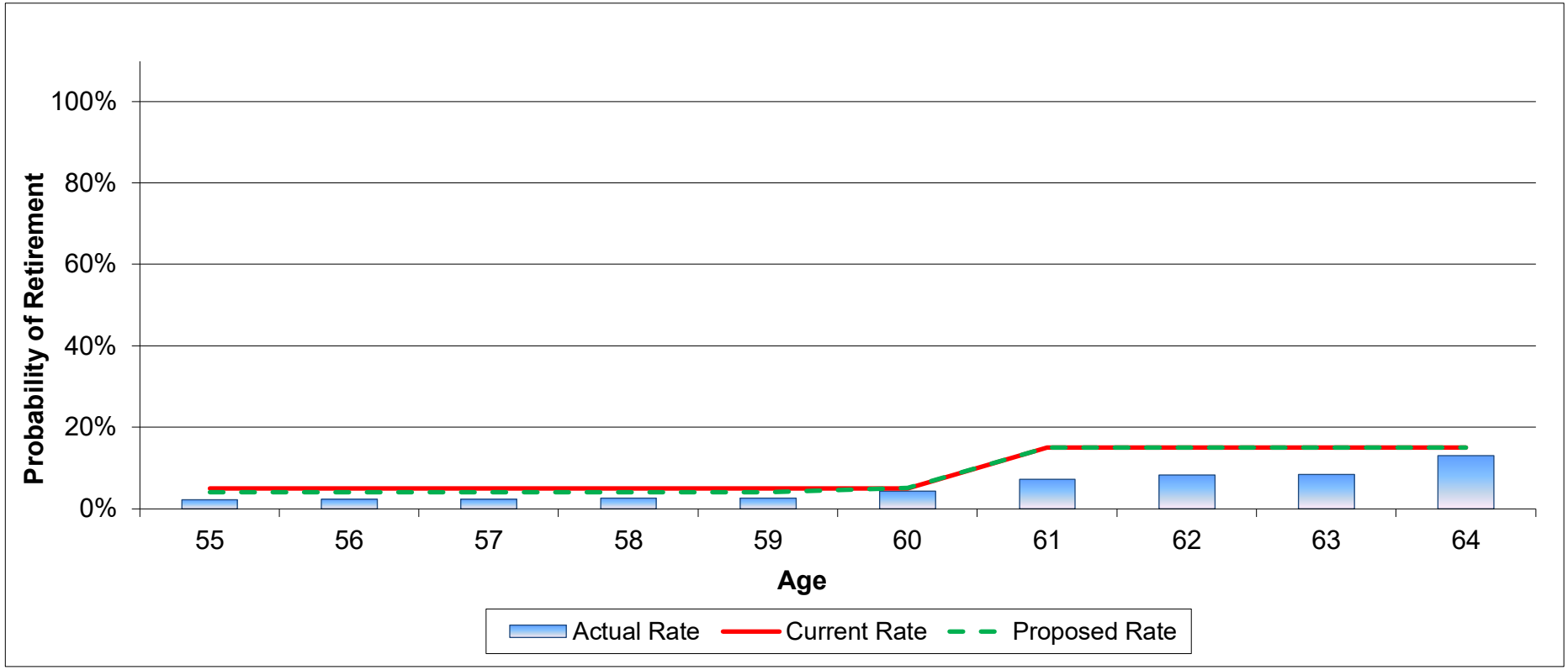
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-1

Retirement Rates - Early

State Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	533	956	872
Actual/Expected		56%	61%

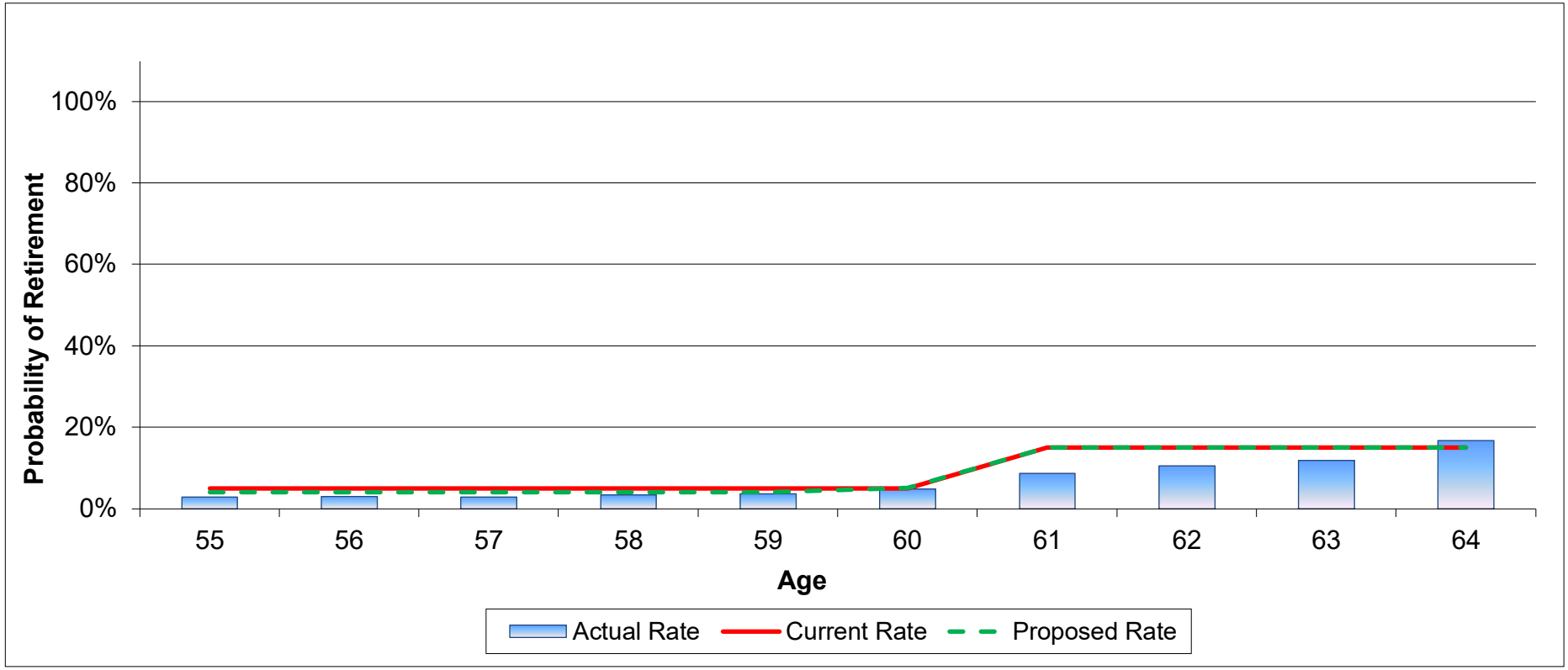
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-2

Retirement Rates - Early

State Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	6,553	9,585	8,584
Actual/Expected		68%	76%

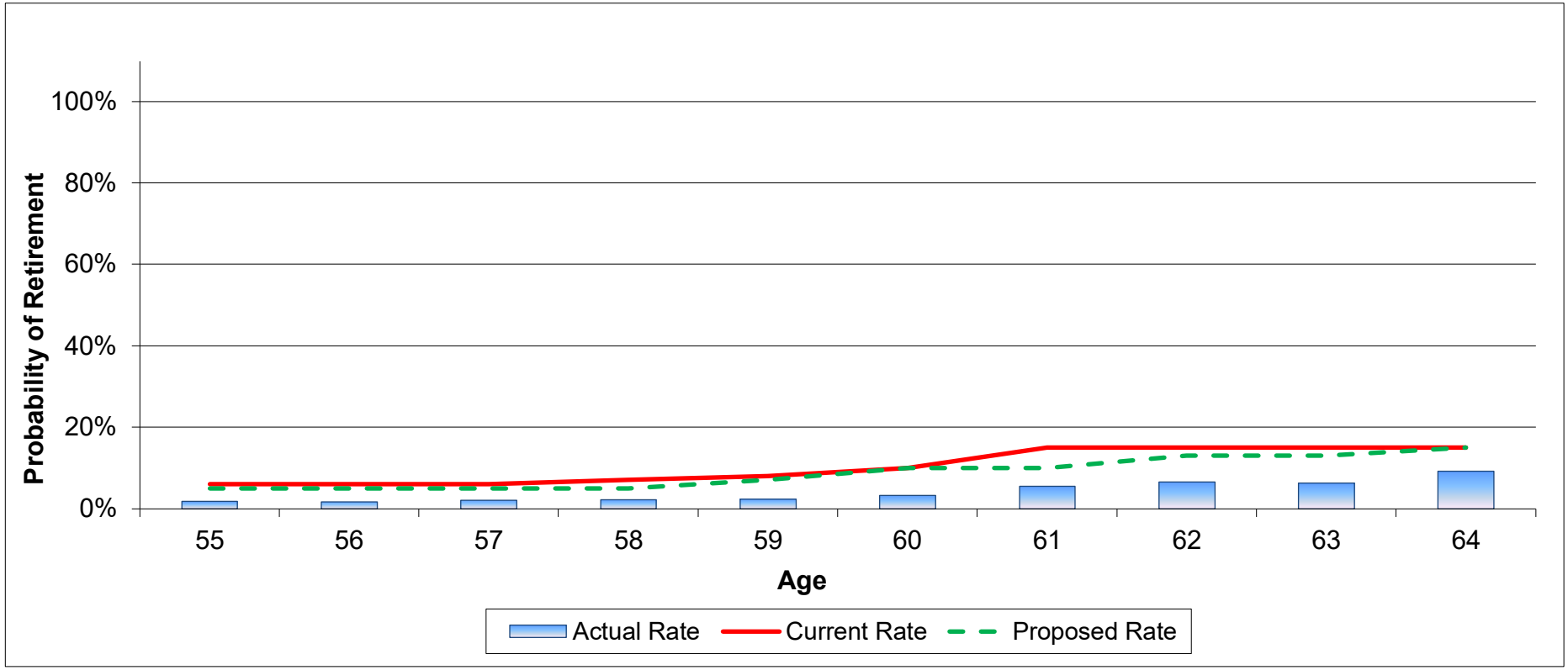
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-3

Retirement Rates - Early

School Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,906	5,244	4,396
Actual/Expected		36%	43%

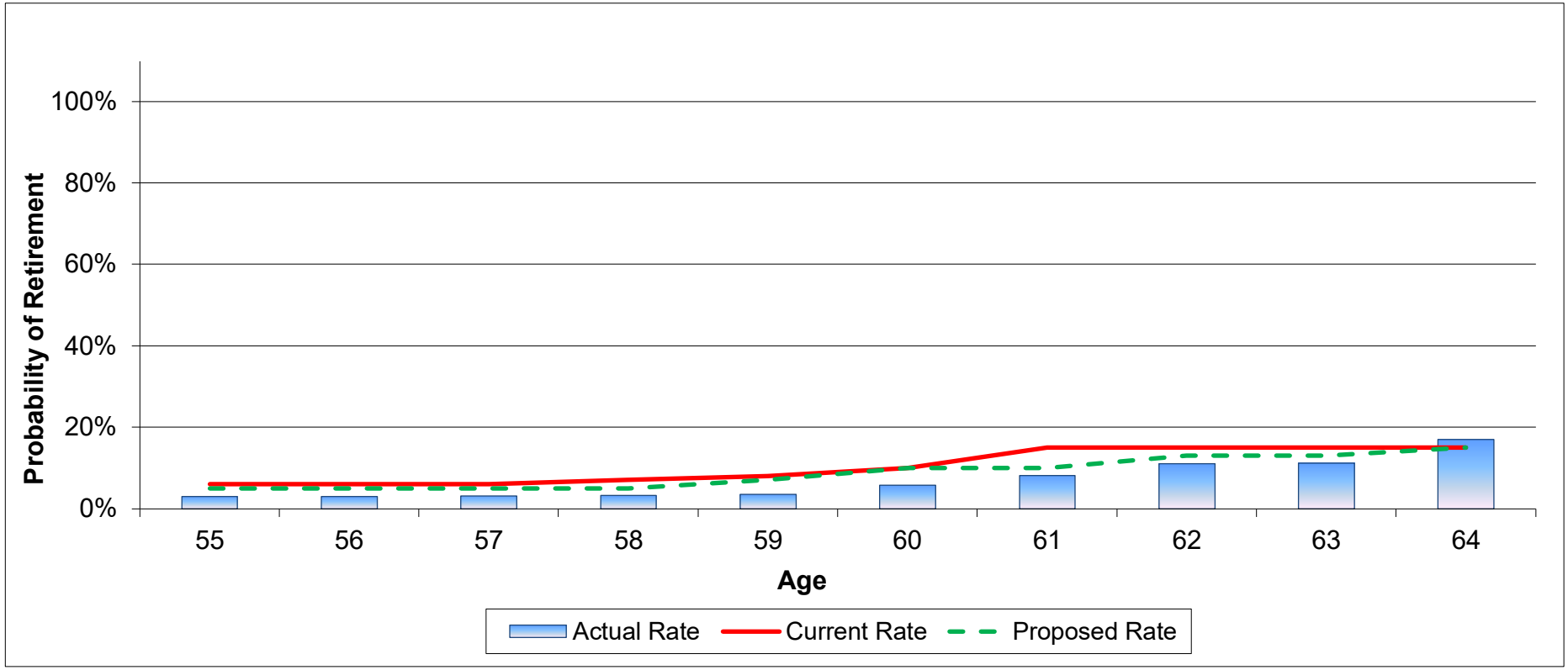
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-4

Retirement Rates - Early

School Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	16,479	29,802	24,707
Actual/Expected		55%	67%

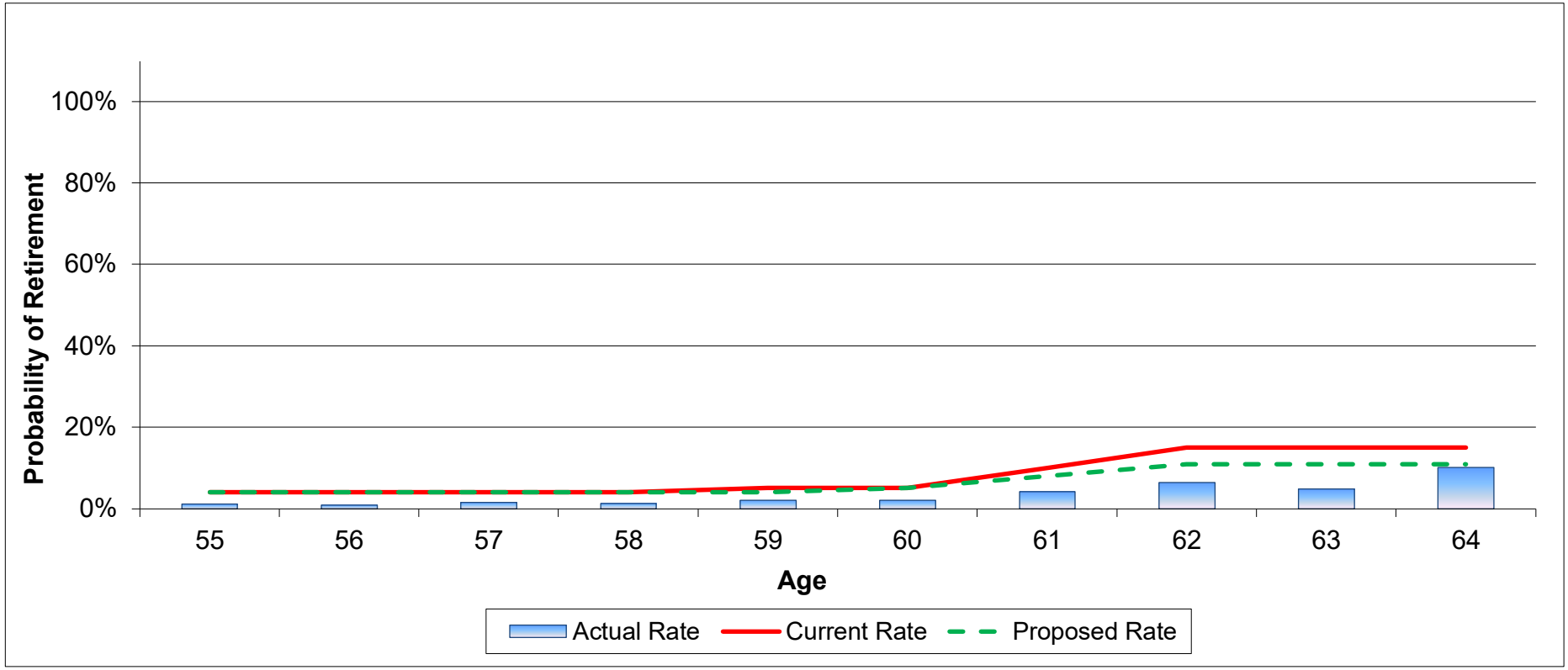
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-5

Retirement Rates - Early

Other Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,240	3,070	2,603
Actual/Expected		40%	48%

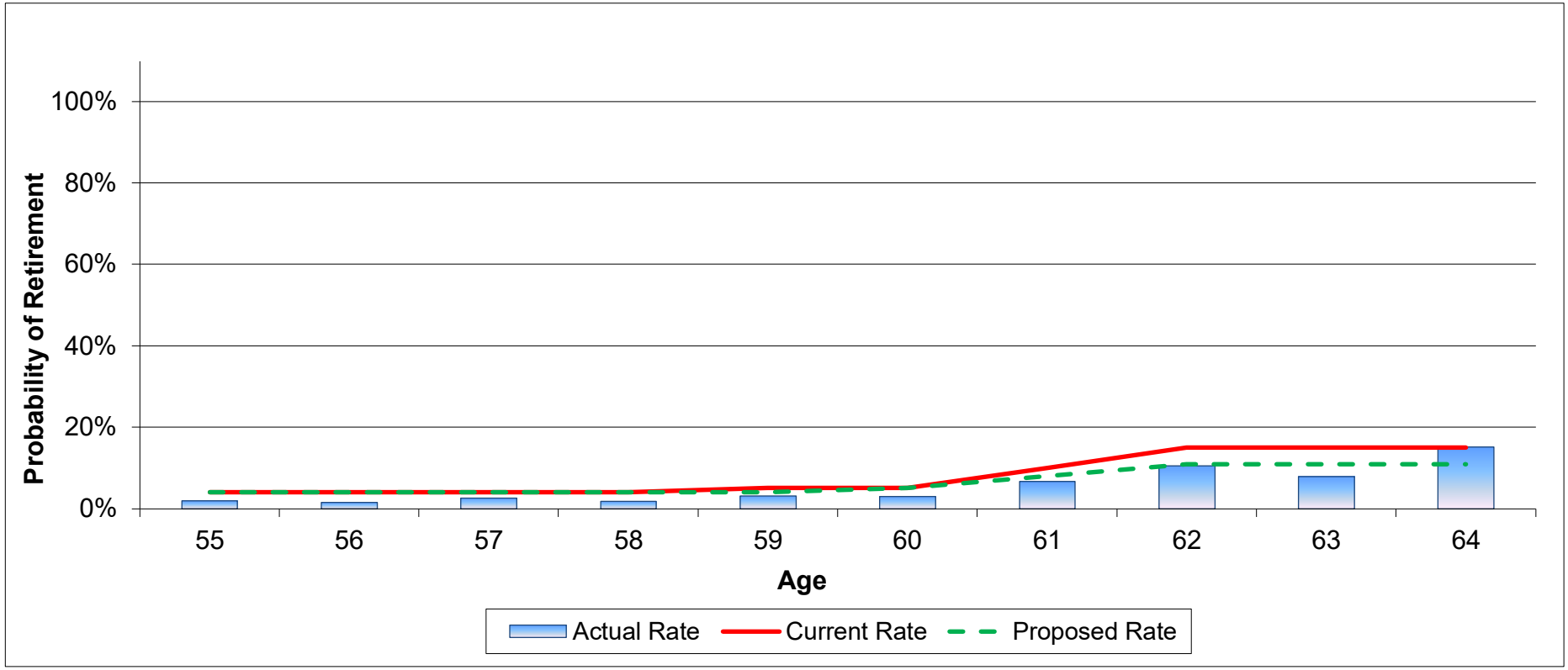
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-6

Retirement Rates - Early

Other Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	10,732	17,612	15,401
Actual/Expected		61%	70%

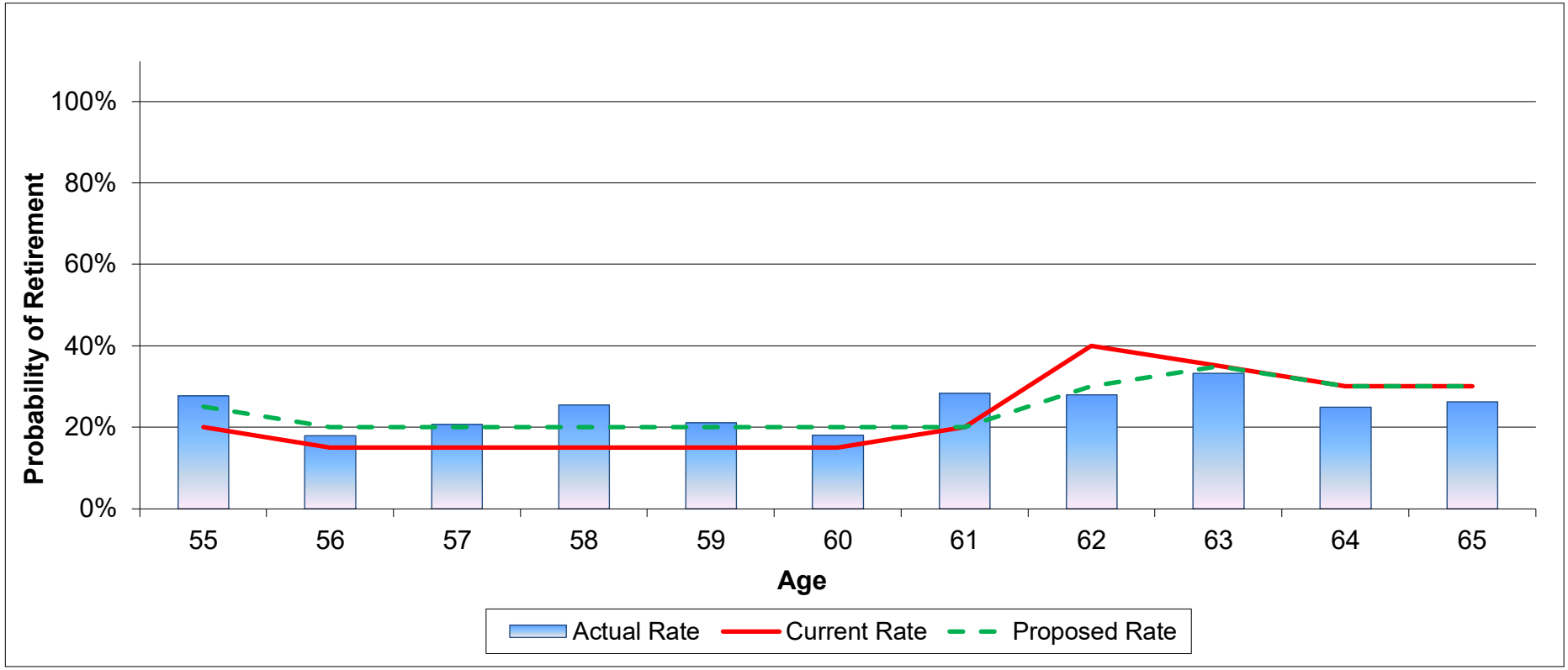
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-7

Retirement Rates - Select Unreduced

State Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	538	533	546
Actual/Expected		101%	99%

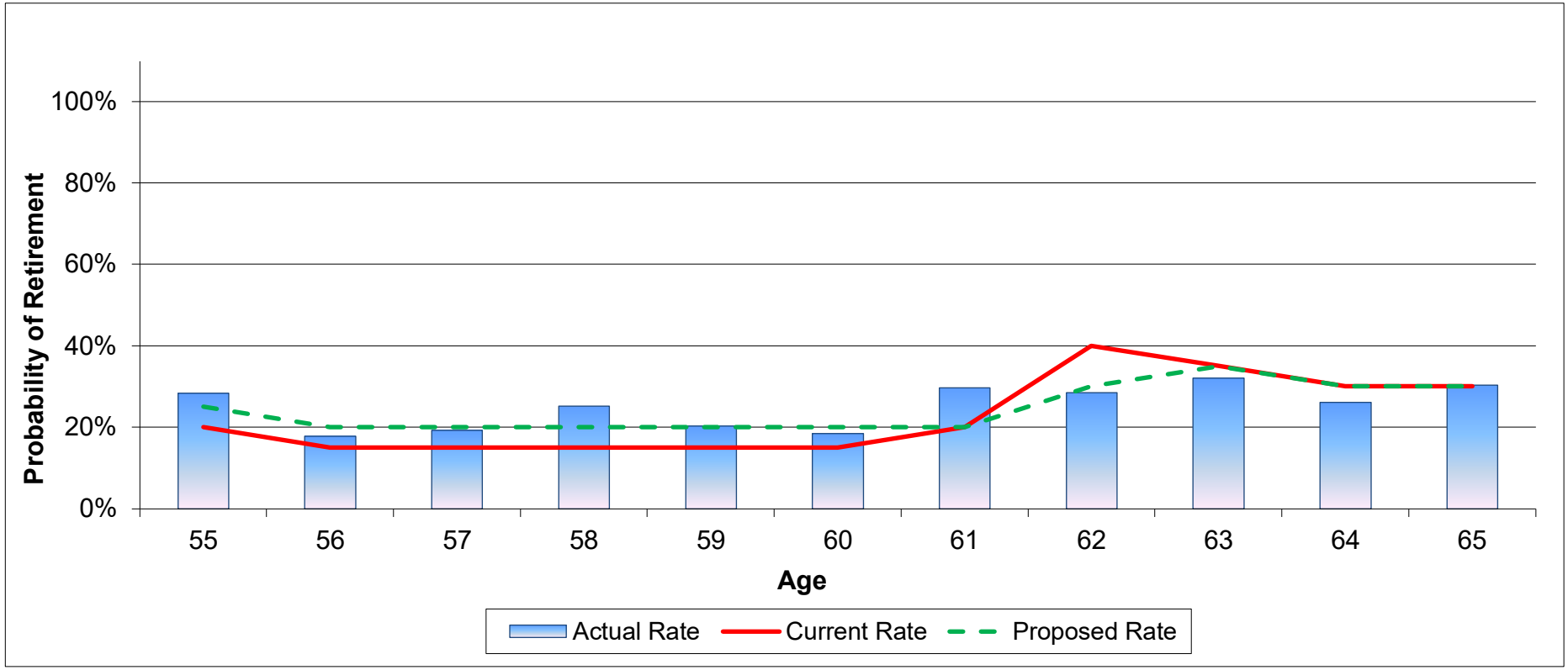
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-8

Retirement Rates - Select Unreduced

State Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	9,684	8,773	9,388
Actual/Expected		110%	103%

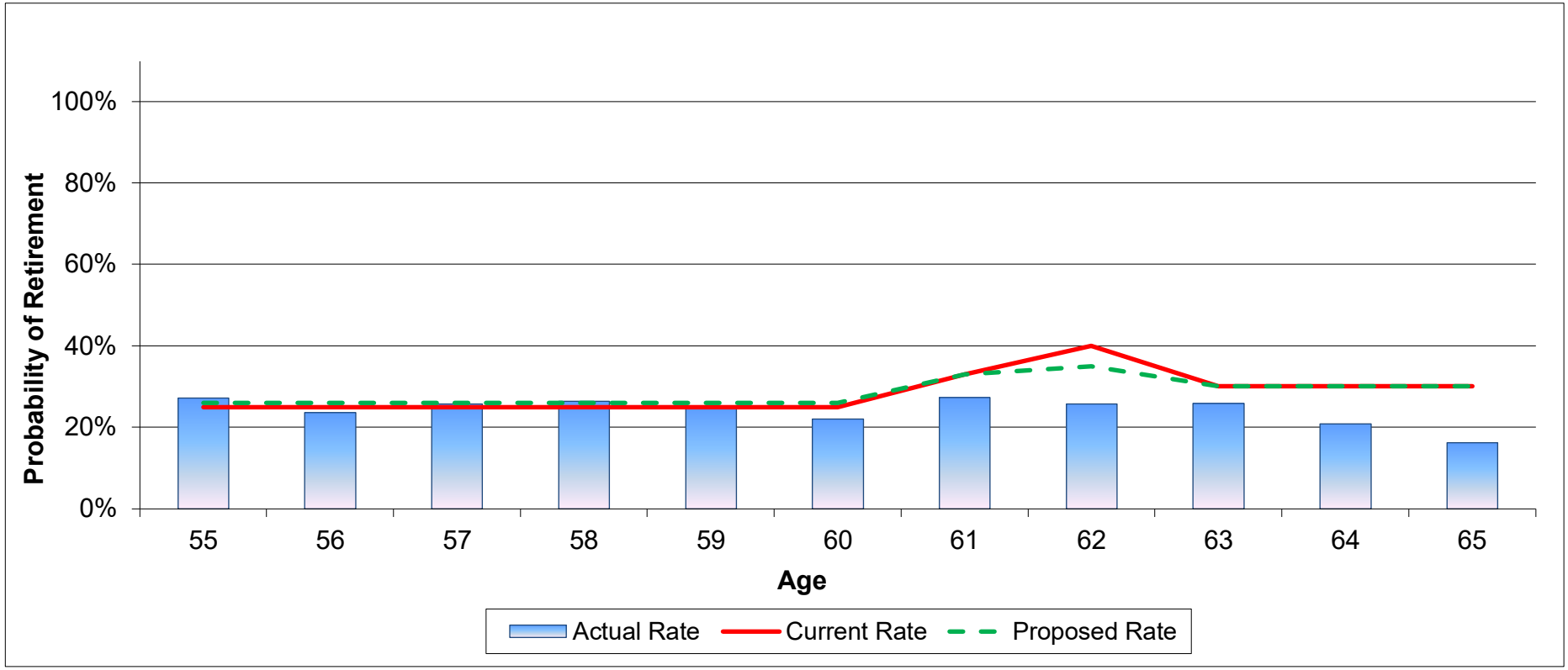
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-9

Retirement Rates - Select Unreduced

School Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,649	2,259	2,203
Actual/Expected		73%	75%

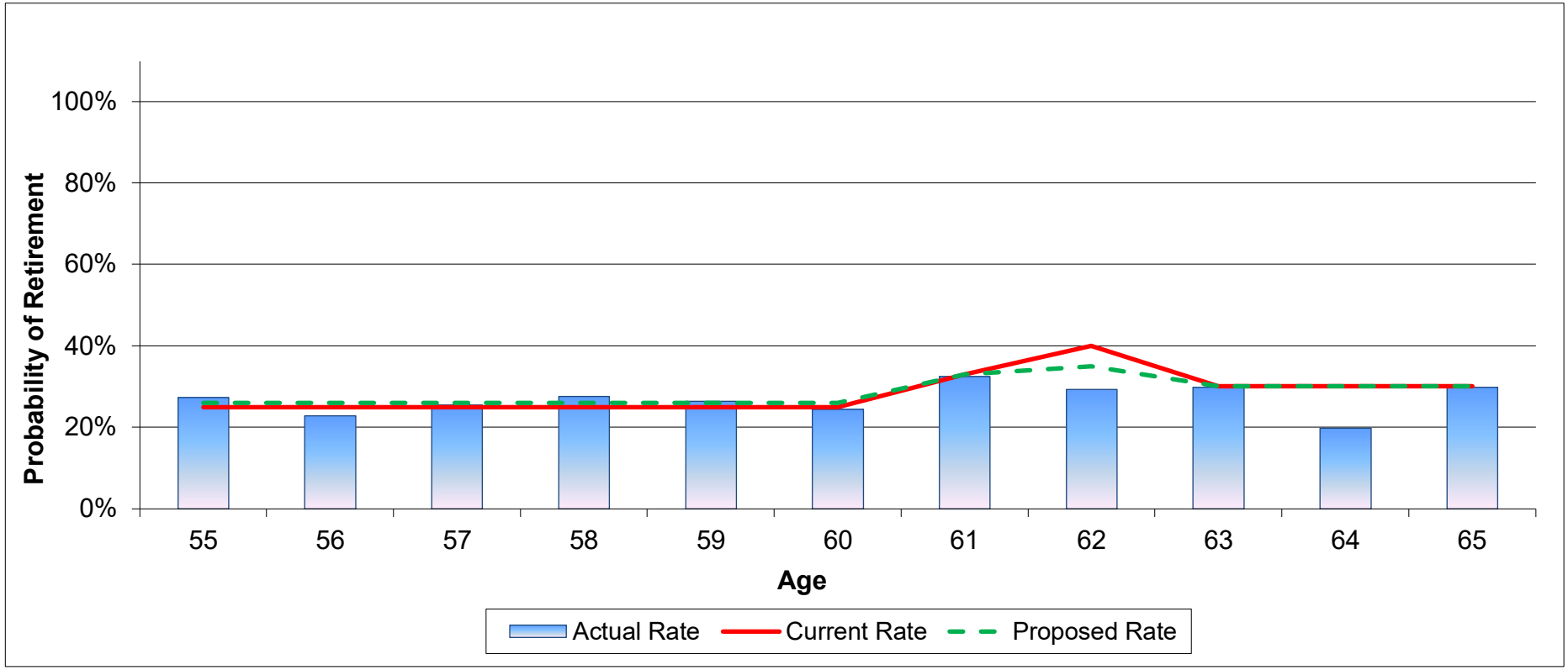
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-10

Retirement Rates - Select Unreduced

School Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	23,921	25,885	25,580
Actual/Expected		92%	94%

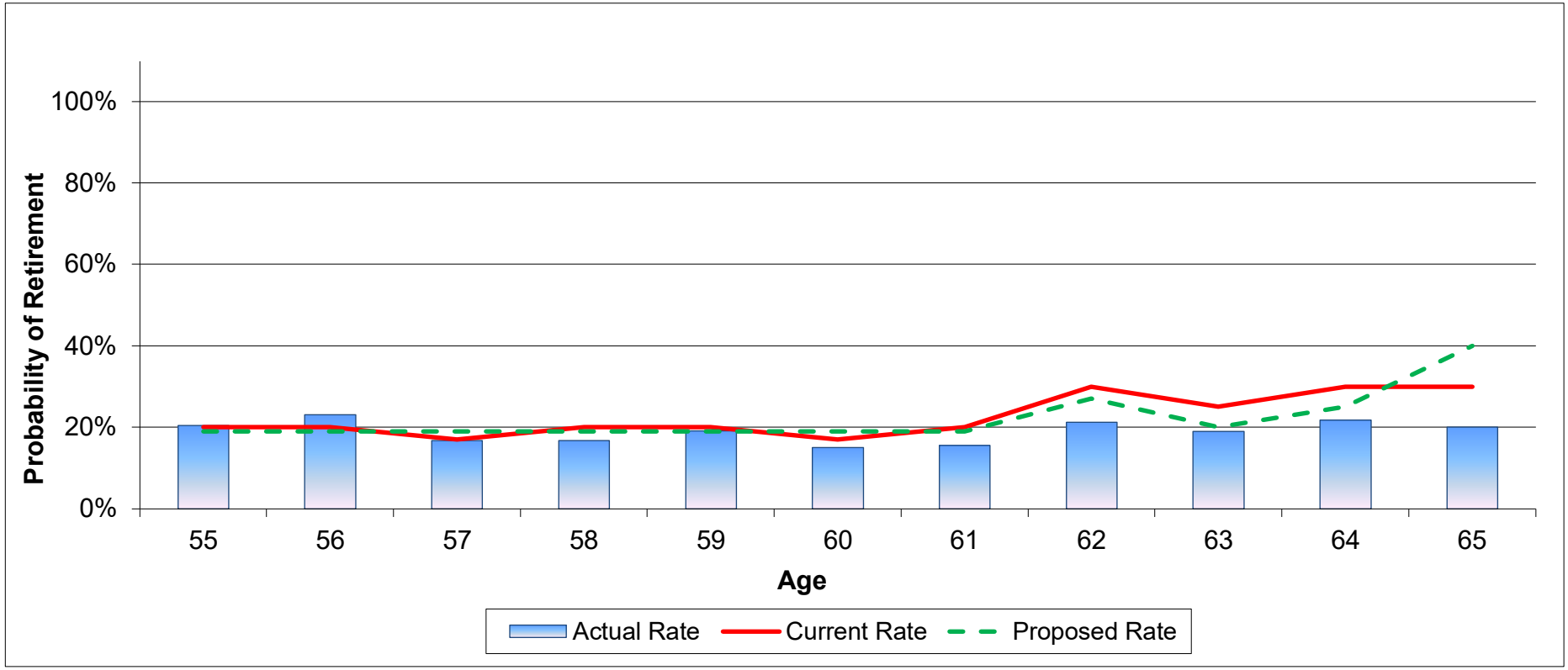
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-11

Retirement Rates - Select Unreduced

Other Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,049	1,403	1,579
Actual/Expected		75%	66%

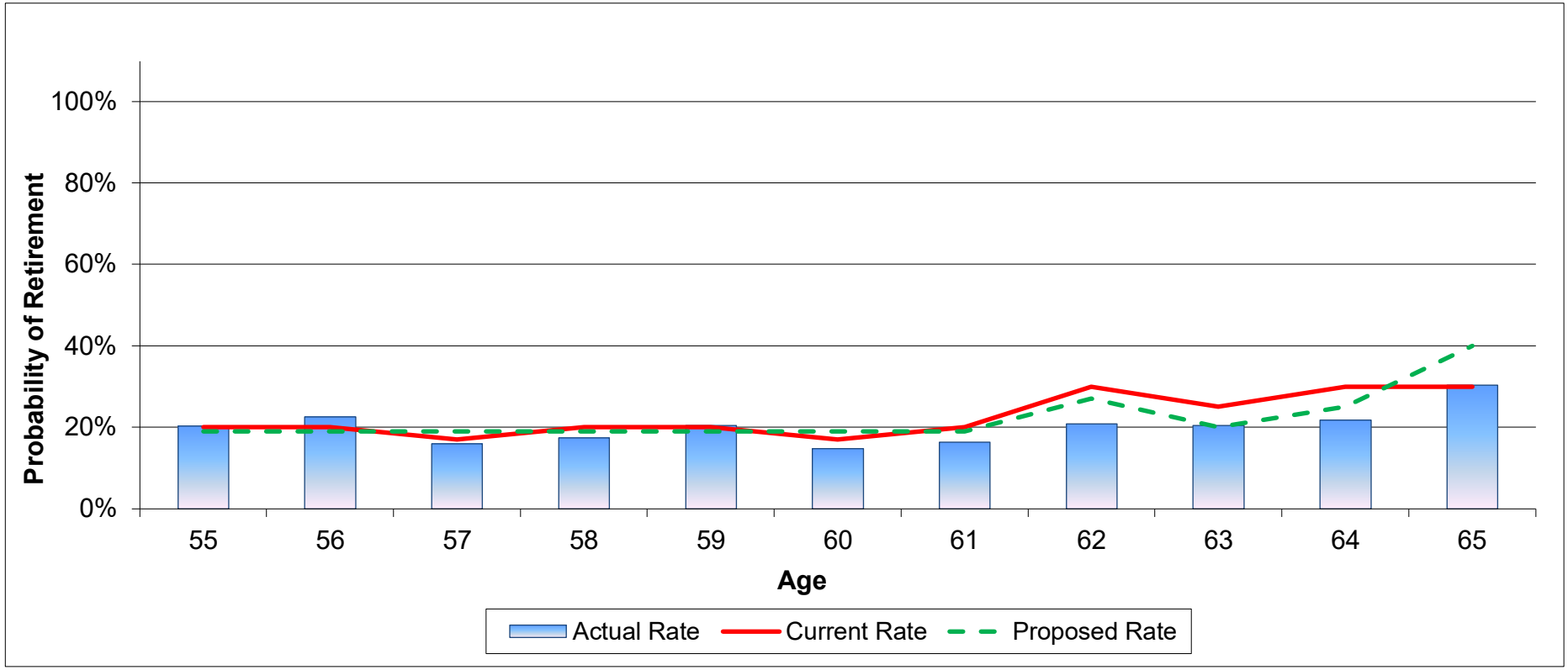
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-12

Retirement Rates - Select Unreduced

Other Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	12,295	13,965	14,244
Actual/Expected		88%	86%

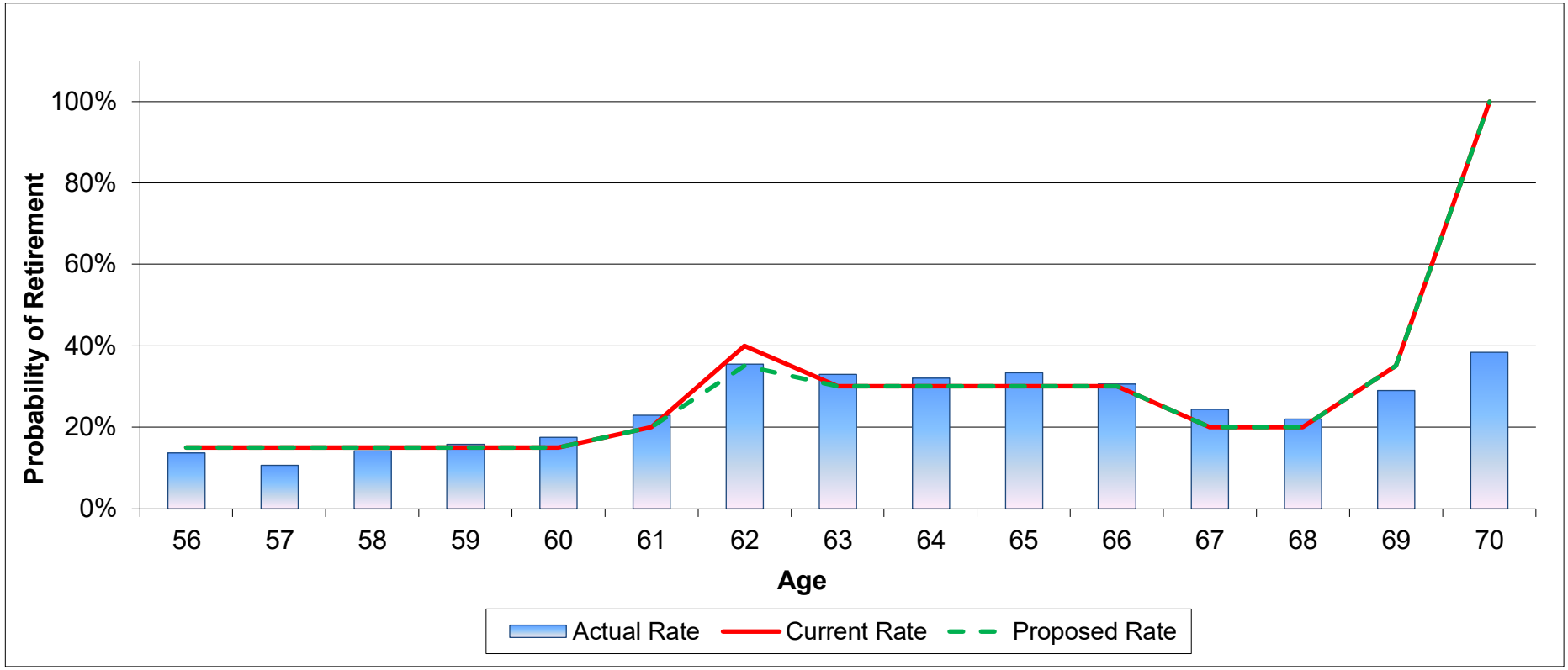
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-13

Retirement Rates - Ultimate Unreduced

State Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,737	1,829	1,801
Actual/Expected		95%	96%

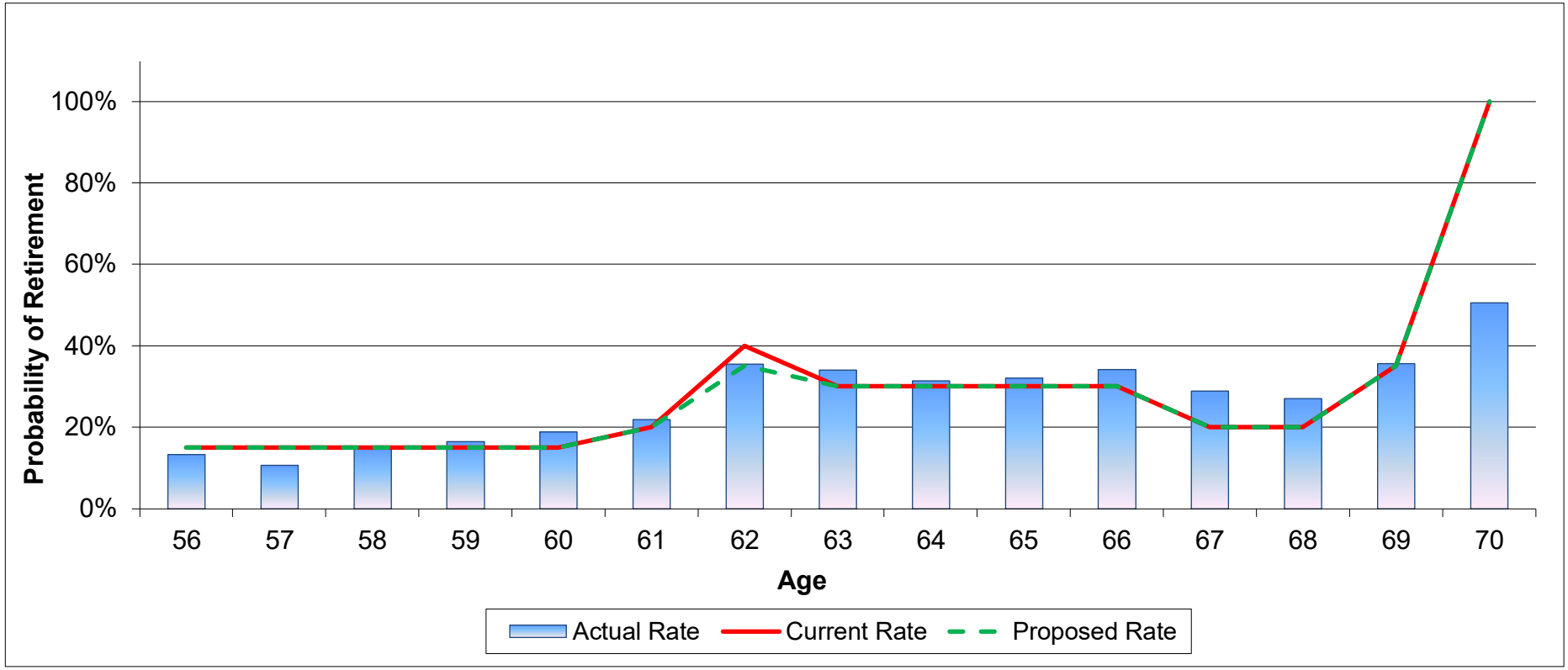
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-14

Retirement Rates - Ultimate Unreduced

State Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	39,028	38,120	37,410
Actual/Expected		102%	104%

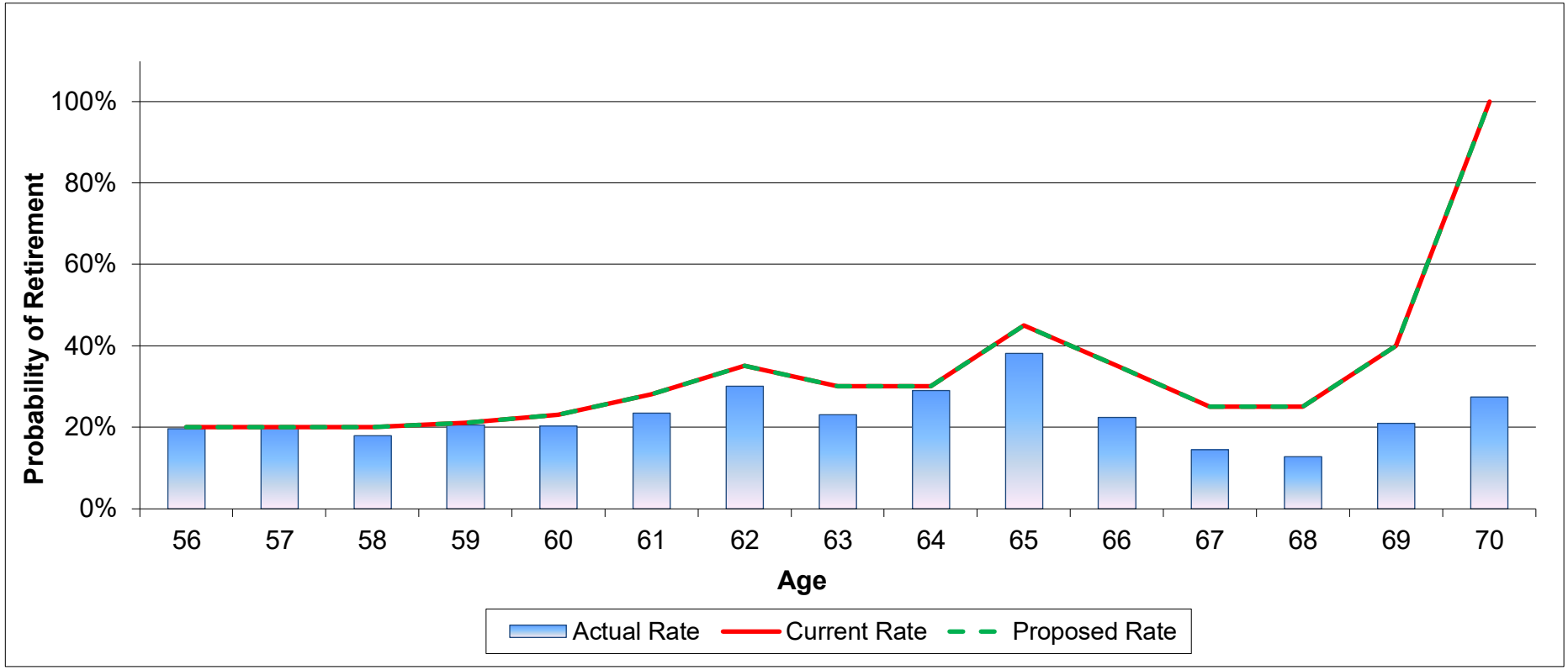
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-15

Retirement Rates - Ultimate Unreduced

School Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	4,904	7,499	7,499
Actual/Expected		65%	65%

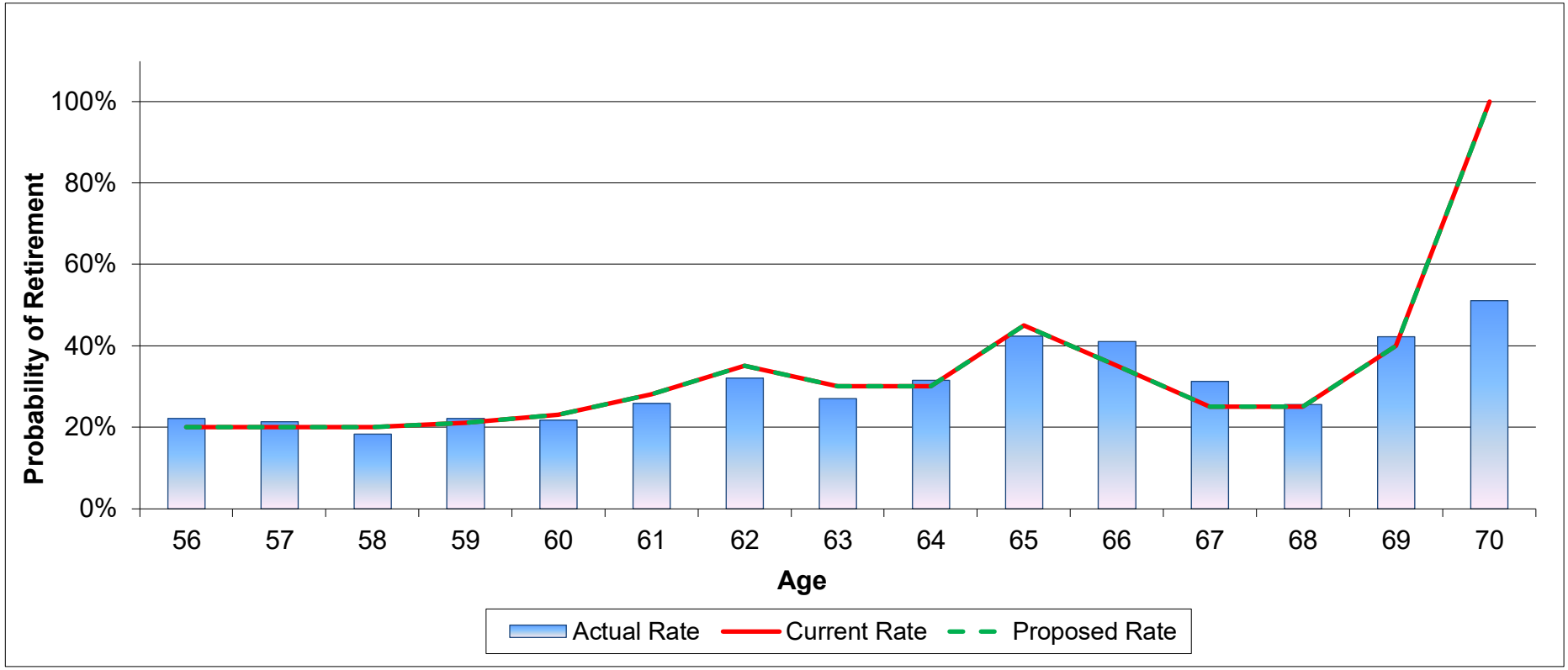
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-16

Retirement Rates - Ultimate Unreduced

School Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	81,154	83,825	83,825
Actual/Expected		97%	97%

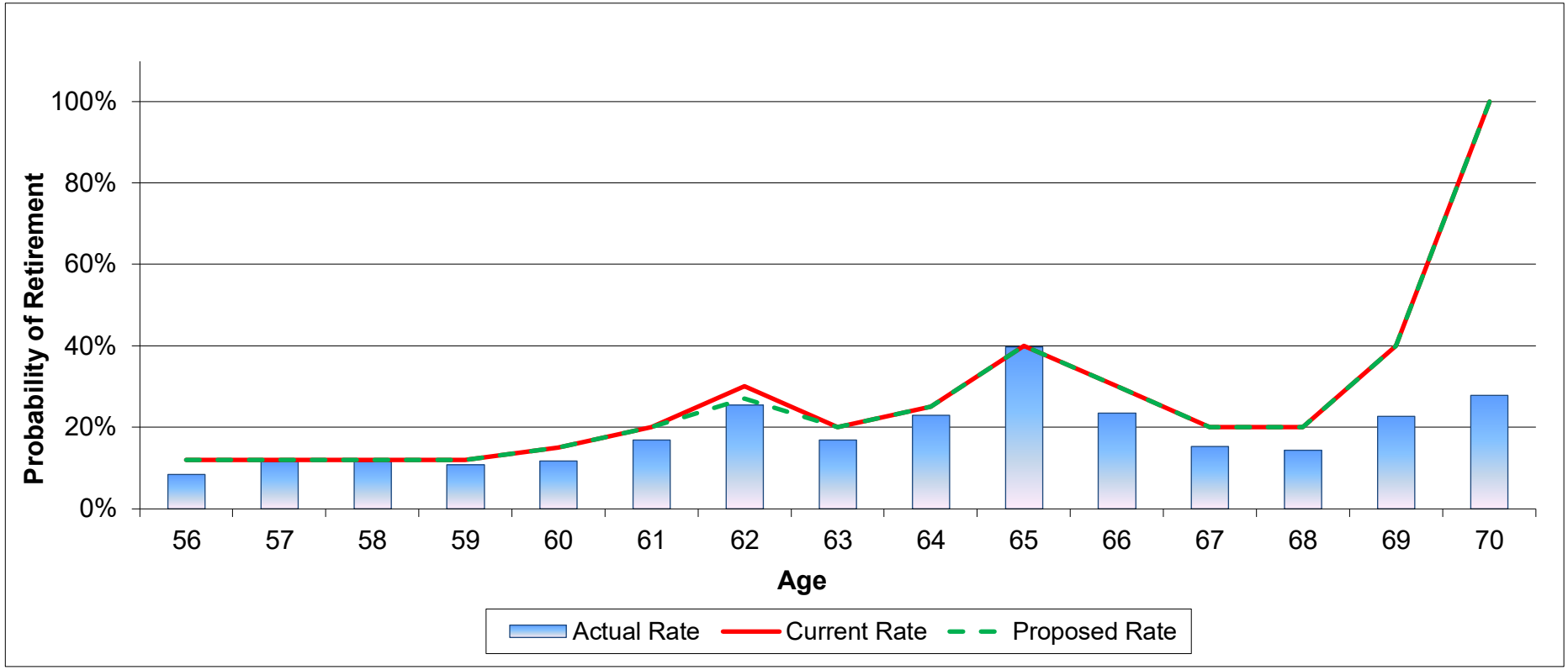
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-17

Retirement Rates - Ultimate Unreduced

Other Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	3,711	5,373	5,337
Actual/Expected		69%	70%

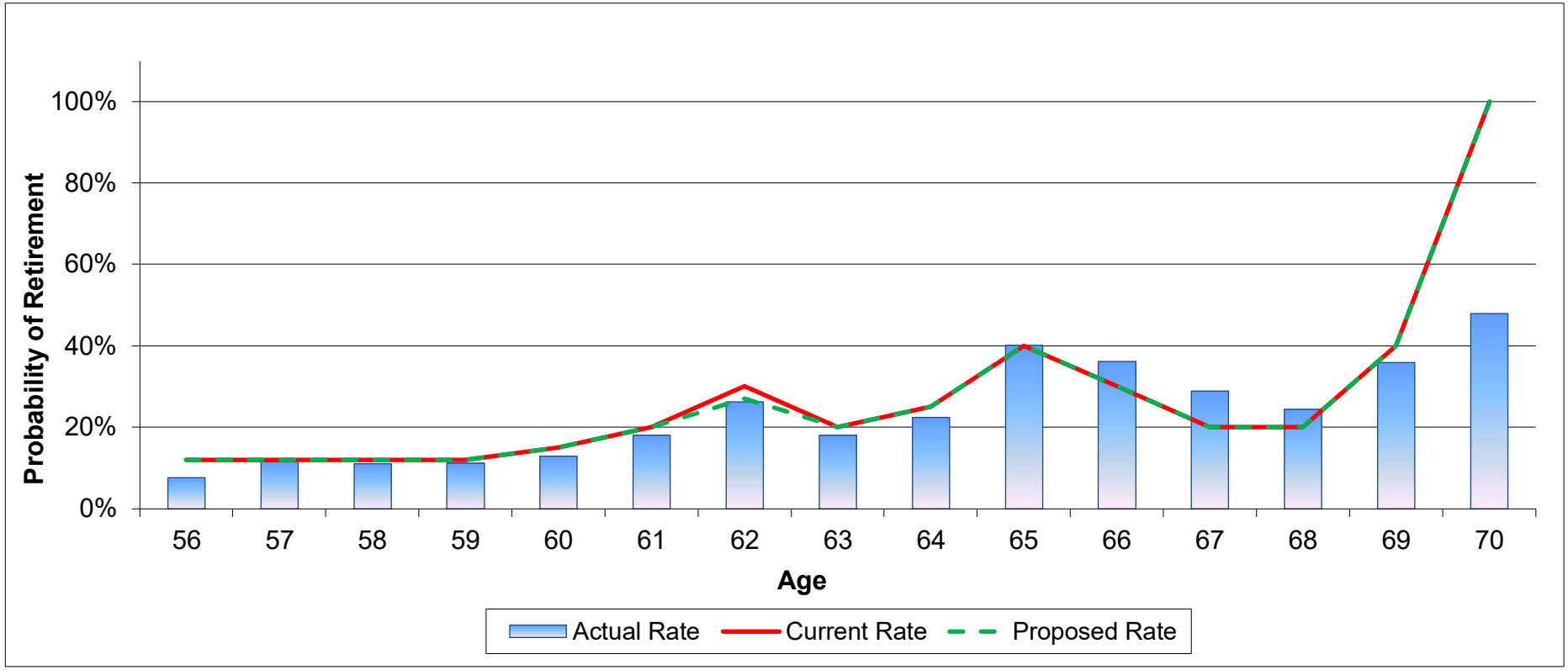
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-18

Retirement Rates - Ultimate Unreduced

Other Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	59,154	63,663	62,898
Actual/Expected		93%	94%

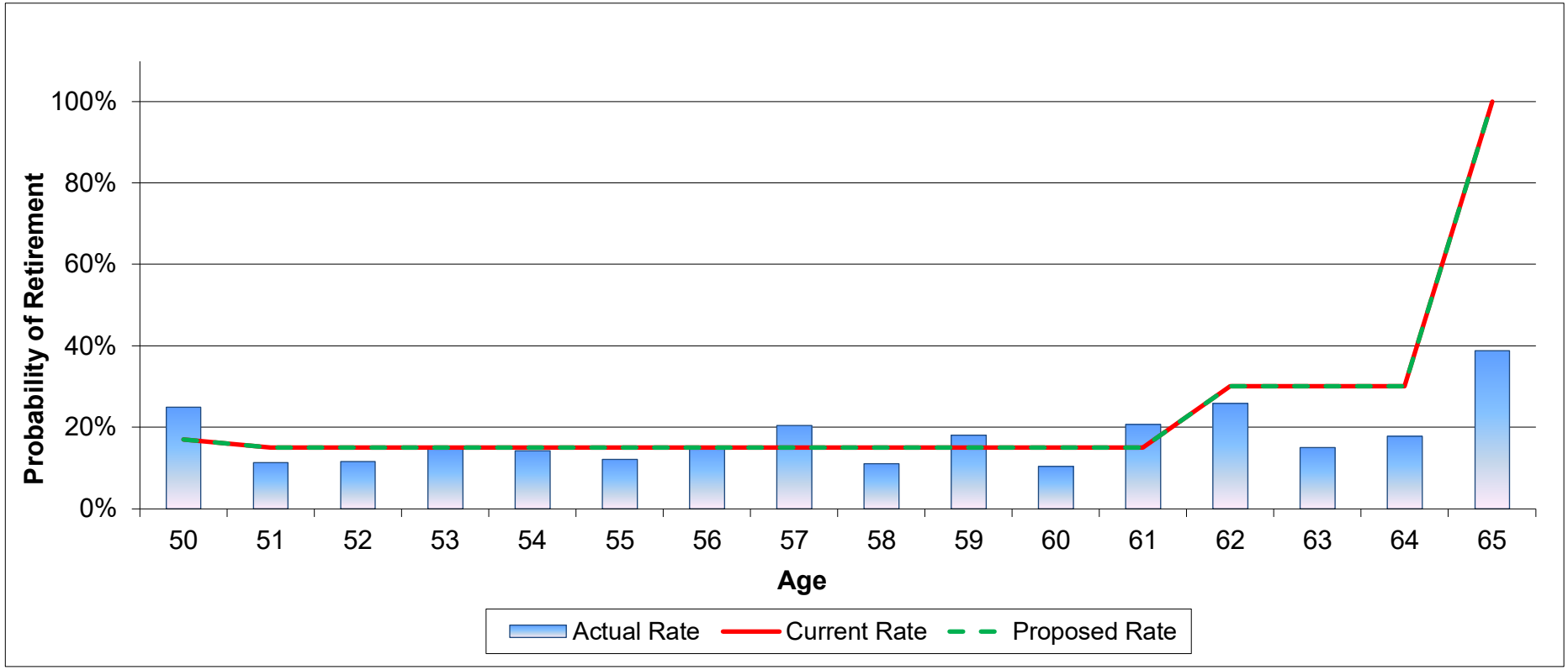
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-19

Retirement Rates

Sheriffs and Deputies



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	186	206	206
Actual/Expected		90%	90%

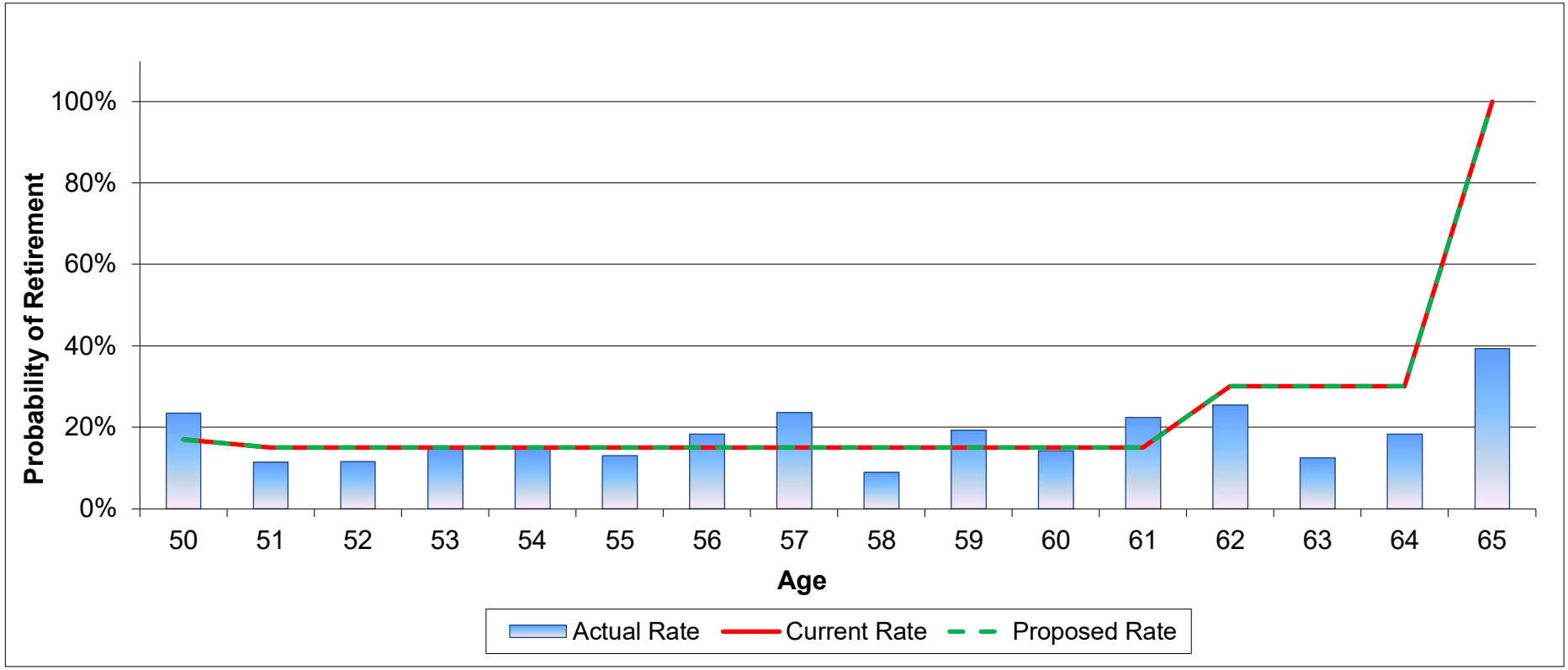
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-20

Retirement Rates

Sheriffs and Deputies (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	4,324	4,788	4,788
Actual/Expected		90%	90%

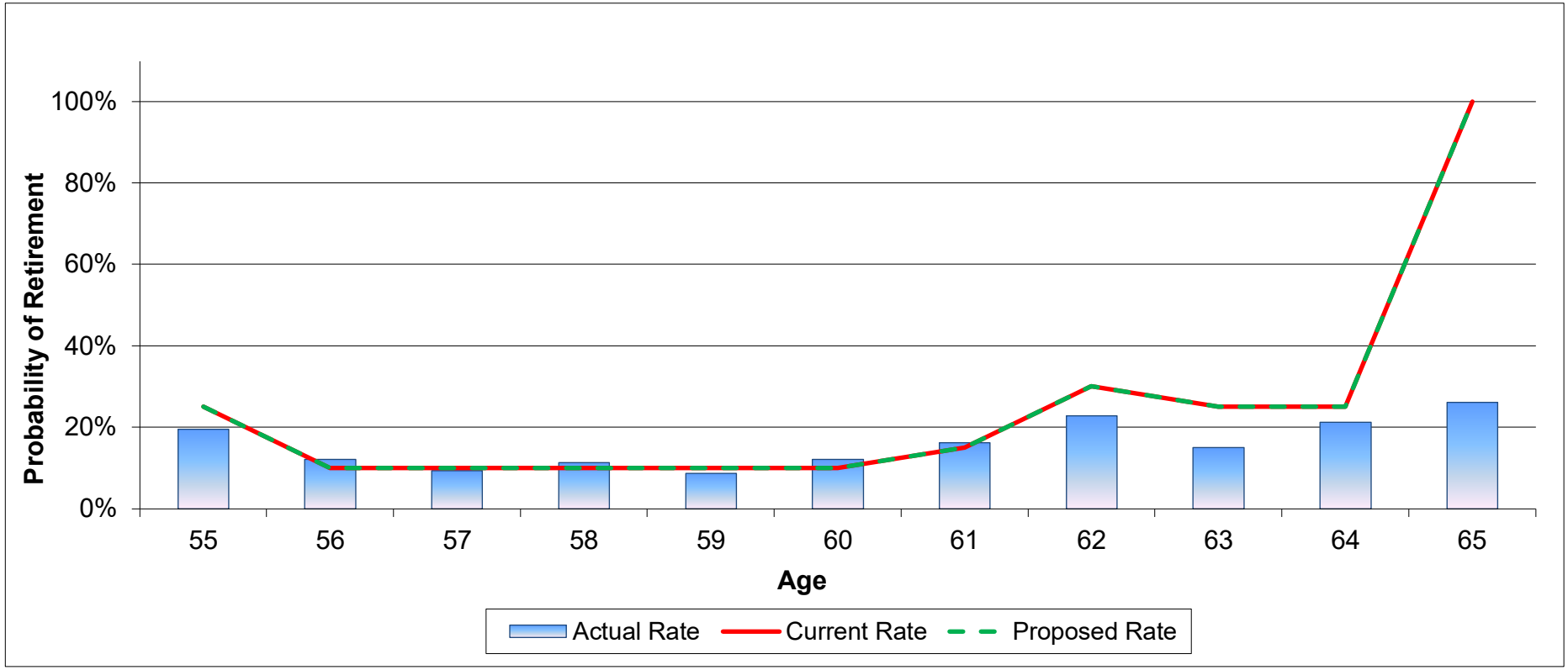
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-21

Retirement Rates

Protection Occupations



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	625	807	807
Actual/Expected		77%	77%

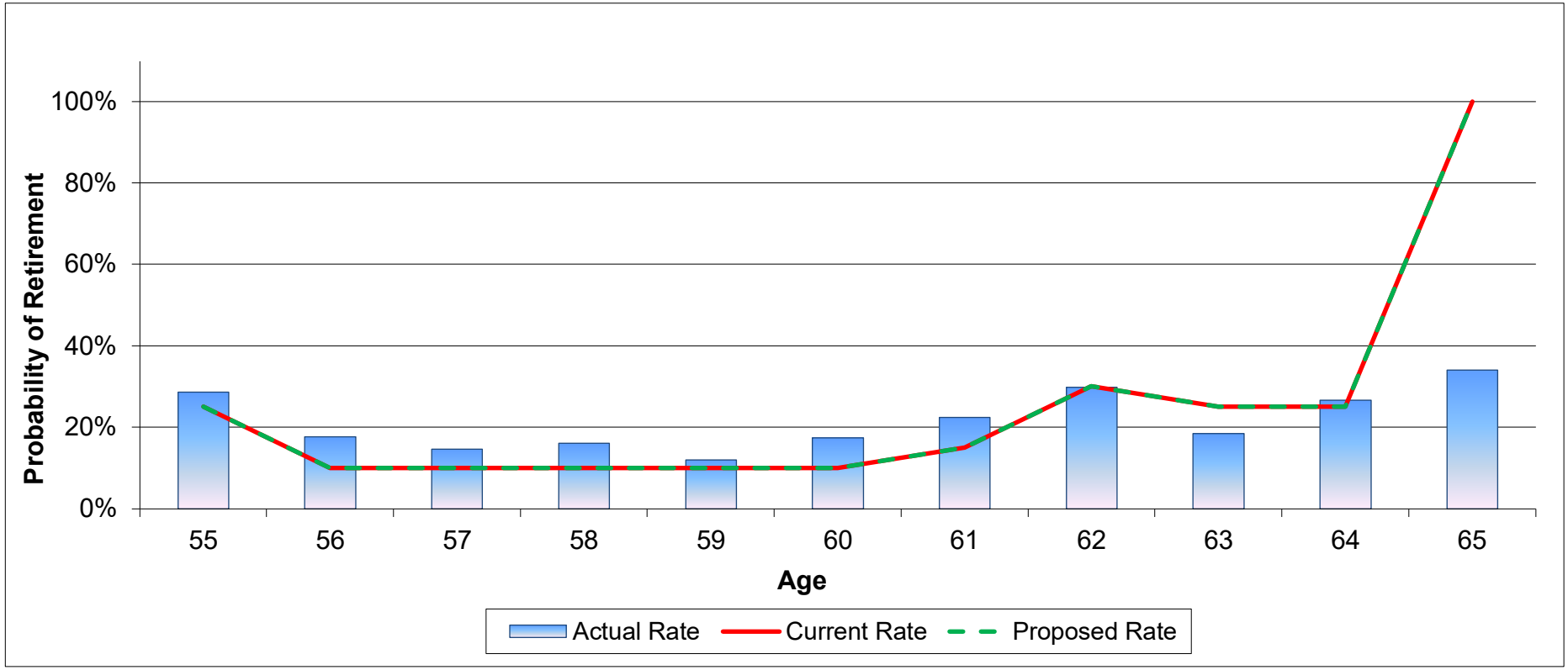
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit F-22

Retirement Rates

Protection Occupations (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	9,577	8,649	8,649
Actual/Expected		111%	111%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-1

Retirement Rates - Early

State Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	2,006	45	2.2%	100.3	5.0%	80.2	4.0%
56	1,843	43	2.3%	92.2	5.0%	73.7	4.0%
57	1,618	38	2.3%	80.9	5.0%	64.7	4.0%
58	1,512	40	2.6%	75.6	5.0%	60.5	4.0%
59	1,413	37	2.6%	70.7	5.0%	56.5	4.0%
60	1,330	57	4.3%	66.5	5.0%	66.5	5.0%
61	1,244	90	7.2%	186.6	15.0%	186.6	15.0%
62	730	61	8.4%	109.5	15.0%	109.5	15.0%
63	629	53	8.4%	94.4	15.0%	94.4	15.0%
64	527	69	13.1%	79.1	15.0%	79.1	15.0%
	12,852	533	4.1%	955.6	7.4%	871.7	6.8%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-2

Retirement Rates - Early

State Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	27,192	790	2.9%	1,359.6	5.0%	1,087.7	4.0%
56	22,949	690	3.0%	1,147.4	5.0%	917.9	4.0%
57	18,796	537	2.9%	939.8	5.0%	751.8	4.0%
58	16,324	547	3.4%	816.2	5.0%	652.9	4.0%
59	14,802	538	3.6%	740.1	5.0%	592.1	4.0%
60	13,703	671	4.9%	685.1	5.0%	685.1	5.0%
61	12,553	1,085	8.6%	1,883.0	15.0%	1,883.0	15.0%
62	5,328	559	10.5%	799.2	15.0%	799.2	15.0%
63	4,477	530	11.8%	671.6	15.0%	671.6	15.0%
64	3,618	604	16.7%	542.7	15.0%	542.7	15.0%
	139,741	6,553	4.7%	9,584.6	6.9%	8,584.0	6.1%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-3

Retirement Rates - Early

School Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	8,558	153	1.8%	513.5	6.0%	427.9	5.0%
56	7,976	134	1.7%	478.6	6.0%	398.8	5.0%
57	7,505	153	2.0%	450.3	6.0%	375.3	5.0%
58	7,145	156	2.2%	500.2	7.0%	357.3	5.0%
59	6,600	158	2.4%	528.0	8.0%	462.0	7.0%
60	5,960	193	3.2%	596.0	10.0%	596.0	10.0%
61	5,372	298	5.5%	805.8	15.0%	537.2	10.0%
62	3,458	227	6.6%	518.7	15.0%	449.5	13.0%
63	3,062	193	6.3%	459.3	15.0%	398.1	13.0%
64	2,626	241	9.2%	393.9	15.0%	393.9	15.0%
	58,262	1,906	3.3%	5,244.2	9.0%	4,395.9	7.5%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-4

Retirement Rates - Early

School Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	78,910	2,353	3.0%	4,734.6	6.0%	3,945.5	5.0%
56	62,587	1,867	3.0%	3,755.2	6.0%	3,129.3	5.0%
57	53,138	1,702	3.2%	3,188.3	6.0%	2,656.9	5.0%
58	47,247	1,547	3.3%	3,307.3	7.0%	2,362.3	5.0%
59	40,827	1,436	3.5%	3,266.2	8.0%	2,857.9	7.0%
60	34,167	1,955	5.7%	3,416.7	10.0%	3,416.7	10.0%
61	28,258	2,321	8.2%	4,238.7	15.0%	2,825.8	10.0%
62	10,499	1,162	11.1%	1,574.9	15.0%	1,364.9	13.0%
63	8,615	969	11.3%	1,292.2	15.0%	1,119.9	13.0%
64	6,851	1,166	17.0%	1,027.7	15.0%	1,027.7	15.0%
	371,099	16,479	4.4%	29,801.6	8.0%	24,706.9	6.7%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-5

Retirement Rates - Early

Other Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	5,743	63	1.1%	229.7	4.0%	229.7	4.0%
56	5,786	50	0.9%	231.4	4.0%	231.4	4.0%
57	5,651	88	1.6%	226.0	4.0%	226.0	4.0%
58	5,478	74	1.4%	219.1	4.0%	219.1	4.0%
59	5,180	107	2.1%	259.0	5.0%	207.2	4.0%
60	4,767	98	2.1%	238.4	5.0%	238.4	5.0%
61	4,334	181	4.2%	433.4	10.0%	346.7	8.0%
62	3,039	196	6.4%	455.9	15.0%	334.3	11.0%
63	2,707	133	4.9%	406.1	15.0%	297.8	11.0%
64	2,473	250	10.1%	371.0	15.0%	272.0	11.0%
	45,158	1,240	2.7%	3,069.9	6.8%	2,602.7	5.8%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-6

Retirement Rates - Early

Other Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	44,544	842	1.9%	1,781.8	4.0%	1,781.8	4.0%
56	42,833	645	1.5%	1,713.3	4.0%	1,713.3	4.0%
57	40,946	1,072	2.6%	1,637.8	4.0%	1,637.8	4.0%
58	37,761	688	1.8%	1,510.4	4.0%	1,510.4	4.0%
59	35,070	1,090	3.1%	1,753.5	5.0%	1,402.8	4.0%
60	31,114	942	3.0%	1,555.7	5.0%	1,555.7	5.0%
61	27,375	1,821	6.7%	2,737.5	10.0%	2,190.0	8.0%
62	12,573	1,331	10.6%	1,885.9	15.0%	1,383.0	11.0%
63	10,680	850	8.0%	1,602.1	15.0%	1,174.8	11.0%
64	9,558	1,452	15.2%	1,433.7	15.0%	1,051.3	11.0%
	292,454	10,732	3.7%	17,611.7	6.0%	15,401.0	5.3%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-7

Retirement Rates - Select Unreduced

State Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	274	76	27.7%	54.8	20.0%	68.5	25.0%
56	212	38	17.9%	31.8	15.0%	42.4	20.0%
57	179	37	20.7%	26.9	15.0%	35.8	20.0%
58	165	42	25.5%	24.8	15.0%	33.0	20.0%
59	137	29	21.2%	20.6	15.0%	27.4	20.0%
60	116	21	18.1%	17.4	15.0%	23.2	20.0%
61	88	25	28.4%	17.6	20.0%	17.6	20.0%
62	410	115	28.0%	164.0	40.0%	123.0	30.0%
63	63	21	33.3%	22.1	35.0%	22.1	35.0%
64	40	10	25.0%	12.0	30.0%	12.0	30.0%
65	471	124	26.3%	141.3	30.0%	141.3	30.0%
	2,155	538	25.0%	533.1	24.7%	546.3	25.3%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-8

Retirement Rates - Select Unreduced

State Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	6,854	1,944	28.4%	1,370.8	20.0%	1,713.5	25.0%
56	5,257	935	17.8%	788.5	15.0%	1,051.4	20.0%
57	4,437	857	19.3%	665.5	15.0%	887.3	20.0%
58	3,980	1,004	25.2%	597.0	15.0%	796.0	20.0%
59	2,927	594	20.3%	439.1	15.0%	585.5	20.0%
60	2,272	421	18.5%	340.8	15.0%	454.4	20.0%
61	1,689	502	29.7%	337.8	20.0%	337.8	20.0%
62	6,712	1,912	28.5%	2,684.9	40.0%	2,013.7	30.0%
63	900	289	32.1%	314.9	35.0%	314.9	35.0%
64	519	136	26.2%	155.8	30.0%	155.8	30.0%
65	3,594	1,089	30.3%	1,078.2	30.0%	1,078.2	30.0%
	39,141	9,684	24.7%	8,773.4	22.4%	9,388.5	24.0%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-9

Retirement Rates - Select Unreduced

School Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	419	114	27.2%	104.8	25.0%	108.9	26.0%
56	761	180	23.7%	190.3	25.0%	197.9	26.0%
57	439	113	25.7%	109.8	25.0%	114.1	26.0%
58	352	93	26.4%	88.0	25.0%	91.5	26.0%
59	325	80	24.6%	81.3	25.0%	84.5	26.0%
60	368	81	22.0%	92.0	25.0%	95.7	26.0%
61	366	100	27.3%	120.8	33.0%	120.8	33.0%
62	1,656	427	25.8%	662.4	40.0%	579.6	35.0%
63	162	42	25.9%	48.6	30.0%	48.6	30.0%
64	149	31	20.8%	44.7	30.0%	44.7	30.0%
65	2,389	388	16.2%	716.7	30.0%	716.7	30.0%
	7,386	1,649	22.3%	2,259.2	30.6%	2,203.0	29.8%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-10

Retirement Rates - Select Unreduced

School Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	10,036	2,742	27.3%	2,509.0	25.0%	2,609.4	26.0%
56	18,643	4,250	22.8%	4,660.7	25.0%	4,847.2	26.0%
57	10,012	2,547	25.4%	2,502.9	25.0%	2,603.1	26.0%
58	7,245	1,995	27.5%	1,811.3	25.0%	1,883.7	26.0%
59	6,002	1,587	26.4%	1,500.6	25.0%	1,560.6	26.0%
60	6,177	1,505	24.4%	1,544.2	25.0%	1,606.0	26.0%
61	4,888	1,586	32.5%	1,613.2	33.0%	1,613.2	33.0%
62	17,716	5,191	29.3%	7,086.3	40.0%	6,200.5	35.0%
63	1,235	369	29.8%	370.6	30.0%	370.6	30.0%
64	1,262	249	19.7%	378.7	30.0%	378.7	30.0%
65	6,359	1,899	29.9%	1,907.7	30.0%	1,907.7	30.0%
	89,576	23,921	26.7%	25,885.1	28.9%	25,580.5	28.6%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-11

Retirement Rates - Select Unreduced

Other Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	299	61	20.4%	59.8	20.0%	56.8	19.0%
56	208	48	23.1%	41.6	20.0%	39.5	19.0%
57	227	38	16.7%	38.6	17.0%	43.1	19.0%
58	227	38	16.7%	45.4	20.0%	43.1	19.0%
59	256	49	19.1%	51.2	20.0%	48.6	19.0%
60	272	41	15.1%	46.2	17.0%	51.7	19.0%
61	257	40	15.6%	51.4	20.0%	48.8	19.0%
62	1,091	232	21.3%	327.3	30.0%	294.6	27.0%
63	137	26	19.0%	34.3	25.0%	27.4	20.0%
64	124	27	21.8%	37.2	30.0%	31.0	25.0%
65	2,235	449	20.1%	670.5	30.0%	894.0	40.0%
	5,333	1,049	19.7%	1,403.5	26.3%	1,578.7	29.6%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-12

Retirement Rates - Select Unreduced

Other Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	6,499	1,320	20.3%	1,299.7	20.0%	1,234.7	19.0%
56	4,439	1,001	22.5%	887.8	20.0%	843.4	19.0%
57	4,664	746	16.0%	792.9	17.0%	886.1	19.0%
58	4,564	792	17.4%	912.9	20.0%	867.2	19.0%
59	4,856	991	20.4%	971.2	20.0%	922.7	19.0%
60	4,548	672	14.8%	773.2	17.0%	864.2	19.0%
61	4,167	680	16.3%	833.5	20.0%	791.8	19.0%
62	13,745	2,858	20.8%	4,123.4	30.0%	3,711.1	27.0%
63	1,309	268	20.5%	327.4	25.0%	261.9	20.0%
64	1,306	285	21.8%	391.7	30.0%	326.4	25.0%
65	8,837	2,681	30.3%	2,651.0	30.0%	3,534.7	40.0%
	58,934	12,295	20.9%	13,964.6	23.7%	14,244.2	24.2%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-13

Retirement Rates - Ultimate Unreduced

State Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
56	240	33	13.8%	36.0	15.0%	36.0	15.0%
57	424	45	10.6%	63.6	15.0%	63.6	15.0%
58	564	80	14.2%	84.6	15.0%	84.6	15.0%
59	615	97	15.8%	92.3	15.0%	92.3	15.0%
60	654	115	17.6%	98.1	15.0%	98.1	15.0%
61	635	146	23.0%	127.0	20.0%	127.0	20.0%
62	557	198	35.5%	222.8	40.0%	195.0	35.0%
63	650	215	33.1%	195.0	30.0%	195.0	30.0%
64	473	152	32.1%	141.9	30.0%	141.9	30.0%
65	365	122	33.4%	109.5	30.0%	109.5	30.0%
66	621	190	30.6%	186.3	30.0%	186.3	30.0%
67	427	104	24.4%	85.4	20.0%	85.4	20.0%
68	327	72	22.0%	65.4	20.0%	65.4	20.0%
69	286	83	29.0%	100.1	35.0%	100.1	35.0%
70	221	85	38.5%	221.0	100.0%	221.0	100.0%
	7,059	1,737	24.6%	1,829.0	25.9%	1,801.1	25.5%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-14

Retirement Rates - Ultimate Unreduced

State Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
56	6,098	816	13.4%	914.7	15.0%	914.7	15.0%
57	11,089	1,182	10.7%	1,663.3	15.0%	1,663.3	15.0%
58	15,031	2,244	14.9%	2,254.6	15.0%	2,254.6	15.0%
59	16,523	2,722	16.5%	2,478.5	15.0%	2,478.5	15.0%
60	17,379	3,270	18.8%	2,606.9	15.0%	2,606.9	15.0%
61	16,284	3,569	21.9%	3,256.9	20.0%	3,256.9	20.0%
62	14,190	5,034	35.5%	5,675.8	40.0%	4,966.4	35.0%
63	14,317	4,887	34.1%	4,295.1	30.0%	4,295.1	30.0%
64	10,611	3,338	31.5%	3,183.2	30.0%	3,183.2	30.0%
65	8,287	2,657	32.1%	2,486.1	30.0%	2,486.1	30.0%
66	9,424	3,222	34.2%	2,827.2	30.0%	2,827.2	30.0%
67	6,535	1,889	28.9%	1,307.0	20.0%	1,307.0	20.0%
68	4,878	1,318	27.0%	975.6	20.0%	975.6	20.0%
69	4,228	1,507	35.6%	1,480.0	35.0%	1,480.0	35.0%
70	2,715	1,375	50.6%	2,714.8	100.0%	2,714.8	100.0%
	157,589	39,028	24.8%	38,119.7	24.2%	37,410.2	23.7%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-15

Retirement Rates - Ultimate Unreduced

School Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
56	356	70	19.7%	71.2	20.0%	71.2	20.0%
57	901	182	20.2%	180.2	20.0%	180.2	20.0%
58	1,079	193	17.9%	215.8	20.0%	215.8	20.0%
59	1,135	233	20.5%	238.4	21.0%	238.4	21.0%
60	1,152	234	20.3%	265.0	23.0%	265.0	23.0%
61	1,203	283	23.5%	336.8	28.0%	336.8	28.0%
62	1,171	353	30.1%	409.9	35.0%	409.9	35.0%
63	2,013	464	23.1%	603.9	30.0%	603.9	30.0%
64	1,614	469	29.1%	484.2	30.0%	484.2	30.0%
65	1,248	477	38.2%	561.6	45.0%	561.6	45.0%
66	2,765	621	22.5%	967.8	35.0%	967.8	35.0%
67	2,171	316	14.6%	542.8	25.0%	542.8	25.0%
68	1,891	243	12.9%	472.8	25.0%	472.8	25.0%
69	1,776	372	20.9%	710.4	40.0%	710.4	40.0%
70	1,438	394	27.4%	1,438.0	100.0%	1,438.0	100.0%
	21,913	4,904	22.4%	7,498.6	34.2%	7,498.6	34.2%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-16

Retirement Rates - Ultimate Unreduced

School Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
56	8,822	1,954	22.2%	1,764.3	20.0%	1,764.3	20.0%
57	22,883	4,892	21.4%	4,576.7	20.0%	4,576.7	20.0%
58	27,438	5,048	18.4%	5,487.6	20.0%	5,487.6	20.0%
59	28,842	6,409	22.2%	6,056.9	21.0%	6,056.9	21.0%
60	28,205	6,157	21.8%	6,487.2	23.0%	6,487.2	23.0%
61	28,281	7,302	25.8%	7,918.8	28.0%	7,918.8	28.0%
62	25,422	8,147	32.0%	8,897.7	35.0%	8,897.7	35.0%
63	31,218	8,460	27.1%	9,365.5	30.0%	9,365.5	30.0%
64	24,415	7,695	31.5%	7,324.5	30.0%	7,324.5	30.0%
65	19,126	8,117	42.4%	8,606.6	45.0%	8,606.6	45.0%
66	16,408	6,739	41.1%	5,742.7	35.0%	5,742.7	35.0%
67	10,128	3,175	31.3%	2,531.9	25.0%	2,531.9	25.0%
68	7,642	1,954	25.6%	1,910.6	25.0%	1,910.6	25.0%
69	6,636	2,804	42.3%	2,654.3	40.0%	2,654.3	40.0%
70	4,500	2,301	51.1%	4,499.7	100.0%	4,499.7	100.0%
	289,966	81,154	28.0%	83,824.9	28.9%	83,824.9	28.9%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-17

Retirement Rates - Ultimate Unreduced

Other Membership

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
56	275	23	8.4%	33.0	12.0%	33.0	12.0%
57	467	54	11.6%	56.0	12.0%	56.0	12.0%
58	655	76	11.6%	78.6	12.0%	78.6	12.0%
59	807	87	10.8%	96.8	12.0%	96.8	12.0%
60	998	117	11.7%	149.7	15.0%	149.7	15.0%
61	1,124	190	16.9%	224.8	20.0%	224.8	20.0%
62	1,190	303	25.5%	357.0	30.0%	321.3	27.0%
63	1,732	293	16.9%	346.4	20.0%	346.4	20.0%
64	1,512	348	23.0%	378.0	25.0%	378.0	25.0%
65	1,204	479	39.8%	481.6	40.0%	481.6	40.0%
66	2,467	578	23.4%	740.1	30.0%	740.1	30.0%
67	1,893	289	15.3%	378.6	20.0%	378.6	20.0%
68	1,573	226	14.4%	314.6	20.0%	314.6	20.0%
69	1,431	324	22.6%	572.4	40.0%	572.4	40.0%
70	1,165	324	27.8%	1,165.0	100.0%	1,165.0	100.0%
	18,493	3,711	20.1%	5,372.7	29.1%	5,337.0	28.9%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-18

Retirement Rates - Ultimate Unreduced

Other Membership (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
56	6,169	472	7.7%	740.3	12.0%	740.3	12.0%
57	10,804	1,250	11.6%	1,296.5	12.0%	1,296.5	12.0%
58	15,417	1,712	11.1%	1,850.1	12.0%	1,850.1	12.0%
59	19,149	2,136	11.2%	2,297.9	12.0%	2,297.9	12.0%
60	22,888	2,958	12.9%	3,433.2	15.0%	3,433.2	15.0%
61	24,800	4,488	18.1%	4,960.0	20.0%	4,960.0	20.0%
62	25,518	6,687	26.2%	7,655.5	30.0%	6,889.9	27.0%
63	31,491	5,691	18.1%	6,298.3	20.0%	6,298.3	20.0%
64	27,569	6,191	22.5%	6,892.3	25.0%	6,892.3	25.0%
65	22,333	8,954	40.1%	8,933.0	40.0%	8,933.0	40.0%
66	19,749	7,157	36.2%	5,924.7	30.0%	5,924.7	30.0%
67	12,258	3,544	28.9%	2,451.7	20.0%	2,451.7	20.0%
68	8,906	2,177	24.4%	1,781.2	20.0%	1,781.2	20.0%
69	8,077	2,898	35.9%	3,230.7	40.0%	3,230.7	40.0%
70	5,918	2,840	48.0%	5,917.9	100.0%	5,917.9	100.0%
	261,048	59,154	22.7%	63,663.3	24.4%	62,897.8	24.1%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-19

Retirement Rates

Sheriffs and Deputies

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
50	112	28	25.0%	19.0	17.0%	19.0	17.0%
51	97	11	11.3%	14.6	15.0%	14.6	15.0%
52	95	11	11.6%	14.3	15.0%	14.3	15.0%
53	89	13	14.6%	13.4	15.0%	13.4	15.0%
54	84	12	14.3%	12.6	15.0%	12.6	15.0%
55	107	13	12.1%	16.1	15.0%	16.1	15.0%
56	98	15	15.3%	14.7	15.0%	14.7	15.0%
57	78	16	20.5%	11.7	15.0%	11.7	15.0%
58	63	7	11.1%	9.5	15.0%	9.5	15.0%
59	61	11	18.0%	9.2	15.0%	9.2	15.0%
60	58	6	10.3%	8.7	15.0%	8.7	15.0%
61	53	11	20.8%	8.0	15.0%	8.0	15.0%
62	54	14	25.9%	16.2	30.0%	16.2	30.0%
63	40	6	15.0%	12.0	30.0%	12.0	30.0%
64	28	5	17.9%	8.4	30.0%	8.4	30.0%
65	18	7	38.9%	18.0	100.0%	18.0	100.0%
	1,135	186	16.4%	206.1	18.2%	206.1	18.2%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-20

Retirement Rates

Sheriffs and Deputies (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
50	2,260	532	23.5%	384.2	17.0%	384.2	17.0%
51	2,029	233	11.5%	304.4	15.0%	304.4	15.0%
52	2,058	238	11.6%	308.7	15.0%	308.7	15.0%
53	2,025	296	14.6%	303.8	15.0%	303.8	15.0%
54	2,019	295	14.6%	302.9	15.0%	302.9	15.0%
55	2,152	280	13.0%	322.9	15.0%	322.9	15.0%
56	2,075	381	18.4%	311.2	15.0%	311.2	15.0%
57	1,714	405	23.7%	257.0	15.0%	257.0	15.0%
58	1,358	122	9.0%	203.8	15.0%	203.8	15.0%
59	1,348	260	19.3%	202.3	15.0%	202.3	15.0%
60	1,357	194	14.3%	203.5	15.0%	203.5	15.0%
61	1,169	263	22.5%	175.3	15.0%	175.3	15.0%
62	1,274	325	25.5%	382.3	30.0%	382.3	30.0%
63	981	123	12.5%	294.3	30.0%	294.3	30.0%
64	766	140	18.3%	229.9	30.0%	229.9	30.0%
65	602	237	39.4%	602.0	100.0%	602.0	100.0%
	25,188	4,324	17.2%	4,788.4	19.0%	4,788.4	19.0%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-21

Retirement Rates

Protection Occupations

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	659	129	19.6%	164.8	25.0%	164.8	25.0%
56	560	68	12.1%	56.0	10.0%	56.0	10.0%
57	511	48	9.4%	51.1	10.0%	51.1	10.0%
58	470	53	11.3%	47.0	10.0%	47.0	10.0%
59	438	38	8.7%	43.8	10.0%	43.8	10.0%
60	405	49	12.1%	40.5	10.0%	40.5	10.0%
61	339	55	16.2%	50.9	15.0%	50.9	15.0%
62	297	68	22.9%	89.1	30.0%	89.1	30.0%
63	233	35	15.0%	58.3	25.0%	58.3	25.0%
64	193	41	21.2%	48.3	25.0%	48.3	25.0%
65	157	41	26.1%	157.0	100.0%	157.0	100.0%
	4,262	625	14.7%	806.6	18.9%	806.6	18.9%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary F-22

Retirement Rates

Protection Occupations (Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	7,652	2,194	28.7%	1,913.1	25.0%	1,913.1	25.0%
56	6,198	1,096	17.7%	619.8	10.0%	619.8	10.0%
57	5,789	849	14.7%	578.9	10.0%	578.9	10.0%
58	5,270	847	16.1%	527.0	10.0%	527.0	10.0%
59	4,736	571	12.1%	473.6	10.0%	473.6	10.0%
60	4,446	775	17.4%	444.6	10.0%	444.6	10.0%
61	3,809	855	22.4%	571.3	15.0%	571.3	15.0%
62	3,135	937	29.9%	940.6	30.0%	940.6	30.0%
63	2,364	438	18.5%	590.9	25.0%	590.9	25.0%
64	1,866	497	26.6%	466.5	25.0%	466.5	25.0%
65	1,523	518	34.0%	1,522.6	100.0%	1,522.6	100.0%
	46,788	9,577	20.5%	8,648.9	18.5%	8,648.9	18.5%

APPENDIX G

DISABILITY

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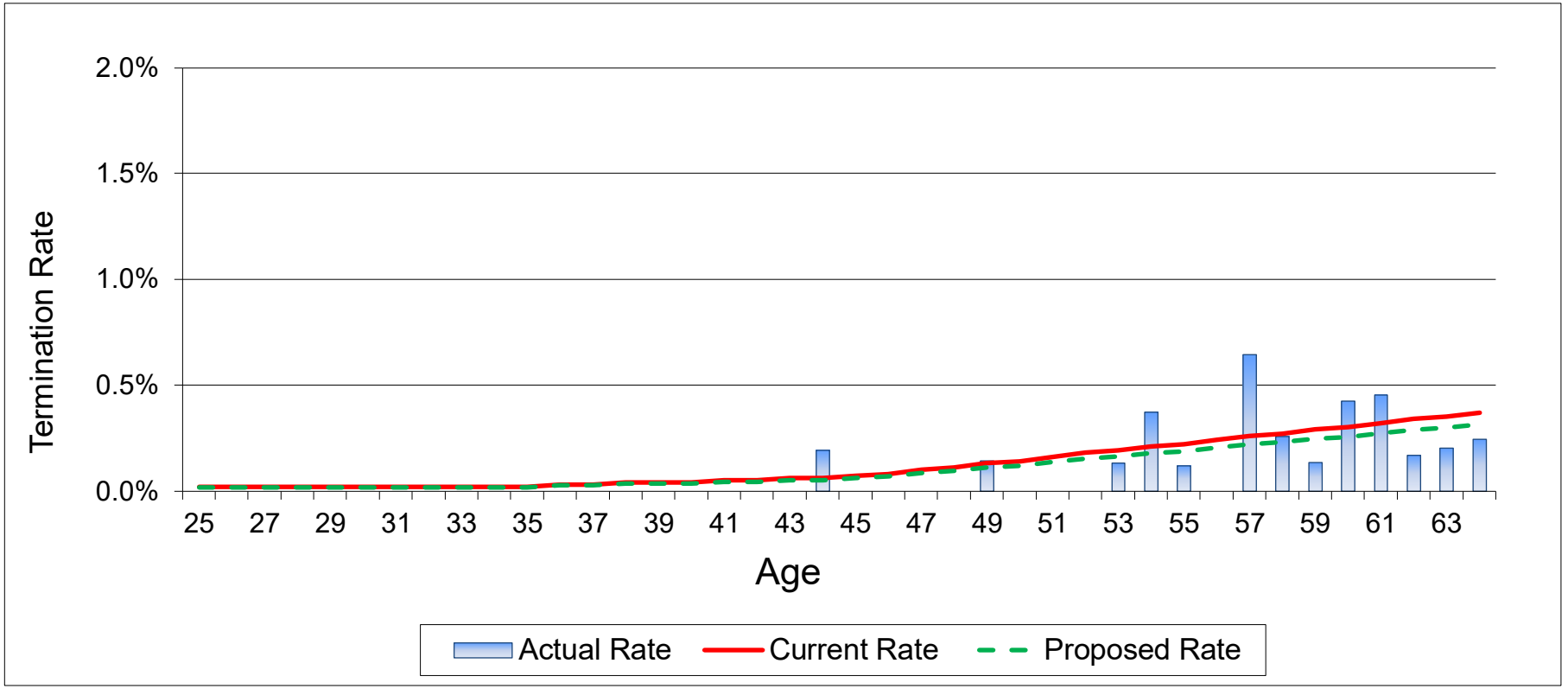
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit G-1

Rates of Disability

Males - State Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	24	31	26
Actual/Expected		77%	92%

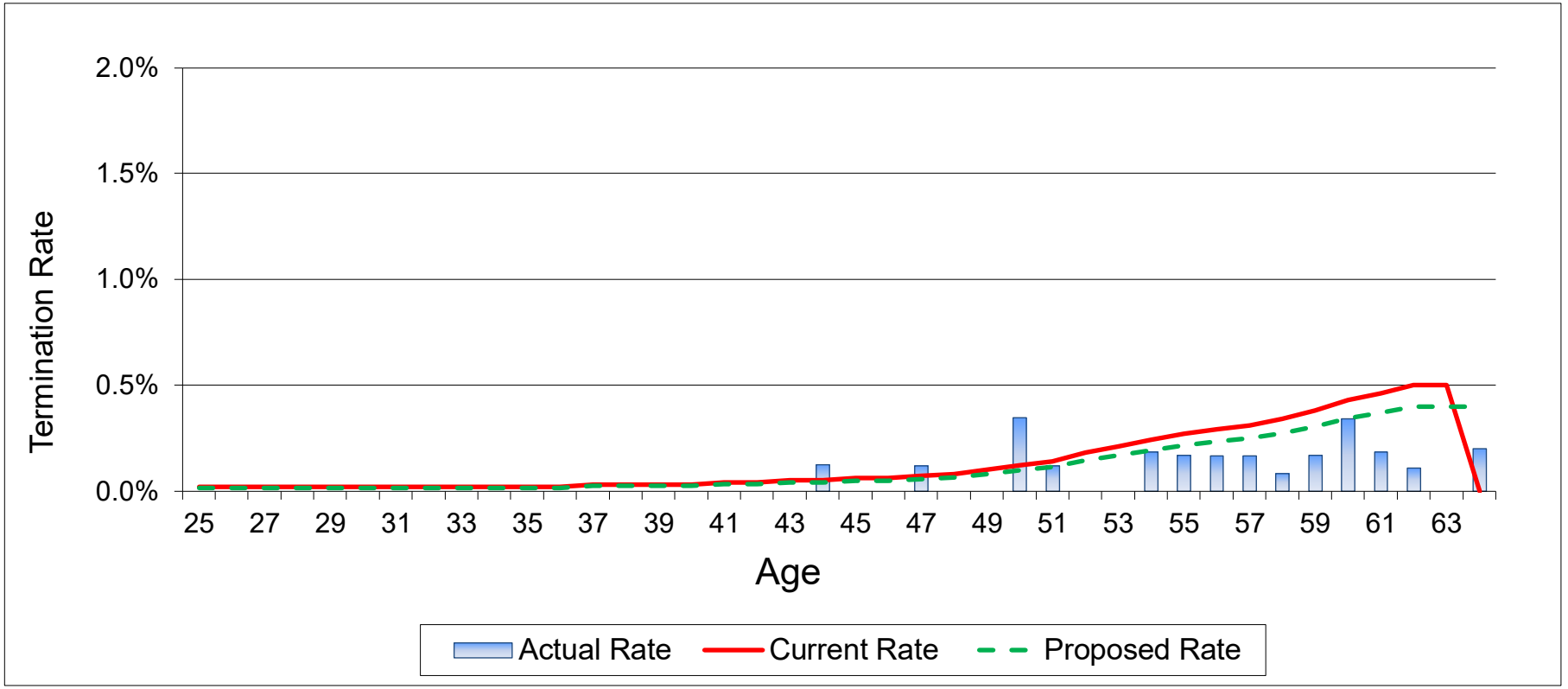
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit G-2

Rates of Disability

Females - State Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	25	51	43
Actual/Expected		49%	58%

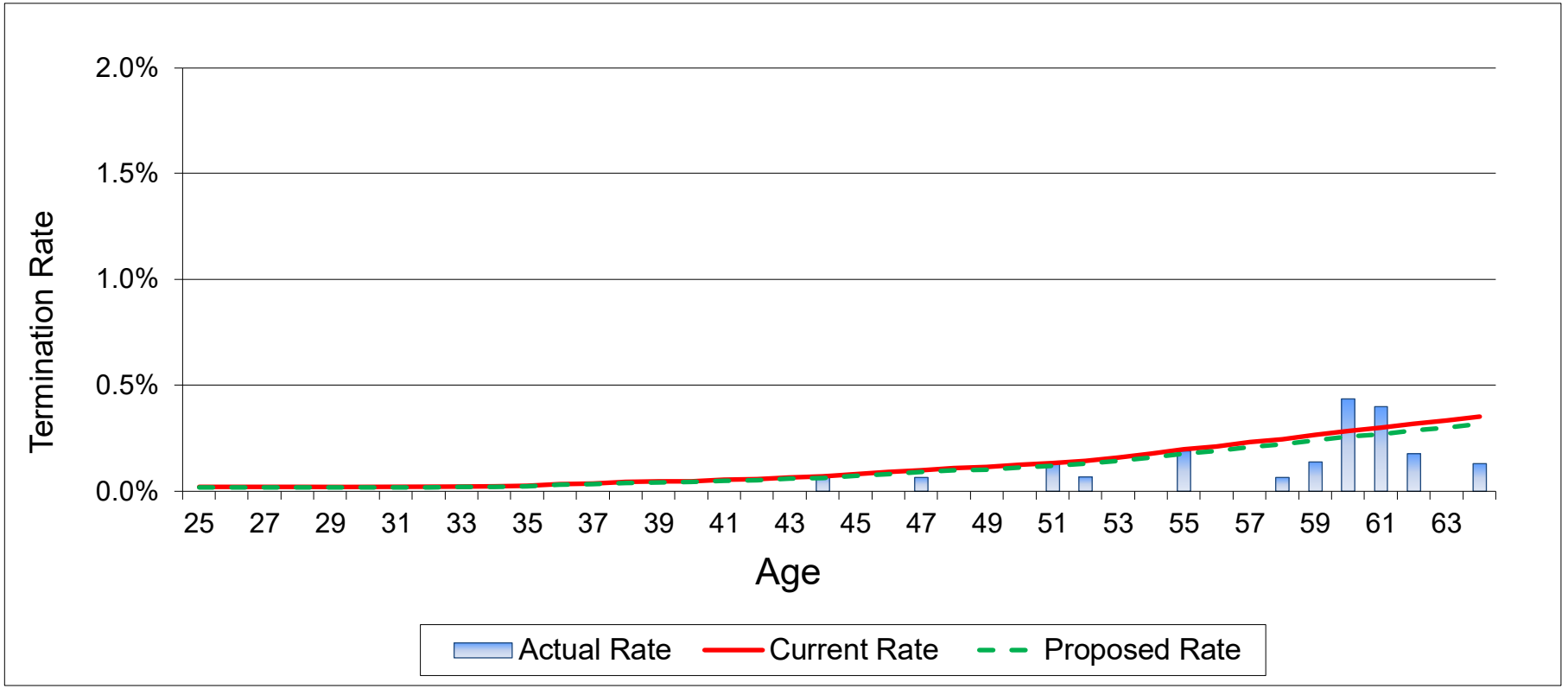
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit G-3

Rates of Disability

Males - School Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	25	61	55
Actual/Expected		41%	45%

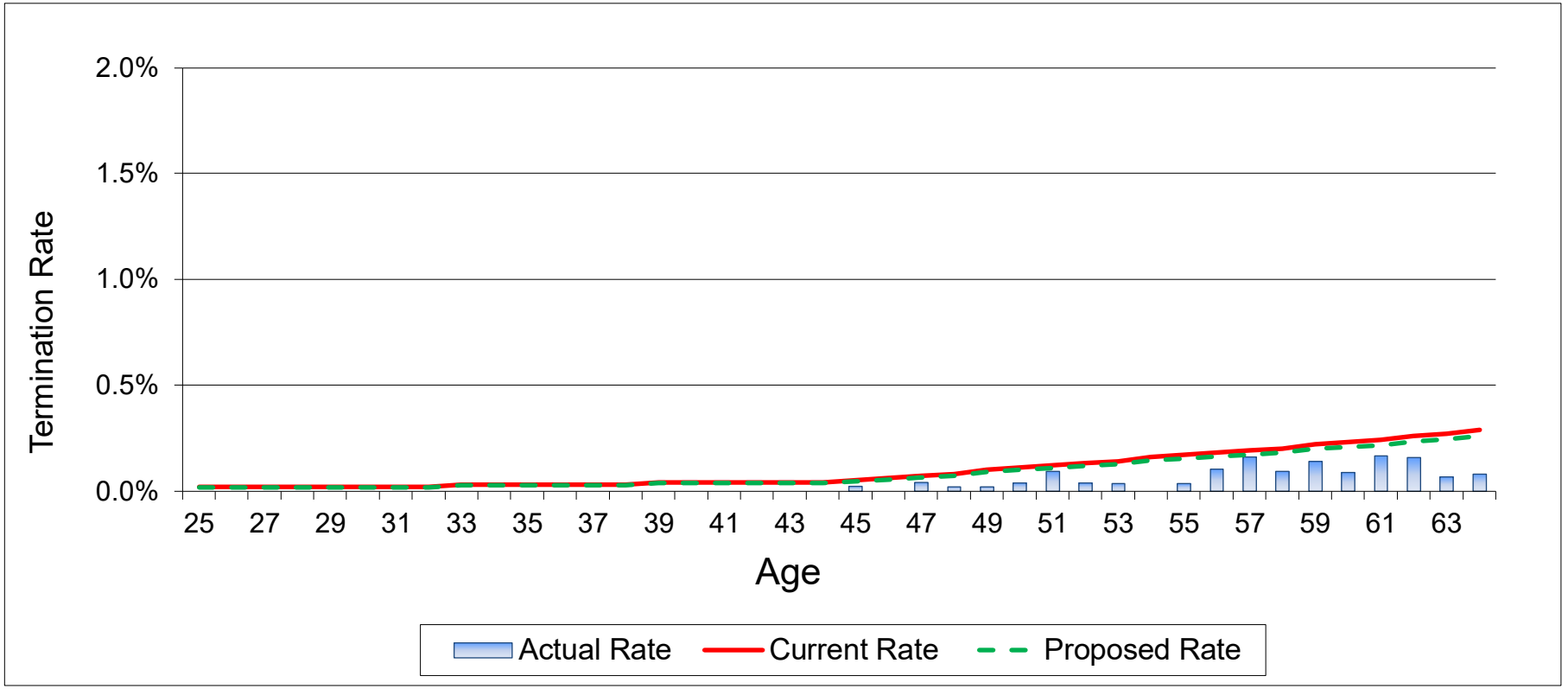
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit G-4

Rates of Disability

Females - School Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	66	170	153
Actual/Expected		39%	43%

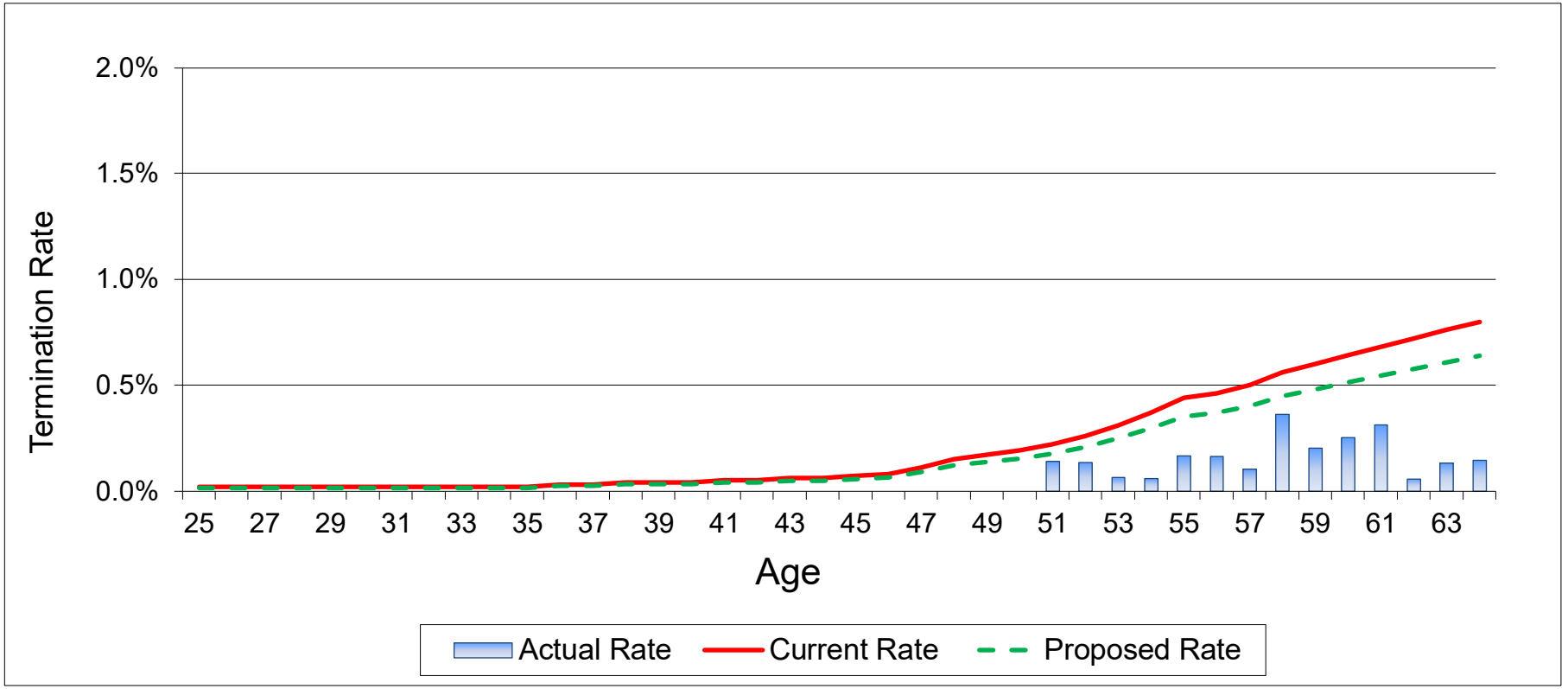
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit G-5

Rates of Disability

Males - Other Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	41	144	115
Actual/Expected		28%	36%

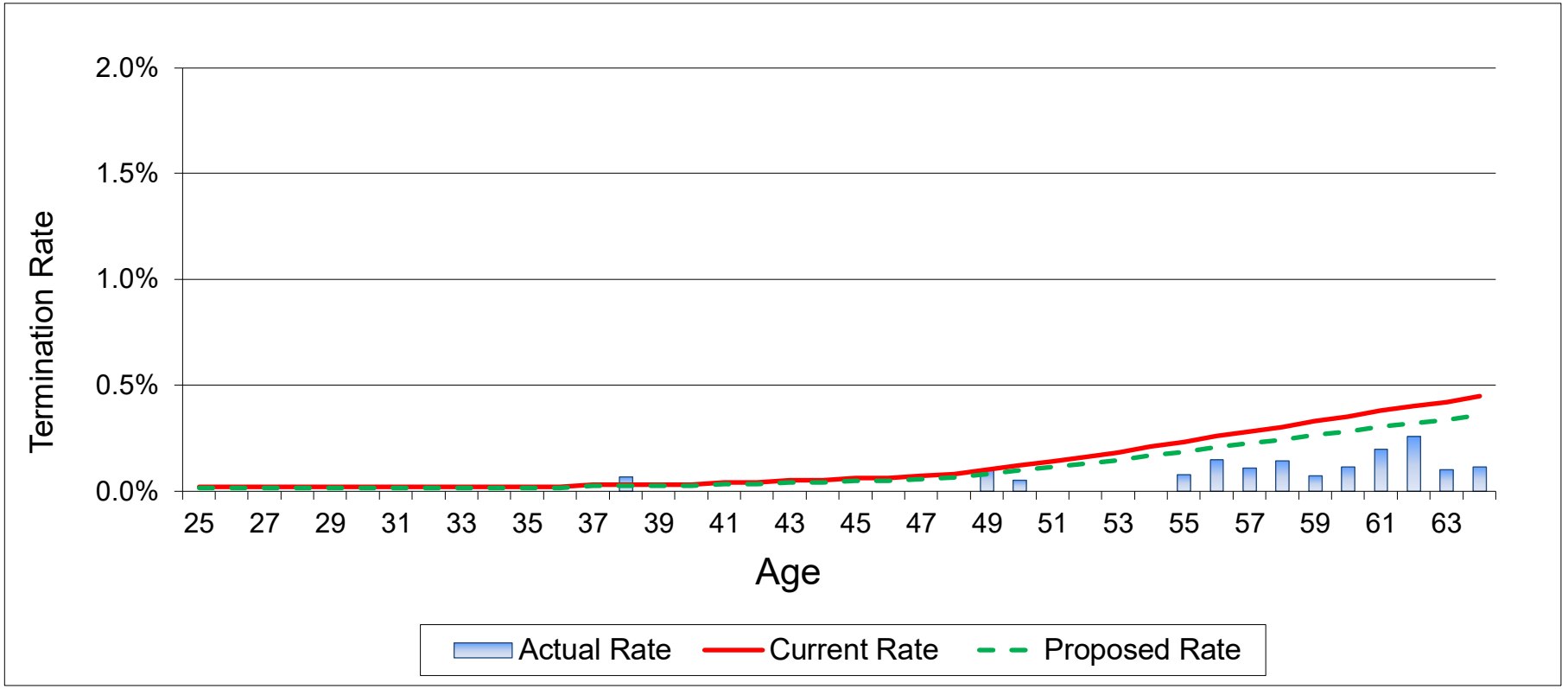
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit G-6

Rates of Disability

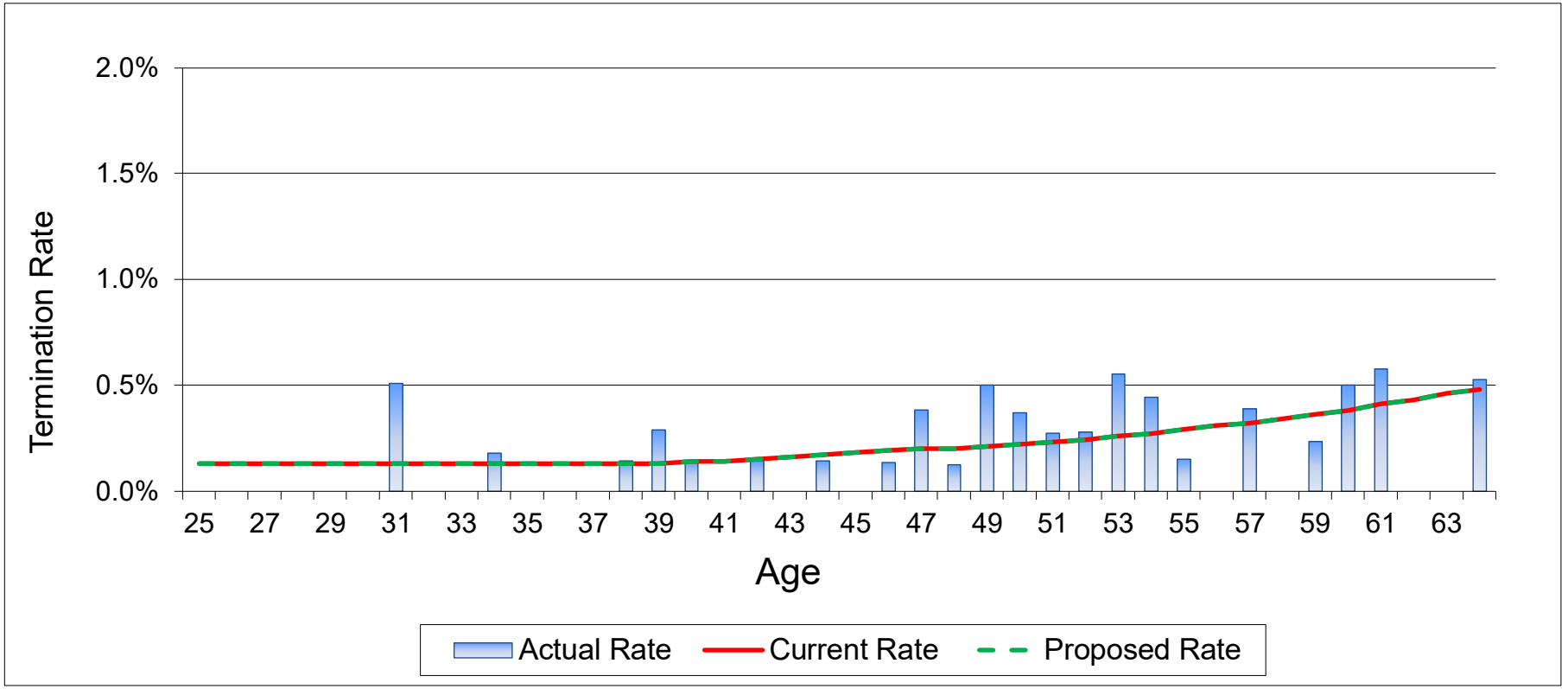
Females - Other Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	37	113	91
Actual/Expected		33%	41%

Iowa Public Employees' Retirement System

2017-2021 Experience Study
Exhibit G-7
Rates of Disability
Special Services



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	41	44	44
Actual/Expected		93%	93%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary G-1

Rates of Disability

Males - State Membership

Age	Exposure	Actual Disabilities	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
25	-	-	0.000%	-	0.020%	-	0.017%
26	6	-	0.000%	0.0	0.020%	0.0	0.017%
27	7	-	0.000%	0.0	0.020%	0.0	0.017%
28	27	-	0.000%	0.0	0.020%	0.0	0.017%
29	43	-	0.000%	0.0	0.020%	0.0	0.017%
30	67	-	0.000%	0.0	0.020%	0.0	0.017%
31	104	-	0.000%	0.0	0.020%	0.0	0.017%
32	147	-	0.000%	0.0	0.020%	0.0	0.017%
33	193	-	0.000%	0.0	0.020%	0.0	0.017%
34	225	-	0.000%	0.0	0.020%	0.0	0.017%
35	260	-	0.000%	0.1	0.020%	0.0	0.017%
36	305	-	0.000%	0.1	0.030%	0.1	0.026%
37	353	-	0.000%	0.1	0.030%	0.1	0.026%
38	389	-	0.000%	0.2	0.040%	0.1	0.034%
39	407	-	0.000%	0.2	0.040%	0.1	0.034%
40	442	-	0.000%	0.2	0.040%	0.2	0.034%
41	468	-	0.000%	0.2	0.050%	0.2	0.043%
42	474	-	0.000%	0.2	0.050%	0.2	0.043%
43	478	-	0.000%	0.3	0.060%	0.2	0.051%
44	518	1	0.193%	0.3	0.060%	0.3	0.051%
45	525	-	0.000%	0.4	0.070%	0.3	0.060%
46	586	-	0.000%	0.5	0.080%	0.4	0.068%
47	651	-	0.000%	0.7	0.100%	0.6	0.085%
48	686	-	0.000%	0.8	0.110%	0.6	0.094%
49	704	1	0.142%	0.9	0.130%	0.8	0.111%
50	690	-	0.000%	1.0	0.140%	0.8	0.119%
51	686	-	0.000%	1.1	0.160%	0.9	0.136%
52	670	-	0.000%	1.2	0.180%	1.0	0.153%
53	754	1	0.133%	1.4	0.190%	1.2	0.162%
54	804	3	0.373%	1.7	0.210%	1.4	0.179%
55	834	1	0.120%	1.8	0.220%	1.6	0.187%
56	820	-	0.000%	2.0	0.240%	1.7	0.204%
57	776	5	0.644%	2.0	0.260%	1.7	0.221%
58	772	2	0.259%	2.1	0.270%	1.8	0.230%
59	744	1	0.134%	2.2	0.290%	1.8	0.247%
60	705	3	0.426%	2.1	0.300%	1.8	0.255%
61	659	3	0.455%	2.1	0.320%	1.8	0.272%
62	591	1	0.169%	2.0	0.340%	1.7	0.289%
63	491	1	0.204%	1.7	0.350%	1.5	0.298%
64	409	1	0.244%	1.5	0.370%	1.3	0.315%
	18,470	24	0.130%	31.1	0.168%	26.4	0.143%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary G-2

Rates of Disability

Females - State Membership

Age	Exposure	Actual Disabilities	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
25	2	-	0.000%	0.0	0.020%	0.0	0.016%
26	9	-	0.000%	0.0	0.020%	0.0	0.016%
27	19	-	0.000%	0.0	0.020%	0.0	0.016%
28	35	-	0.000%	0.0	0.020%	0.0	0.016%
29	68	-	0.000%	0.0	0.020%	0.0	0.016%
30	110	-	0.000%	0.0	0.020%	0.0	0.016%
31	166	-	0.000%	0.0	0.020%	0.0	0.016%
32	257	-	0.000%	0.1	0.020%	0.0	0.016%
33	302	-	0.000%	0.1	0.020%	0.0	0.016%
34	368	-	0.000%	0.1	0.020%	0.1	0.016%
35	452	-	0.000%	0.1	0.020%	0.1	0.016%
36	486	-	0.000%	0.1	0.020%	0.1	0.016%
37	554	-	0.000%	0.2	0.030%	0.1	0.024%
38	632	-	0.000%	0.2	0.030%	0.2	0.024%
39	668	-	0.000%	0.2	0.030%	0.2	0.024%
40	676	-	0.000%	0.2	0.030%	0.2	0.024%
41	732	-	0.000%	0.3	0.040%	0.2	0.032%
42	767	-	0.000%	0.3	0.040%	0.2	0.032%
43	777	-	0.000%	0.4	0.050%	0.3	0.040%
44	798	1	0.125%	0.4	0.050%	0.3	0.040%
45	778	-	0.000%	0.5	0.060%	0.4	0.048%
46	803	-	0.000%	0.5	0.060%	0.4	0.048%
47	835	1	0.120%	0.6	0.070%	0.5	0.056%
48	855	-	0.000%	0.7	0.080%	0.5	0.064%
49	873	-	0.000%	0.9	0.100%	0.7	0.080%
50	865	3	0.347%	1.0	0.120%	0.8	0.096%
51	847	1	0.118%	1.2	0.140%	0.9	0.112%
52	926	-	0.000%	1.7	0.180%	1.3	0.144%
53	1,024	-	0.000%	2.2	0.210%	1.7	0.168%
54	1,089	2	0.184%	2.6	0.240%	2.1	0.192%
55	1,188	2	0.168%	3.2	0.270%	2.6	0.216%
56	1,199	2	0.167%	3.5	0.290%	2.8	0.232%
57	1,194	2	0.168%	3.7	0.310%	3.0	0.248%
58	1,205	1	0.083%	4.1	0.340%	3.3	0.272%
59	1,175	2	0.170%	4.5	0.380%	3.6	0.304%
60	1,168	4	0.342%	5.0	0.430%	4.0	0.344%
61	1,088	2	0.184%	5.0	0.460%	4.0	0.368%
62	928	1	0.108%	4.6	0.500%	3.7	0.400%
63	698	-	0.000%	3.5	0.500%	2.8	0.400%
64	499	1	0.200%	-	0.000%	2.0	0.400%
	27,115	25	0.092%	51.5	0.190%	43.2	0.159%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary G-3

Rates of Disability

Males - School Membership

Age	Exposure	Actual Disabilities	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
25	10	-	0.000%	0.0	0.020%	0.0	0.018%
26	29	-	0.000%	0.0	0.020%	0.0	0.018%
27	53	-	0.000%	0.0	0.020%	0.0	0.018%
28	96	-	0.000%	0.0	0.020%	0.0	0.018%
29	249	-	0.000%	0.0	0.020%	0.0	0.018%
30	552	-	0.000%	0.1	0.020%	0.1	0.018%
31	760	-	0.000%	0.2	0.020%	0.1	0.018%
32	933	-	0.000%	0.2	0.020%	0.2	0.018%
33	981	-	0.000%	0.2	0.021%	0.2	0.019%
34	1,085	-	0.000%	0.2	0.022%	0.2	0.020%
35	1,231	-	0.000%	0.3	0.024%	0.3	0.022%
36	1,273	-	0.000%	0.4	0.032%	0.4	0.029%
37	1,340	-	0.000%	0.5	0.034%	0.4	0.031%
38	1,370	-	0.000%	0.6	0.042%	0.5	0.038%
39	1,396	-	0.000%	0.6	0.044%	0.6	0.040%
40	1,421	-	0.000%	0.7	0.046%	0.6	0.041%
41	1,455	-	0.000%	0.8	0.054%	0.7	0.049%
42	1,418	-	0.000%	0.8	0.056%	0.7	0.050%
43	1,385	-	0.000%	0.9	0.064%	0.8	0.058%
44	1,366	1	0.073%	0.9	0.068%	0.8	0.061%
45	1,372	-	0.000%	1.1	0.078%	1.0	0.070%
46	1,450	-	0.000%	1.3	0.088%	1.1	0.079%
47	1,533	1	0.065%	1.5	0.098%	1.4	0.088%
48	1,562	-	0.000%	1.7	0.108%	1.5	0.097%
49	1,616	-	0.000%	1.8	0.112%	1.6	0.101%
50	1,582	-	0.000%	1.9	0.122%	1.7	0.110%
51	1,521	2	0.131%	2.0	0.132%	1.8	0.119%
52	1,469	1	0.068%	2.1	0.142%	1.9	0.128%
53	1,495	-	0.000%	2.3	0.156%	2.1	0.140%
54	1,553	-	0.000%	2.7	0.176%	2.5	0.158%
55	1,585	3	0.189%	3.1	0.196%	2.8	0.176%
56	1,644	-	0.000%	3.5	0.210%	3.1	0.189%
57	1,584	-	0.000%	3.6	0.230%	3.3	0.207%
58	1,542	1	0.065%	3.8	0.244%	3.4	0.220%
59	1,440	2	0.139%	3.8	0.264%	3.4	0.238%
60	1,378	6	0.435%	3.9	0.284%	3.5	0.256%
61	1,254	5	0.399%	3.7	0.298%	3.4	0.268%
62	1,129	2	0.177%	3.6	0.318%	3.2	0.286%
63	925	-	0.000%	3.1	0.332%	2.8	0.299%
64	777	1	0.129%	2.7	0.352%	2.5	0.317%
	46,814	25	0.053%	60.6	0.129%	54.6	0.117%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary G-4

Rates of Disability

Females - School Membership

Age	Exposure	Actual Disabilities	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
25	20	-	0.000%	0.0	0.020%	0.0	0.018%
26	60	-	0.000%	0.0	0.020%	0.0	0.018%
27	134	-	0.000%	0.0	0.020%	0.0	0.018%
28	283	-	0.000%	0.1	0.020%	0.1	0.018%
29	1,003	-	0.000%	0.2	0.020%	0.2	0.018%
30	1,954	-	0.000%	0.4	0.020%	0.4	0.018%
31	2,595	-	0.000%	0.5	0.020%	0.5	0.018%
32	2,913	-	0.000%	0.6	0.020%	0.5	0.018%
33	3,057	-	0.000%	0.9	0.030%	0.8	0.027%
34	3,270	-	0.000%	1.0	0.030%	0.9	0.027%
35	3,453	-	0.000%	1.0	0.030%	0.9	0.027%
36	3,660	-	0.000%	1.1	0.030%	1.0	0.027%
37	3,897	-	0.000%	1.2	0.030%	1.1	0.027%
38	4,075	-	0.000%	1.2	0.030%	1.1	0.027%
39	4,175	-	0.000%	1.7	0.040%	1.5	0.036%
40	4,284	-	0.000%	1.7	0.040%	1.5	0.036%
41	4,255	-	0.000%	1.7	0.040%	1.5	0.036%
42	4,186	-	0.000%	1.7	0.040%	1.5	0.036%
43	4,235	-	0.000%	1.7	0.040%	1.5	0.036%
44	4,183	-	0.000%	1.7	0.040%	1.5	0.036%
45	4,398	1	0.023%	2.2	0.050%	2.0	0.045%
46	4,653	-	0.000%	2.8	0.060%	2.5	0.054%
47	4,929	2	0.041%	3.5	0.070%	3.1	0.063%
48	5,176	1	0.019%	4.1	0.080%	3.7	0.072%
49	5,318	1	0.019%	5.3	0.100%	4.8	0.090%
50	5,362	2	0.037%	5.9	0.110%	5.3	0.099%
51	5,314	5	0.094%	6.4	0.120%	5.7	0.108%
52	5,368	2	0.037%	7.0	0.130%	6.3	0.117%
53	5,459	2	0.037%	7.6	0.140%	6.9	0.126%
54	5,505	-	0.000%	8.8	0.160%	7.9	0.144%
55	5,695	2	0.035%	9.7	0.170%	8.7	0.153%
56	5,794	6	0.104%	10.4	0.180%	9.4	0.162%
57	5,629	9	0.160%	10.7	0.190%	9.6	0.171%
58	5,391	5	0.093%	10.8	0.200%	9.7	0.180%
59	5,011	7	0.140%	11.0	0.220%	9.9	0.198%
60	4,577	4	0.087%	10.5	0.230%	9.5	0.207%
61	4,214	7	0.166%	10.1	0.240%	9.1	0.216%
62	3,788	6	0.158%	9.8	0.260%	8.9	0.234%
63	3,024	2	0.066%	8.2	0.270%	7.3	0.243%
64	2,459	2	0.081%	7.1	0.290%	6.4	0.261%
	152,756	66	0.043%	170.3	0.112%	153.3	0.100%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary G-5

Rates of Disability

Males - Other Membership

Age	Exposure	Actual Disabilities	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
25	7	-	0.000%	0.0	0.020%	0.0	0.016%
26	33	-	0.000%	0.0	0.020%	0.0	0.016%
27	79	-	0.000%	0.0	0.020%	0.0	0.016%
28	138	-	0.000%	0.0	0.020%	0.0	0.016%
29	219	-	0.000%	0.0	0.020%	0.0	0.016%
30	295	-	0.000%	0.1	0.020%	0.0	0.016%
31	389	-	0.000%	0.1	0.020%	0.1	0.016%
32	475	-	0.000%	0.1	0.020%	0.1	0.016%
33	576	-	0.000%	0.1	0.020%	0.1	0.016%
34	687	-	0.000%	0.1	0.020%	0.1	0.016%
35	725	-	0.000%	0.1	0.020%	0.1	0.016%
36	829	-	0.000%	0.2	0.030%	0.2	0.024%
37	911	-	0.000%	0.3	0.030%	0.2	0.024%
38	1,049	-	0.000%	0.4	0.040%	0.3	0.032%
39	1,128	-	0.000%	0.5	0.040%	0.4	0.032%
40	1,200	-	0.000%	0.5	0.040%	0.4	0.032%
41	1,173	-	0.000%	0.6	0.050%	0.5	0.040%
42	1,126	-	0.000%	0.6	0.050%	0.5	0.040%
43	1,154	-	0.000%	0.7	0.060%	0.6	0.048%
44	1,149	-	0.000%	0.7	0.060%	0.6	0.048%
45	1,219	-	0.000%	0.9	0.070%	0.7	0.056%
46	1,293	-	0.000%	1.0	0.080%	0.8	0.064%
47	1,328	-	0.000%	1.5	0.110%	1.2	0.088%
48	1,422	-	0.000%	2.1	0.150%	1.7	0.120%
49	1,451	-	0.000%	2.5	0.170%	2.0	0.136%
50	1,425	-	0.000%	2.7	0.190%	2.2	0.152%
51	1,425	2	0.140%	3.1	0.220%	2.5	0.176%
52	1,489	2	0.134%	3.9	0.260%	3.1	0.208%
53	1,577	1	0.063%	4.9	0.310%	3.9	0.248%
54	1,681	1	0.059%	6.2	0.370%	5.0	0.296%
55	1,806	3	0.166%	7.9	0.440%	6.4	0.352%
56	1,837	3	0.163%	8.5	0.460%	6.8	0.368%
57	1,913	2	0.105%	9.6	0.500%	7.7	0.400%
58	1,937	7	0.361%	10.8	0.560%	8.7	0.448%
59	1,971	4	0.203%	11.8	0.600%	9.5	0.480%
60	1,972	5	0.254%	12.6	0.640%	10.1	0.512%
61	1,914	6	0.313%	13.0	0.680%	10.4	0.544%
62	1,807	1	0.055%	13.0	0.720%	10.4	0.576%
63	1,504	2	0.133%	11.4	0.760%	9.1	0.608%
64	1,369	2	0.146%	11.0	0.800%	8.8	0.640%
	45,682	41	0.090%	143.6	0.314%	114.9	0.251%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary G-6

Rates of Disability

Females - Other Membership

Age	Exposure	Actual Disabilities	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
25	38	-	0.000%	0.0	0.020%	0.0	0.016%
26	113	-	0.000%	0.0	0.020%	0.0	0.016%
27	188	-	0.000%	0.0	0.020%	0.0	0.016%
28	317	-	0.000%	0.1	0.020%	0.1	0.016%
29	523	-	0.000%	0.1	0.020%	0.1	0.016%
30	736	-	0.000%	0.1	0.020%	0.1	0.016%
31	893	-	0.000%	0.2	0.020%	0.1	0.016%
32	1,054	-	0.000%	0.2	0.020%	0.2	0.016%
33	1,183	-	0.000%	0.2	0.020%	0.2	0.016%
34	1,308	-	0.000%	0.3	0.020%	0.2	0.016%
35	1,374	-	0.000%	0.3	0.020%	0.2	0.016%
36	1,445	-	0.000%	0.3	0.020%	0.2	0.016%
37	1,443	-	0.000%	0.4	0.030%	0.3	0.024%
38	1,505	1	0.066%	0.5	0.030%	0.4	0.024%
39	1,561	-	0.000%	0.5	0.030%	0.4	0.024%
40	1,587	-	0.000%	0.5	0.030%	0.4	0.024%
41	1,587	-	0.000%	0.6	0.040%	0.5	0.032%
42	1,615	-	0.000%	0.6	0.040%	0.5	0.032%
43	1,624	-	0.000%	0.8	0.050%	0.6	0.040%
44	1,636	-	0.000%	0.8	0.050%	0.7	0.040%
45	1,701	-	0.000%	1.0	0.060%	0.8	0.048%
46	1,760	-	0.000%	1.1	0.060%	0.8	0.048%
47	1,825	-	0.000%	1.3	0.070%	1.0	0.056%
48	1,883	-	0.000%	1.5	0.080%	1.2	0.064%
49	1,959	2	0.102%	2.0	0.100%	1.6	0.080%
50	1,978	1	0.051%	2.4	0.120%	1.9	0.096%
51	1,980	-	0.000%	2.8	0.140%	2.2	0.112%
52	2,093	-	0.000%	3.3	0.160%	2.7	0.128%
53	2,195	-	0.000%	4.0	0.180%	3.2	0.144%
54	2,398	-	0.000%	5.0	0.210%	4.0	0.168%
55	2,589	2	0.077%	6.0	0.230%	4.8	0.184%
56	2,724	4	0.147%	7.1	0.260%	5.7	0.208%
57	2,770	3	0.108%	7.8	0.280%	6.2	0.224%
58	2,803	4	0.143%	8.4	0.300%	6.7	0.240%
59	2,764	2	0.072%	9.1	0.330%	7.3	0.264%
60	2,643	3	0.114%	9.3	0.350%	7.4	0.280%
61	2,522	5	0.198%	9.6	0.380%	7.7	0.304%
62	2,329	6	0.258%	9.3	0.400%	7.5	0.320%
63	1,974	2	0.101%	8.3	0.420%	6.6	0.336%
64	1,742	2	0.115%	7.8	0.450%	6.3	0.360%
	66,362	37	0.056%	113.5	0.171%	90.8	0.137%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary G-7

Rates of Disability

Special Services

Age	Exposure	Actual Disabilities	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
25	6	-	0.000%	0.0	0.130%	0.0	0.130%
26	29	-	0.000%	0.0	0.130%	0.0	0.130%
27	54	-	0.000%	0.1	0.130%	0.1	0.130%
28	120	-	0.000%	0.2	0.130%	0.2	0.130%
29	198	-	0.000%	0.3	0.130%	0.3	0.130%
30	299	-	0.000%	0.4	0.130%	0.4	0.130%
31	393	2	0.509%	0.5	0.130%	0.5	0.130%
32	453	-	0.000%	0.6	0.130%	0.6	0.130%
33	496	-	0.000%	0.6	0.130%	0.6	0.130%
34	560	1	0.179%	0.7	0.130%	0.7	0.130%
35	627	-	0.000%	0.8	0.130%	0.8	0.130%
36	654	-	0.000%	0.9	0.130%	0.9	0.130%
37	660	-	0.000%	0.9	0.130%	0.9	0.130%
38	699	1	0.143%	0.9	0.130%	0.9	0.130%
39	692	2	0.289%	0.9	0.130%	0.9	0.130%
40	704	1	0.142%	1.0	0.140%	1.0	0.140%
41	717	-	0.000%	1.0	0.140%	1.0	0.140%
42	693	1	0.144%	1.0	0.150%	1.0	0.150%
43	713	-	0.000%	1.1	0.160%	1.1	0.160%
44	702	1	0.142%	1.2	0.170%	1.2	0.170%
45	701	-	0.000%	1.3	0.180%	1.3	0.180%
46	740	1	0.135%	1.4	0.190%	1.4	0.190%
47	780	3	0.385%	1.6	0.200%	1.6	0.200%
48	809	1	0.124%	1.6	0.200%	1.6	0.200%
49	800	4	0.500%	1.7	0.210%	1.7	0.210%
50	811	3	0.370%	1.8	0.220%	1.8	0.220%
51	728	2	0.275%	1.7	0.230%	1.7	0.230%
52	716	2	0.279%	1.7	0.240%	1.7	0.240%
53	724	4	0.552%	1.9	0.260%	1.9	0.260%
54	675	3	0.444%	1.8	0.270%	1.8	0.270%
55	669	1	0.149%	1.9	0.290%	1.9	0.290%
56	572	-	0.000%	1.8	0.310%	1.8	0.310%
57	516	2	0.388%	1.7	0.320%	1.7	0.320%
58	463	-	0.000%	1.6	0.340%	1.6	0.340%
59	429	1	0.233%	1.5	0.360%	1.5	0.360%
60	400	2	0.500%	1.5	0.380%	1.5	0.380%
61	346	2	0.578%	1.4	0.410%	1.4	0.410%
62	311	-	0.000%	1.3	0.430%	1.3	0.430%
63	239	-	0.000%	1.1	0.460%	1.1	0.460%
64	190	1	0.526%	0.9	0.480%	0.9	0.480%
	21,088	41	0.194%	44.3	0.210%	44.3	0.210%

APPENDIX H

TERMINATION OF EMPLOYMENT

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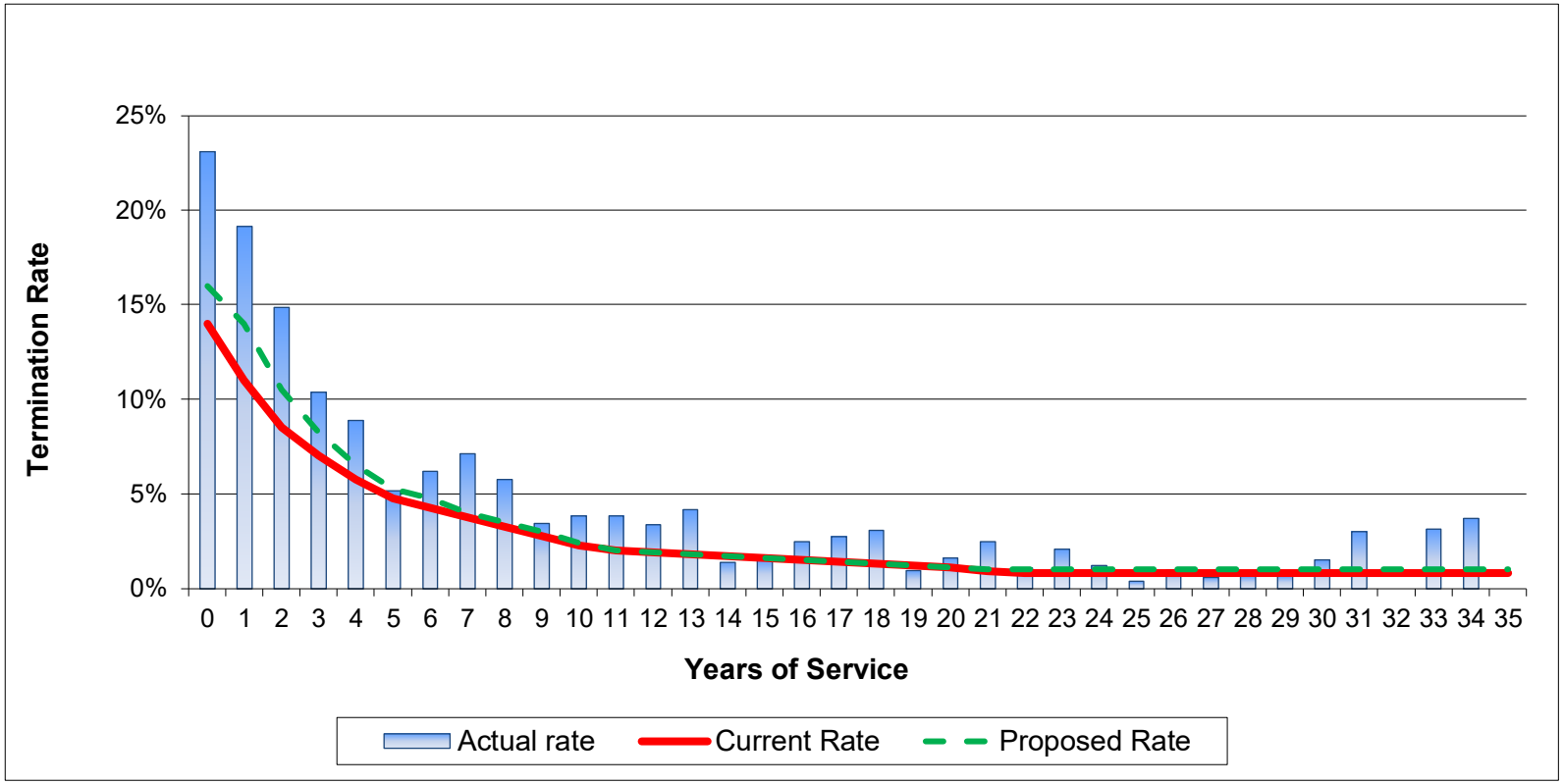
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-1

Termination of Employment

State Membership - Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,307	799	933
Actual/Expected		164%	140%

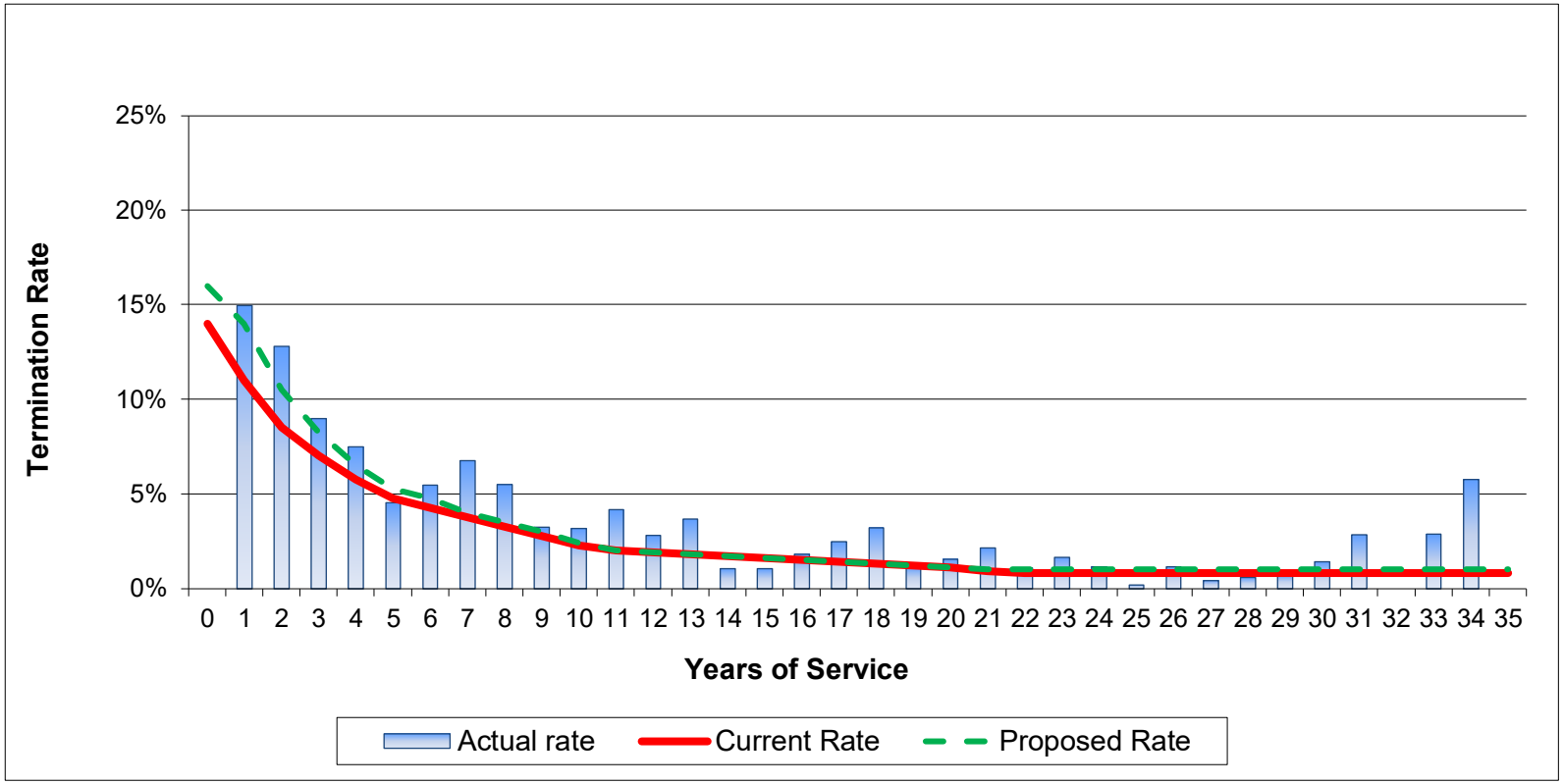
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-2

Termination of Employment

State Membership - Males (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	37,490	25,758	28,286
Actual/Expected		146%	133%

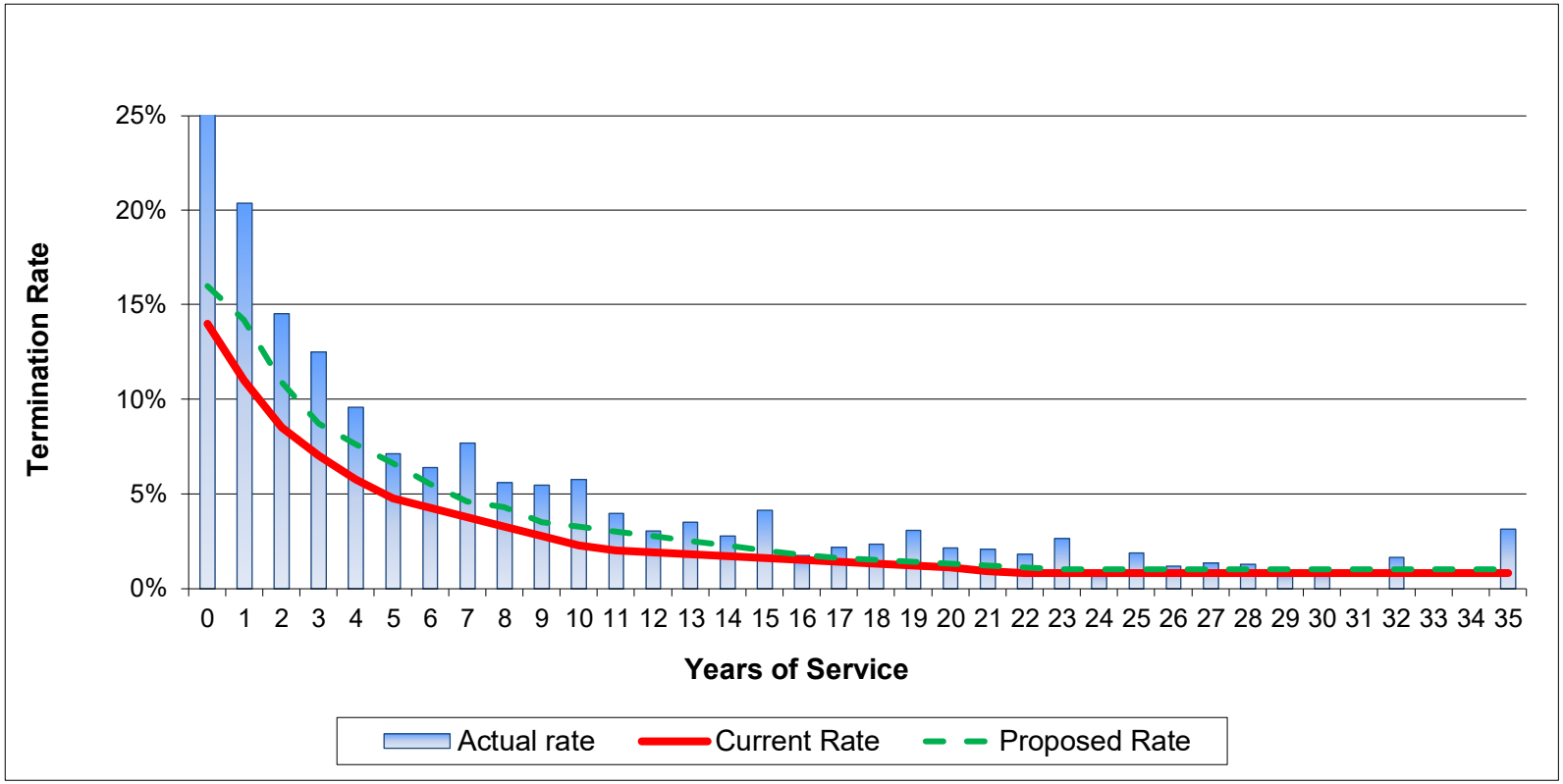
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-3

Termination of Employment

State Membership - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	2,013	1,110	1,427
Actual/Expected		181%	141%

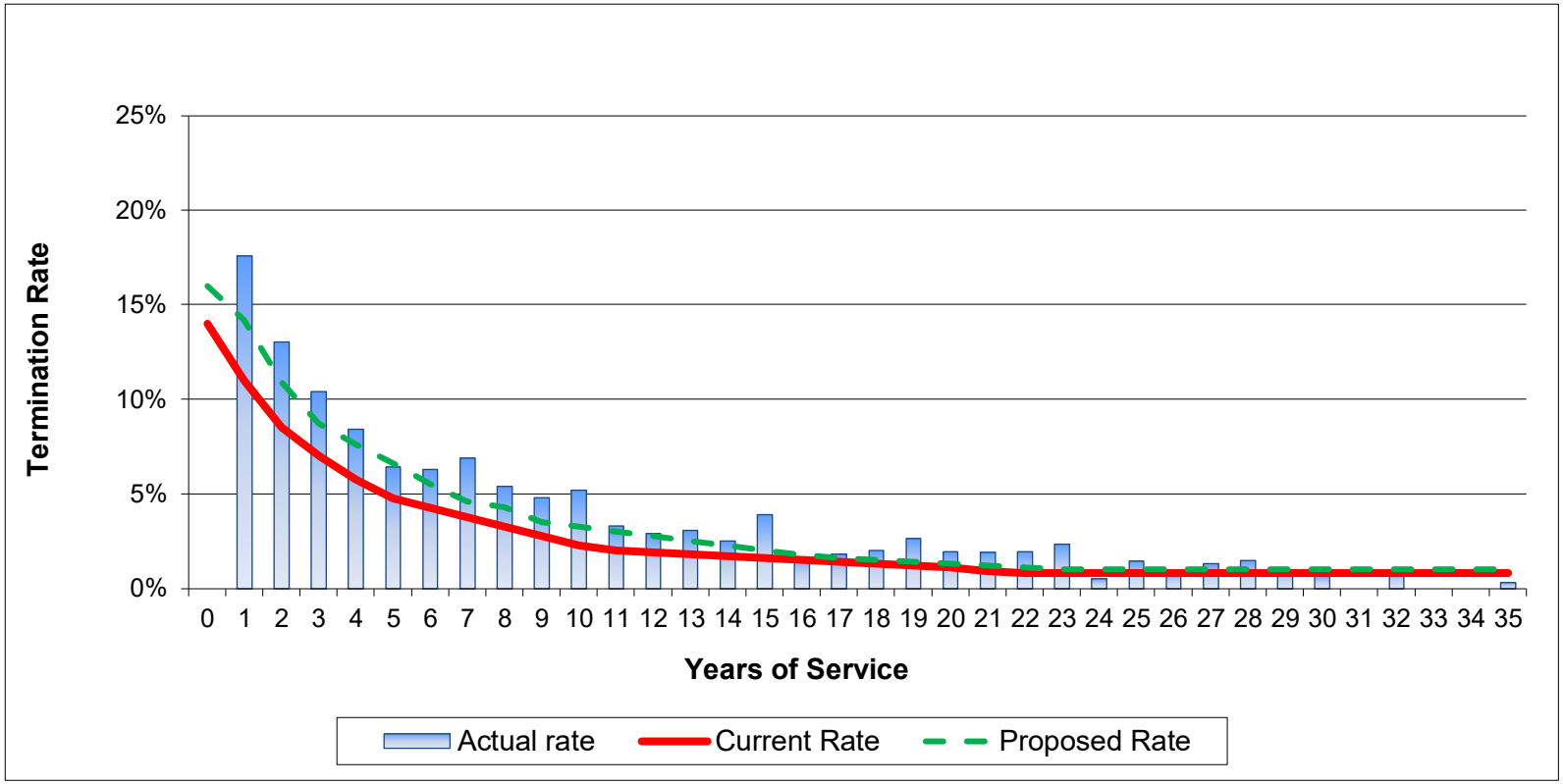
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-4

Termination of Employment

State Membership - Females (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	54,918	33,351	43,259
Actual/Expected		165%	127%

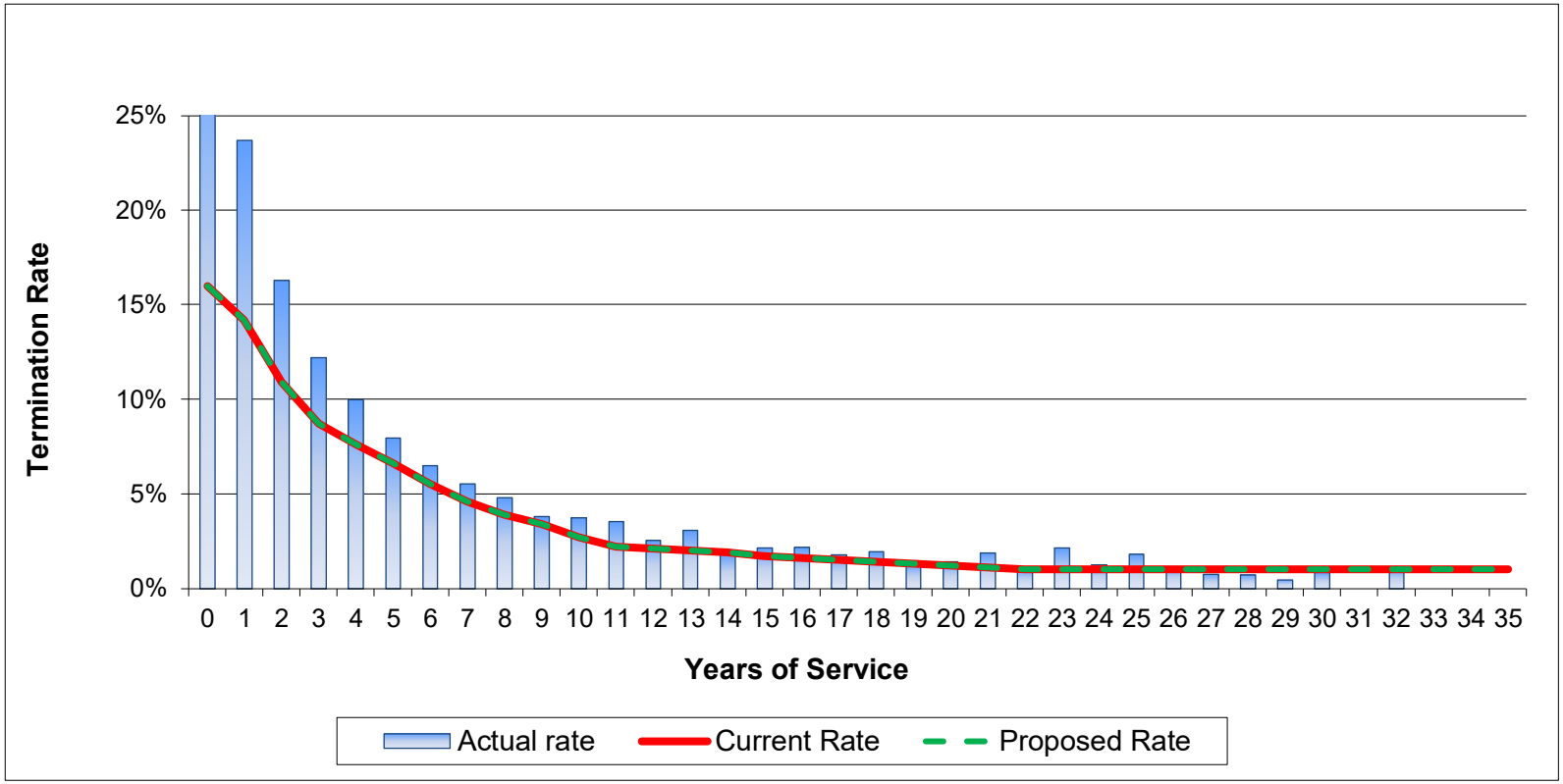
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-5

Termination of Employment

School Membership - Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	4,635	3,169	3,169
Actual/Expected		146%	146%

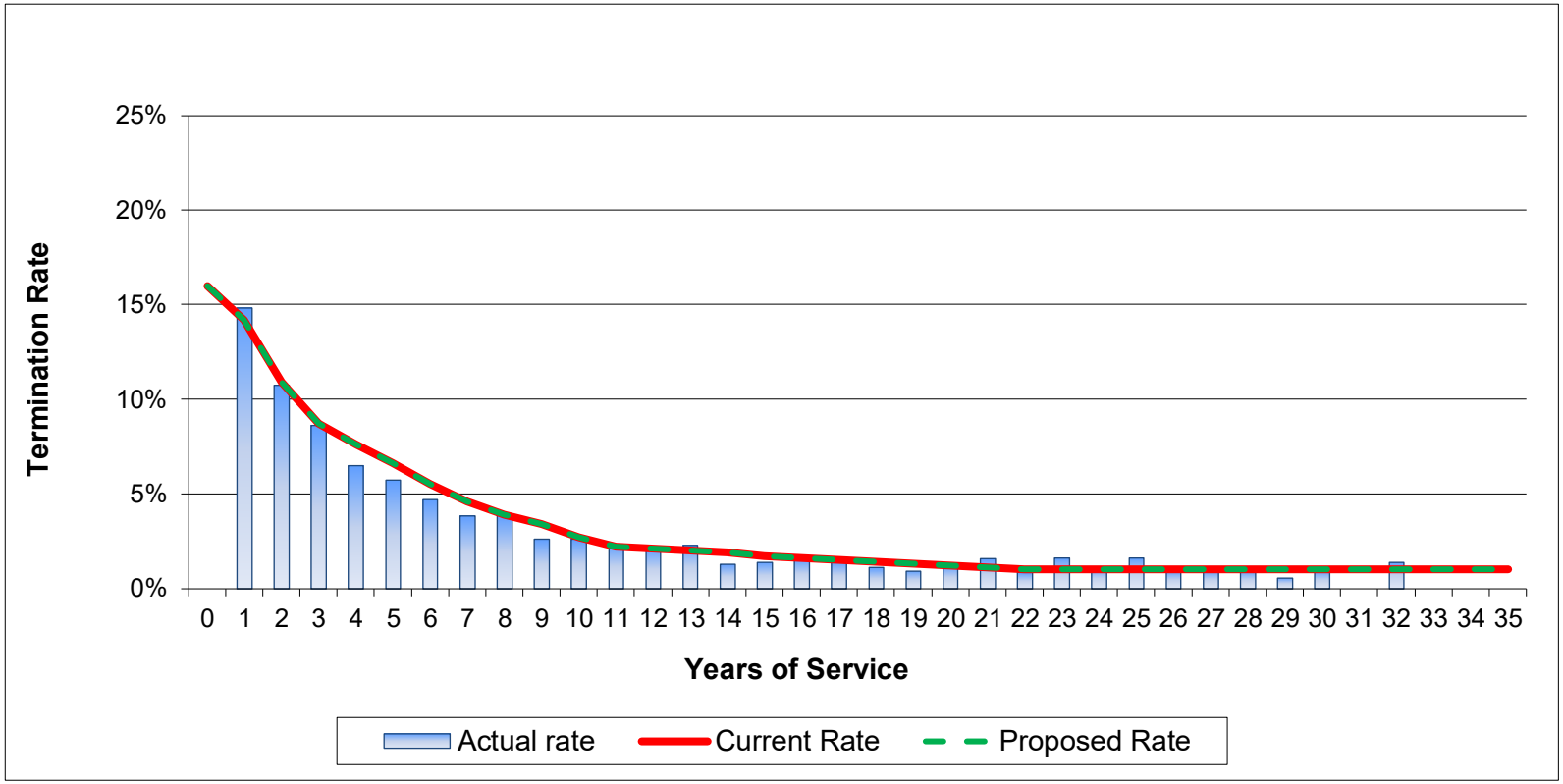
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-6

Termination of Employment

School Membership - Males (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	75,819	79,931	79,931
Actual/Expected		95%	95%

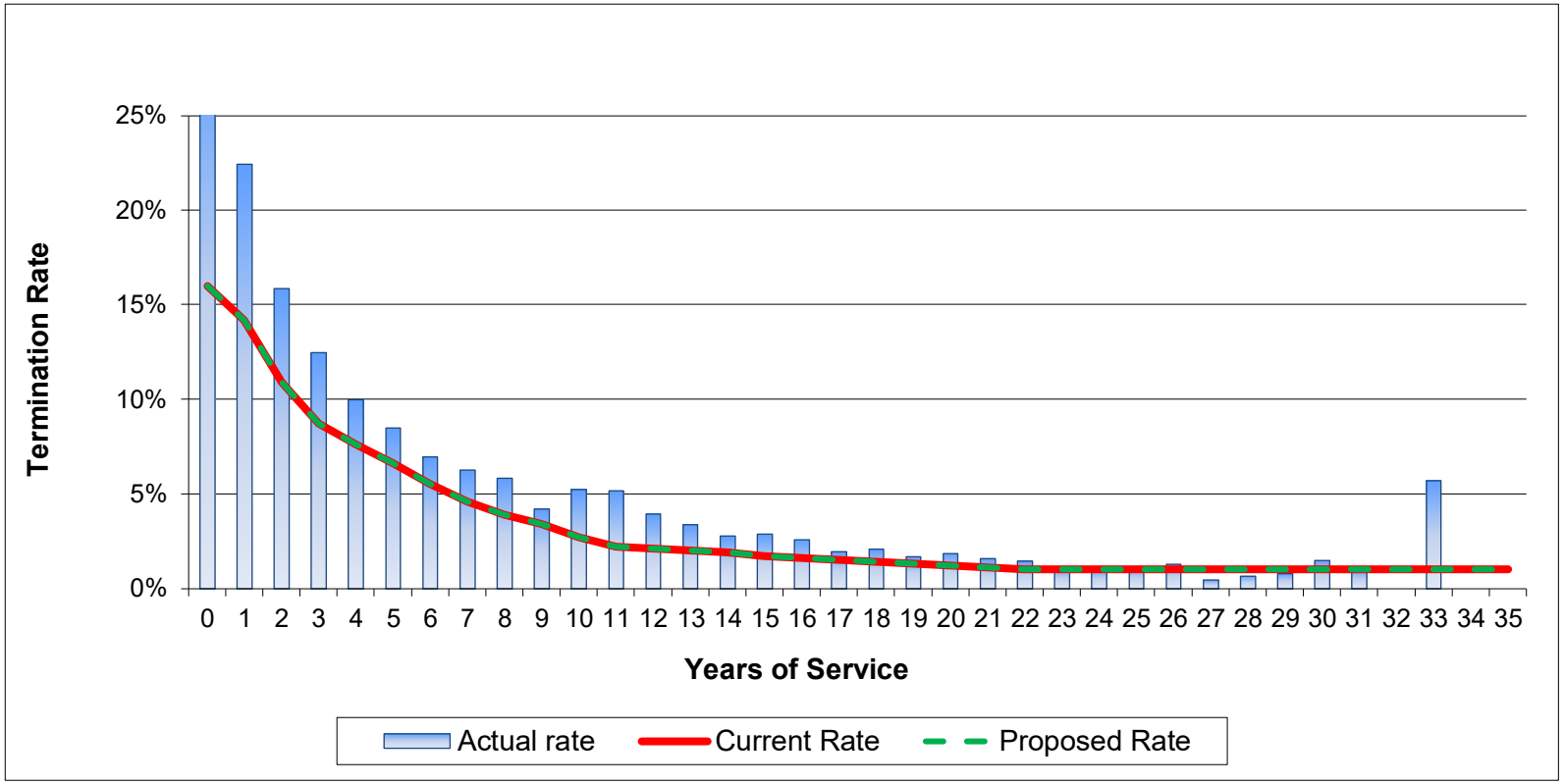
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-7

Termination of Employment

School Membership - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	16,557	11,139	11,139
Actual/Expected		149%	149%

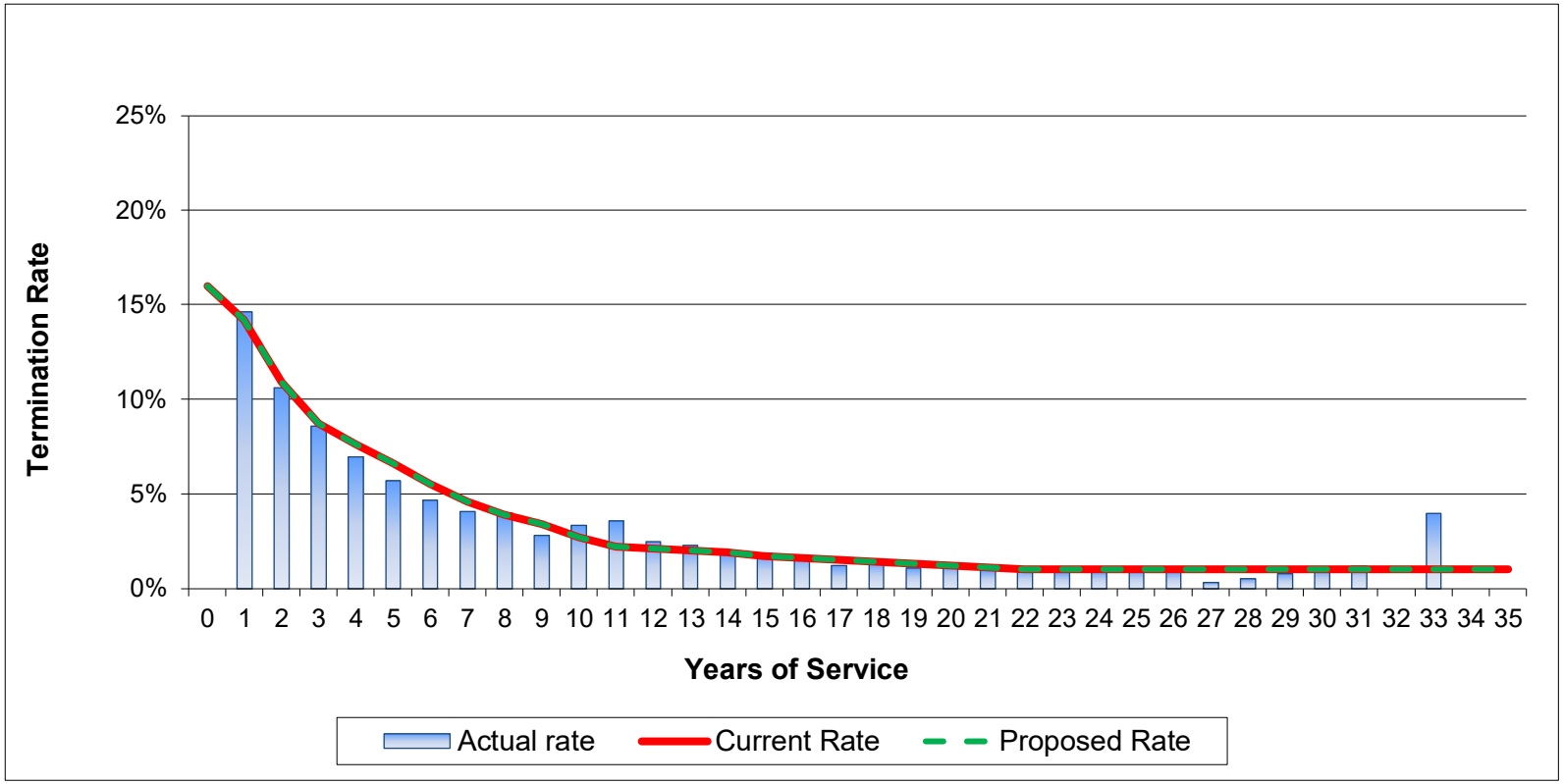
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-8

Termination of Employment

School Membership - Females (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	208,838	213,608	213,608
Actual/Expected		98%	98%

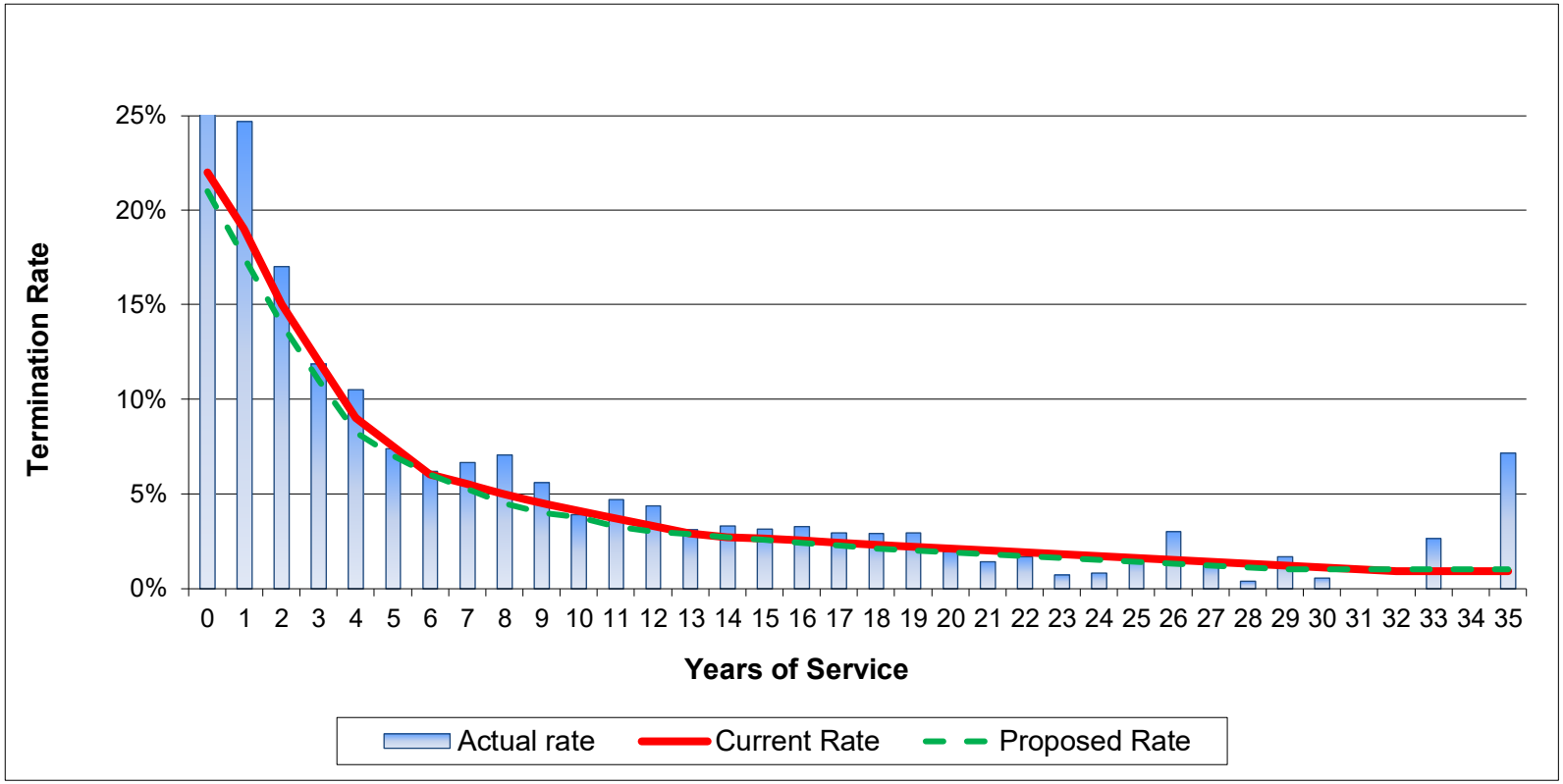
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-9

Termination of Employment

Other Membership - Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	6,709	5,567	5,174
Actual/Expected		121%	130%

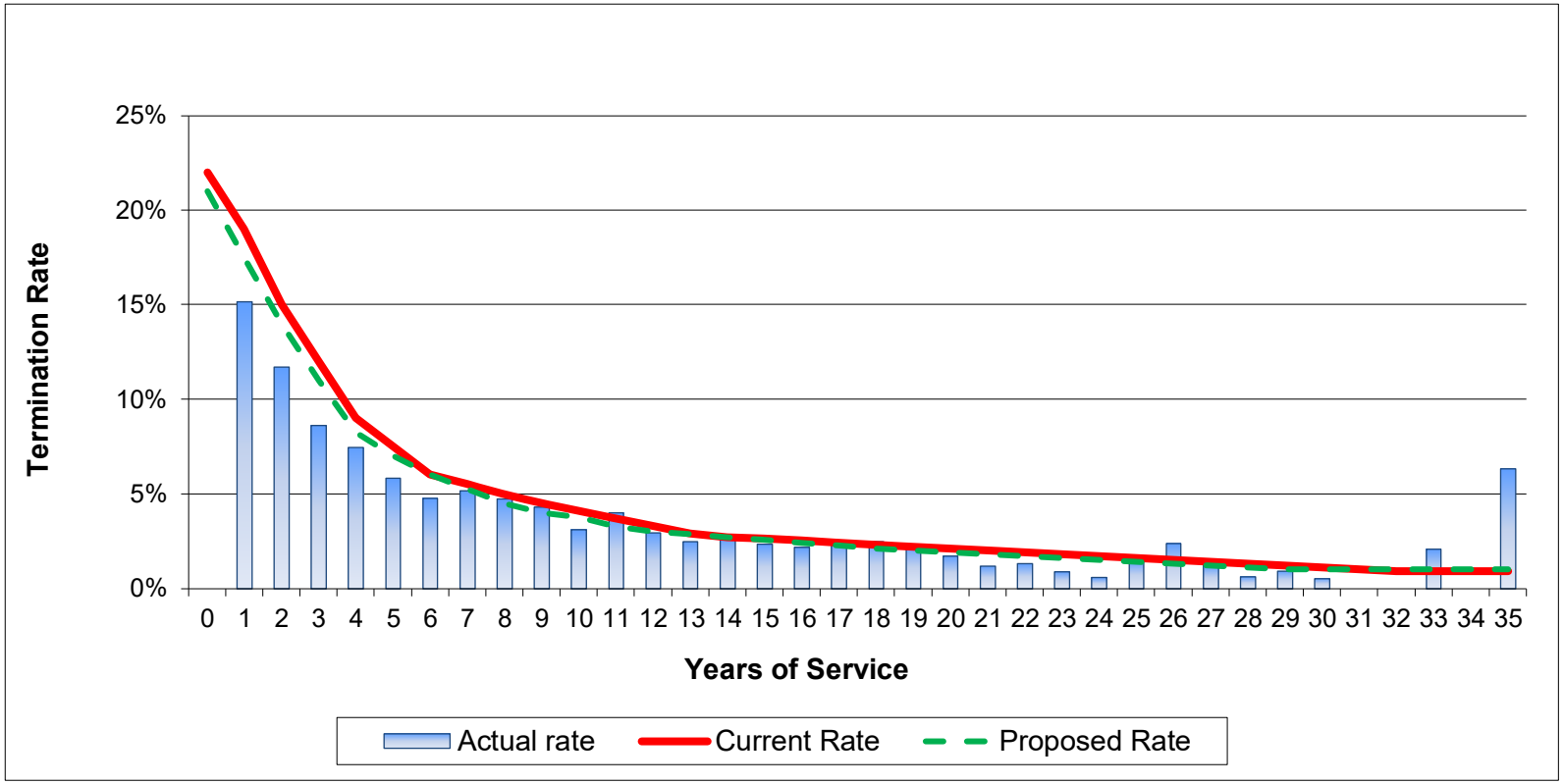
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-10

Termination of Employment

Other Membership - Males (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	96,502	113,570	105,159
Actual/Expected		85%	92%

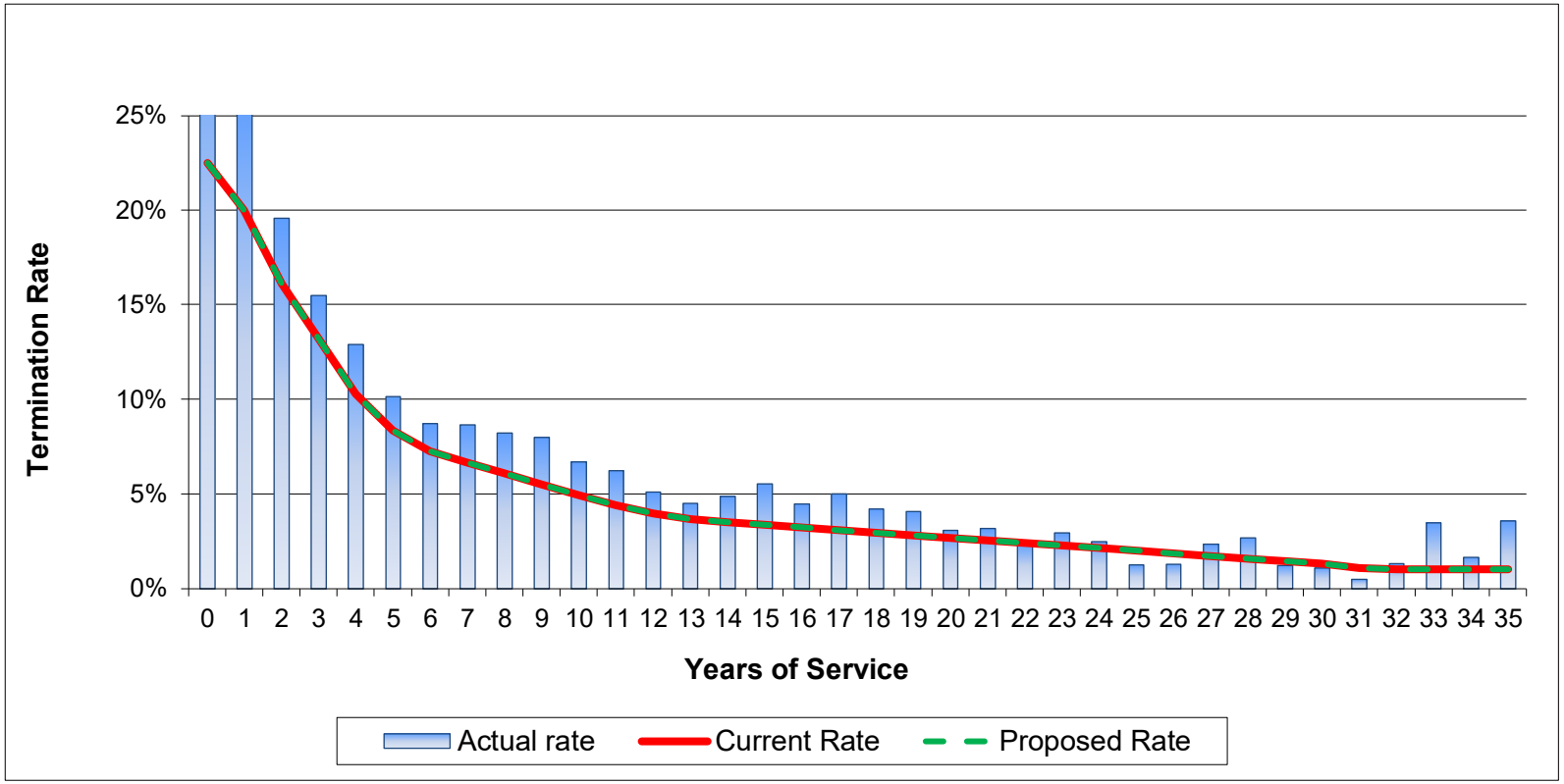
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-11

Termination of Employment

Other Membership - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	13,482	10,558	10,558
Actual/Expected		128%	128%

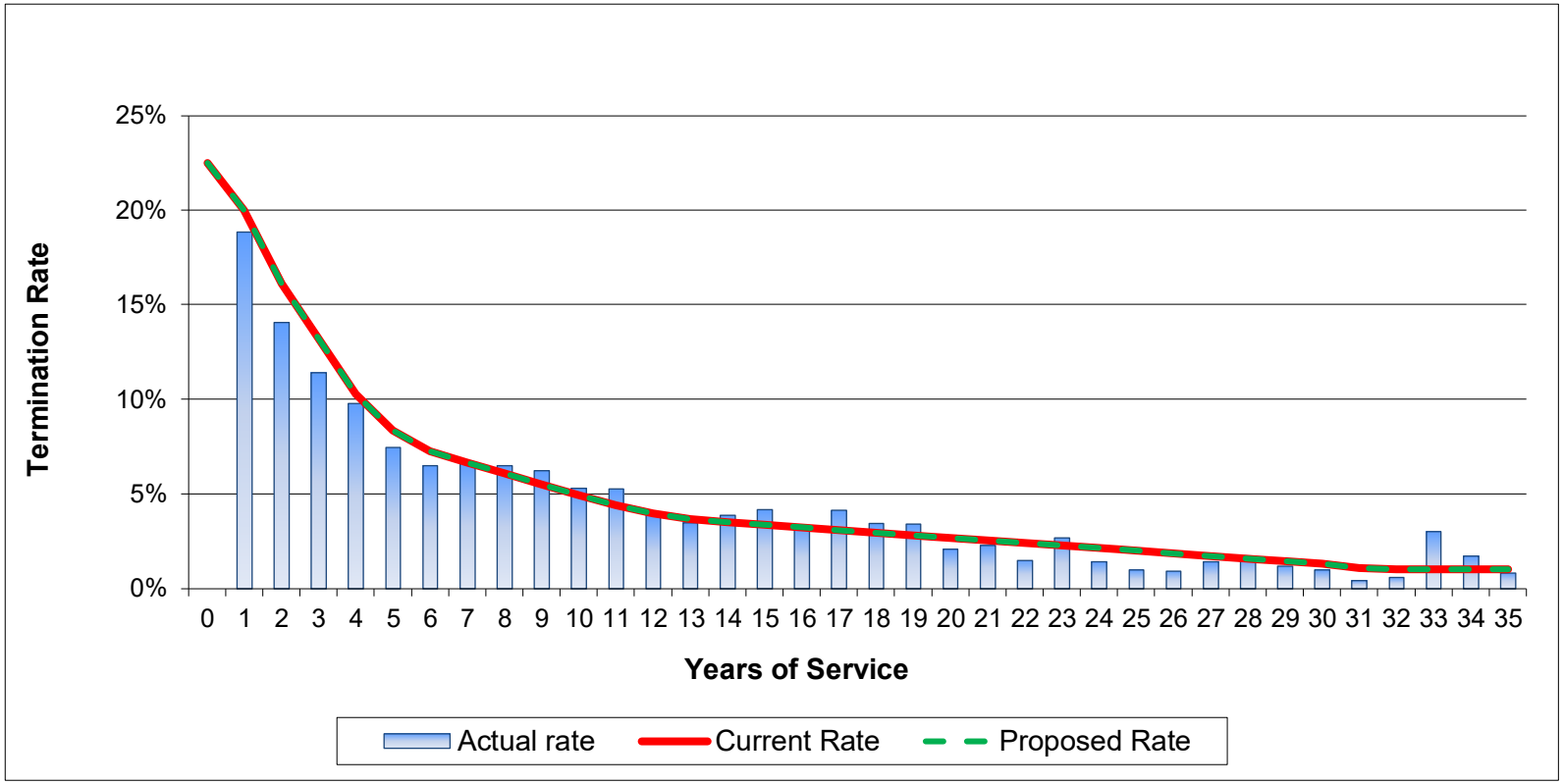
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-12

Termination of Employment

Other Membership - Females (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	166,975	169,865	169,865
Actual/Expected		98%	98%

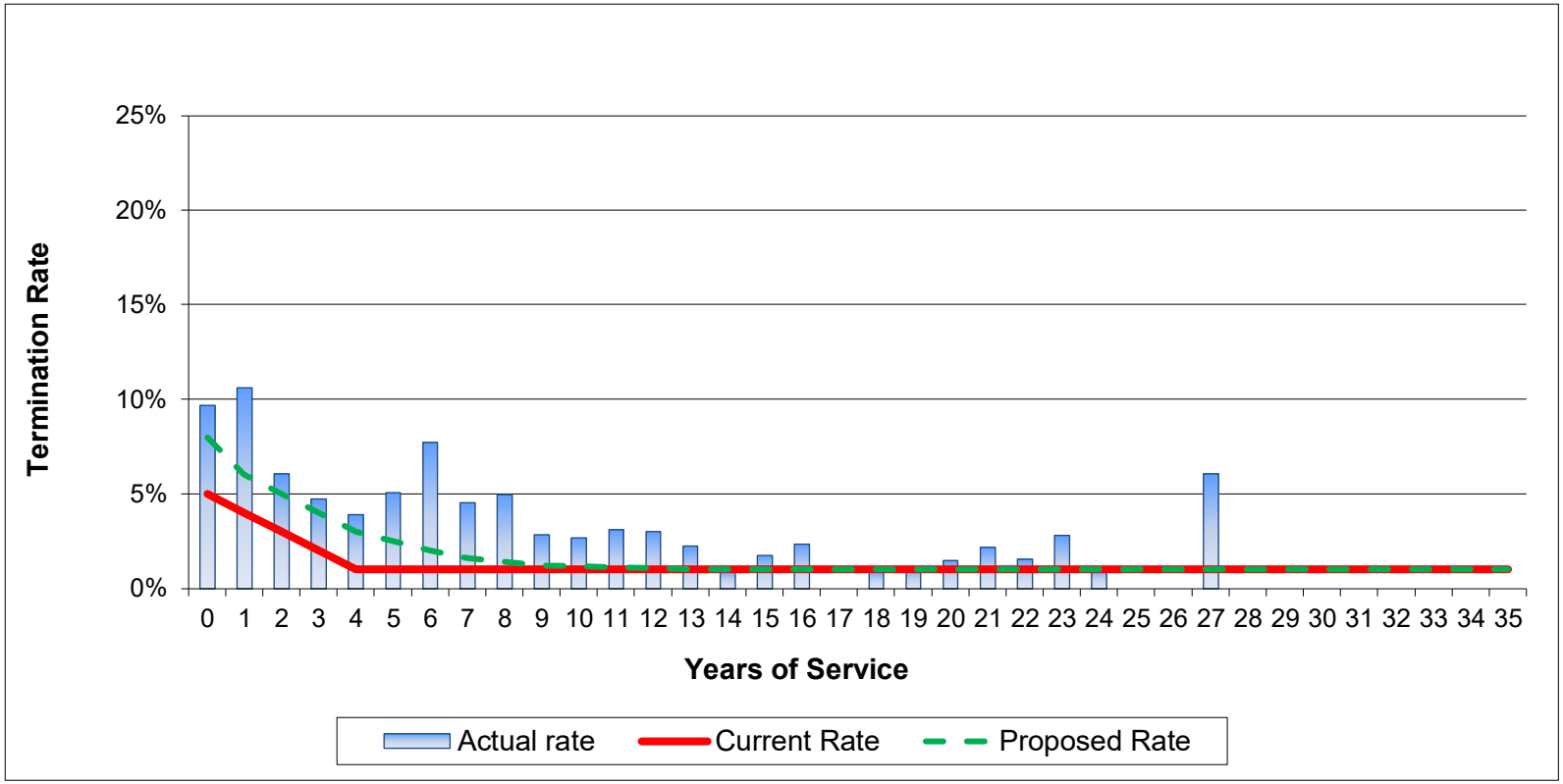
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-13

Termination of Employment

Sheriffs and Deputies Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	190	73	106
Actual/Expected		260%	179%

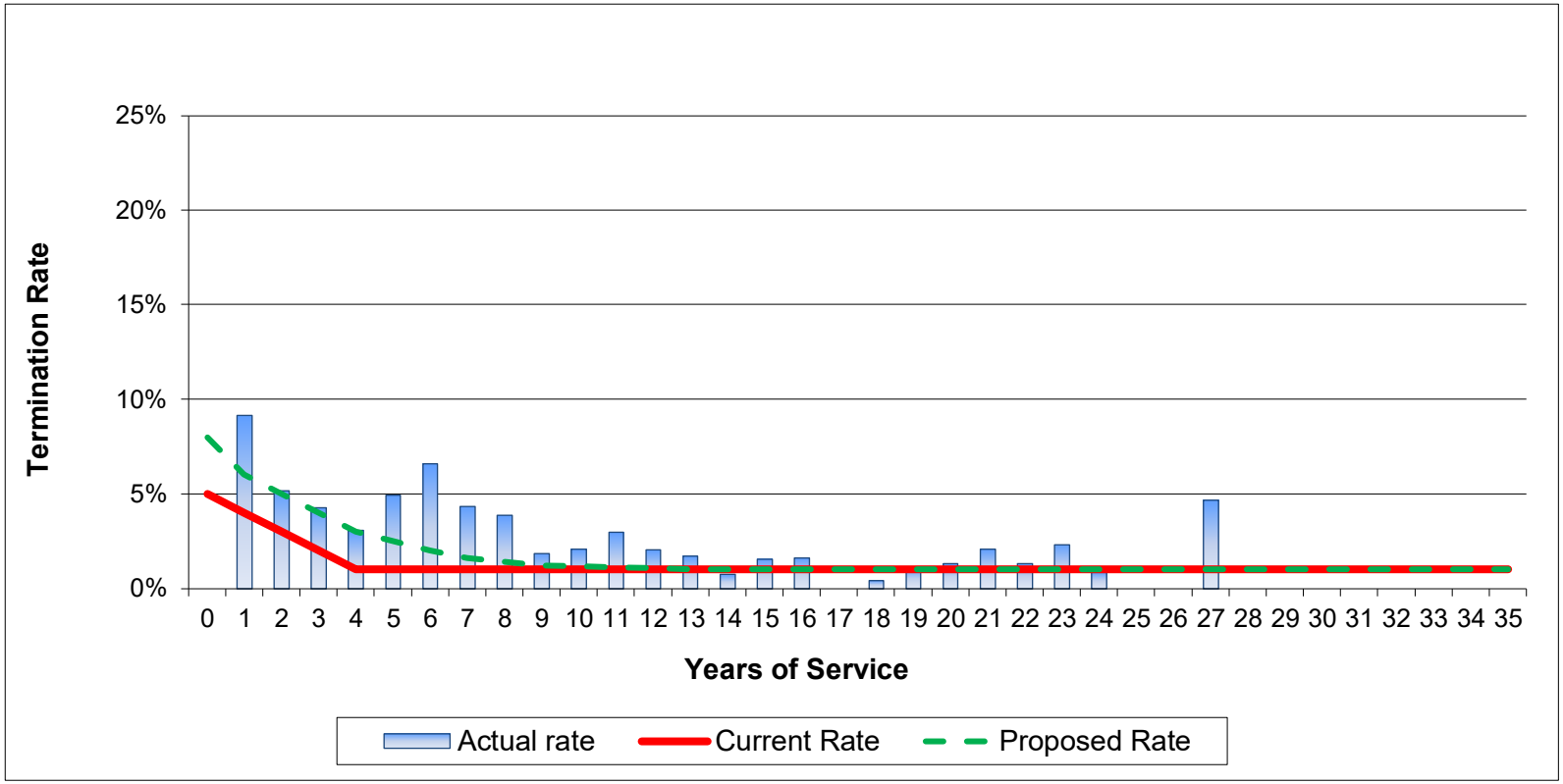
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-14

Termination of Employment

Sheriffs and Deputies Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	8,003	4,656	5,385
Actual/Expected		172%	149%

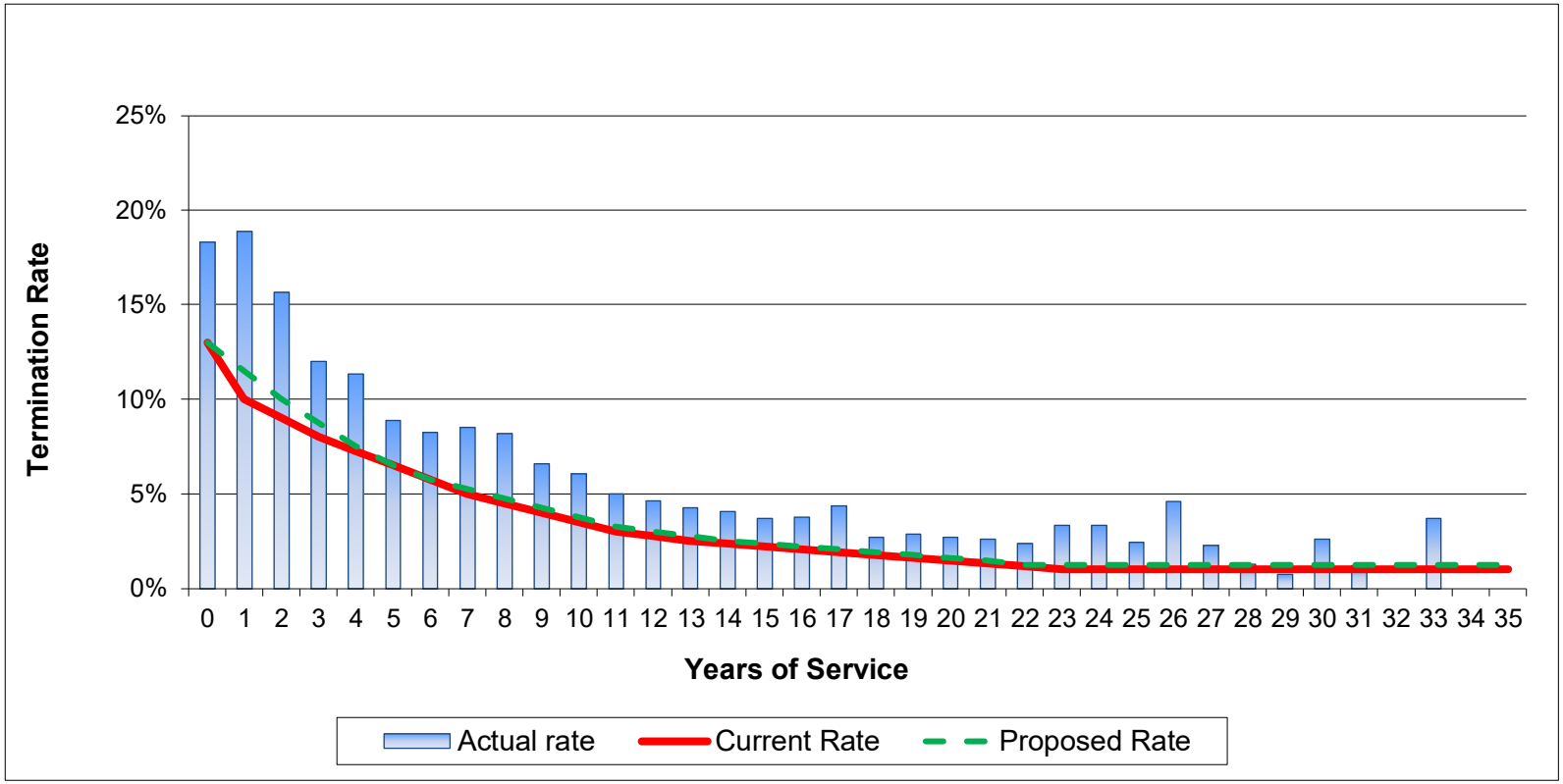
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-15

Termination of Employment

Protecion Occupations Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	2,188	1,301	1,409
Actual/Expected		168%	155%

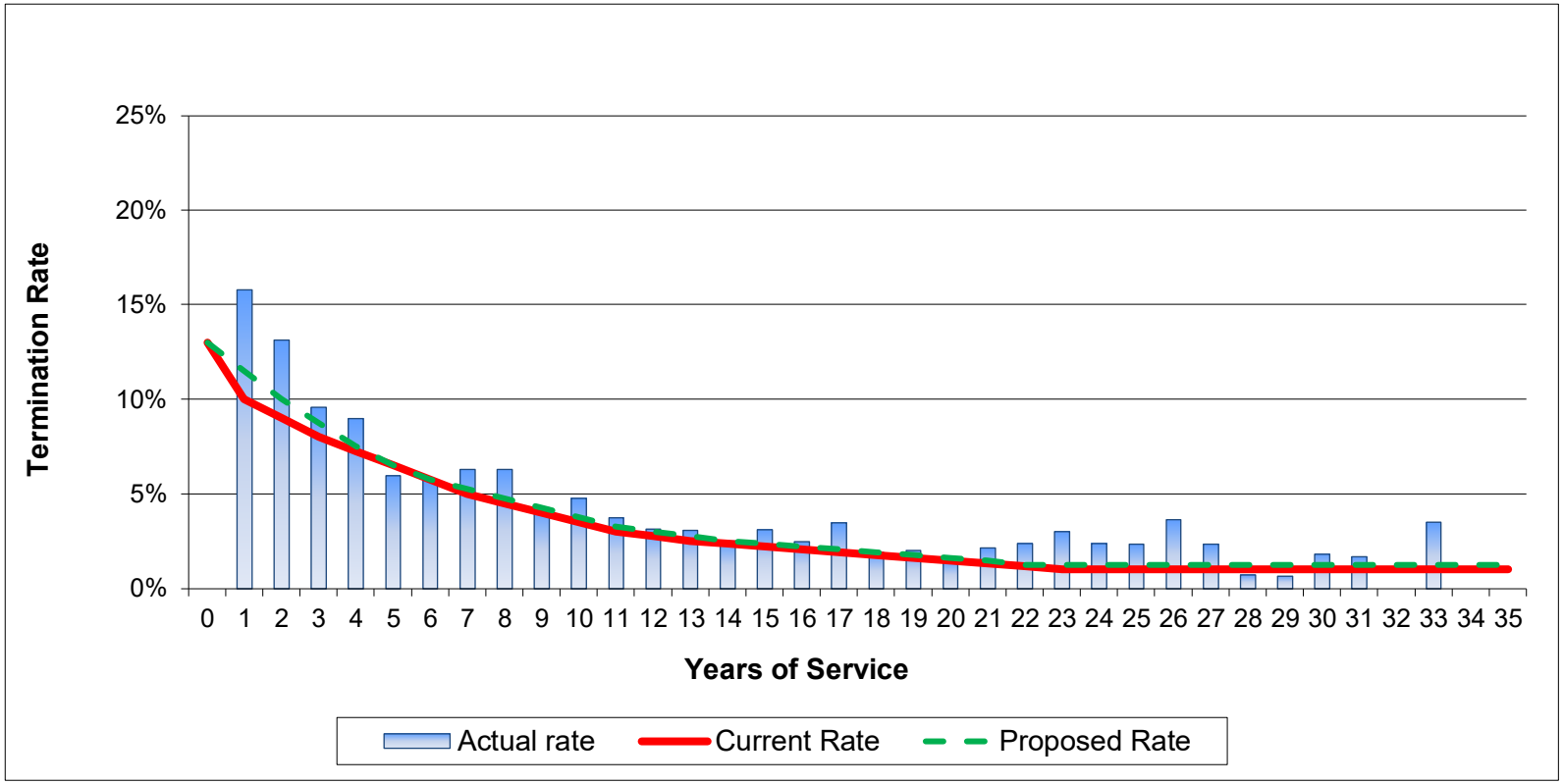
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit H-16

Termination of Employment

Protecion Occupations Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	44,378	32,943	35,839
Actual/Expected		135%	124%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-1

Termination of Employment

State Membership - Males

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	511	118	23.1%	71.5	14.0%	81.8	16.0%
1	1,844	353	19.1%	202.8	11.0%	258.2	14.0%
2	1,385	206	14.9%	117.7	8.5%	145.4	10.5%
3	1,117	116	10.4%	78.2	7.0%	92.2	8.3%
4	967	86	8.9%	55.6	5.8%	62.9	6.5%
5	835	43	5.1%	39.7	4.8%	43.8	5.3%
6	711	44	6.2%	30.2	4.3%	33.8	4.8%
7	744	53	7.1%	27.9	3.8%	29.8	4.0%
8	661	38	5.7%	21.5	3.3%	23.1	3.5%
9	696	24	3.4%	19.1	2.8%	20.9	3.0%
10	808	31	3.8%	18.2	2.3%	19.4	2.4%
11	779	30	3.9%	15.6	2.0%	15.6	2.0%
12	798	27	3.4%	15.2	1.9%	15.2	1.9%
13	694	29	4.2%	12.5	1.8%	12.5	1.8%
14	575	8	1.4%	9.8	1.7%	9.8	1.7%
15	473	7	1.5%	7.6	1.6%	7.6	1.6%
16	402	10	2.5%	6.0	1.5%	6.0	1.5%
17	438	12	2.7%	6.1	1.4%	6.1	1.4%
18	486	15	3.1%	6.3	1.3%	6.3	1.3%
19	522	5	1.0%	6.3	1.2%	6.3	1.2%
20	560	9	1.6%	6.2	1.1%	6.2	1.1%
21	523	13	2.5%	4.7	0.9%	5.2	1.0%
22	465	5	1.1%	3.7	0.8%	4.7	1.0%
23	387	8	2.1%	3.1	0.8%	3.9	1.0%
24	332	4	1.2%	2.7	0.8%	3.3	1.0%
25	271	1	0.4%	2.2	0.8%	2.7	1.0%
26	203	2	1.0%	1.6	0.8%	2.0	1.0%
27	168	1	0.6%	1.3	0.8%	1.7	1.0%
28	158	1	0.6%	1.3	0.8%	1.6	1.0%
29	157	1	0.6%	1.3	0.8%	1.6	1.0%
30	132	2	1.5%	1.1	0.8%	1.3	1.0%
31	100	3	3.0%	0.8	0.8%	1.0	1.0%
32	55	-	0.0%	0.4	0.8%	0.6	1.0%
33	32	1	3.1%	0.3	0.8%	0.3	1.0%
34	27	1	3.7%	0.2	0.8%	0.3	1.0%
35	17	-	0.0%	0.1	0.8%	0.2	1.0%
	19,033	1,307	6.9%	798.7	4.9%	932.9	4.9%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-2

Termination of Employment

State Membership - Males (Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	-	-	0.0%	-	14.0%	-	16.0%
1	5,659	848	15.0%	622.5	11.0%	792.3	14.0%
2	13,293	1,701	12.8%	1,129.9	8.5%	1,395.7	10.5%
3	17,163	1,544	9.0%	1,201.4	7.0%	1,415.9	8.3%
4	21,064	1,580	7.5%	1,211.2	5.8%	1,369.2	6.5%
5	23,820	1,082	4.5%	1,131.4	4.8%	1,250.5	5.3%
6	25,869	1,413	5.5%	1,099.4	4.3%	1,228.8	4.8%
7	31,734	2,147	6.8%	1,190.0	3.8%	1,269.3	4.0%
8	32,985	1,810	5.5%	1,072.0	3.3%	1,154.5	3.5%
9	41,540	1,350	3.3%	1,142.4	2.8%	1,246.2	3.0%
10	55,362	1,762	3.2%	1,245.6	2.3%	1,328.7	2.4%
11	59,745	2,482	4.2%	1,194.9	2.0%	1,194.9	2.0%
12	68,215	1,915	2.8%	1,296.1	1.9%	1,296.1	1.9%
13	65,732	2,407	3.7%	1,183.2	1.8%	1,183.2	1.8%
14	59,579	623	1.0%	1,012.8	1.7%	1,012.8	1.7%
15	52,784	552	1.0%	844.6	1.6%	844.6	1.6%
16	48,313	874	1.8%	724.7	1.5%	724.7	1.5%
17	56,888	1,411	2.5%	796.4	1.4%	796.4	1.4%
18	66,236	2,125	3.2%	861.1	1.3%	861.1	1.3%
19	76,775	878	1.1%	921.3	1.2%	921.3	1.2%
20	86,761	1,345	1.6%	954.4	1.1%	954.4	1.1%
21	86,660	1,851	2.1%	779.9	0.9%	866.6	1.0%
22	80,743	862	1.1%	645.9	0.8%	807.4	1.0%
23	69,655	1,151	1.7%	557.2	0.8%	696.5	1.0%
24	63,561	737	1.2%	508.5	0.8%	635.6	1.0%
25	54,495	94	0.2%	436.0	0.8%	544.9	1.0%
26	43,110	498	1.2%	344.9	0.8%	431.1	1.0%
27	39,378	168	0.4%	315.0	0.8%	393.8	1.0%
28	38,504	222	0.6%	308.0	0.8%	385.0	1.0%
29	38,189	282	0.7%	305.5	0.8%	381.9	1.0%
30	33,167	470	1.4%	265.3	0.8%	331.7	1.0%
31	25,259	721	2.9%	202.1	0.8%	252.6	1.0%
32	14,227	-	0.0%	113.8	0.8%	142.3	1.0%
33	7,777	224	2.9%	62.2	0.8%	77.8	1.0%
34	6,279	361	5.7%	50.2	0.8%	62.8	1.0%
35	3,511	-	0.0%	28.1	0.8%	35.1	1.0%
	1,514,030	37,490	2.5%	25,758.1	1.9%	28,285.7	1.9%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-3

Termination of Employment

State Membership - Females

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	659	181	27.5%	92.3	14.0%	105.4	16.0%
1	2,561	522	20.4%	281.7	11.0%	363.7	14.2%
2	1,817	264	14.5%	154.4	8.5%	198.1	10.9%
3	1,512	189	12.5%	105.8	7.0%	131.5	8.7%
4	1,377	132	9.6%	79.2	5.8%	104.7	7.6%
5	1,237	88	7.1%	58.8	4.8%	81.6	6.6%
6	1,081	69	6.4%	45.9	4.3%	59.5	5.5%
7	1,039	80	7.7%	39.0	3.8%	47.8	4.6%
8	859	48	5.6%	27.9	3.3%	36.9	4.3%
9	934	51	5.5%	25.7	2.8%	32.7	3.5%
10	1,129	65	5.8%	25.4	2.3%	36.7	3.3%
11	1,108	44	4.0%	22.2	2.0%	33.2	3.0%
12	1,212	37	3.1%	23.0	1.9%	33.3	2.8%
13	1,111	39	3.5%	20.0	1.8%	27.8	2.5%
14	969	27	2.8%	16.5	1.7%	21.8	2.3%
15	825	34	4.1%	13.2	1.6%	16.5	2.0%
16	693	12	1.7%	10.4	1.5%	12.1	1.8%
17	691	15	2.2%	9.7	1.4%	11.1	1.6%
18	726	17	2.3%	9.4	1.3%	10.9	1.5%
19	752	23	3.1%	9.0	1.2%	10.5	1.4%
20	746	16	2.1%	8.2	1.1%	9.7	1.3%
21	623	13	2.1%	5.6	0.9%	7.5	1.2%
22	550	10	1.8%	4.4	0.8%	6.1	1.1%
23	456	12	2.6%	3.6	0.8%	4.6	1.0%
24	369	3	0.8%	3.0	0.8%	3.7	1.0%
25	319	6	1.9%	2.6	0.8%	3.2	1.0%
26	252	3	1.2%	2.0	0.8%	2.5	1.0%
27	223	3	1.3%	1.8	0.8%	2.2	1.0%
28	233	3	1.3%	1.9	0.8%	2.3	1.0%
29	237	2	0.8%	1.9	0.8%	2.4	1.0%
30	228	2	0.9%	1.8	0.8%	2.3	1.0%
31	177	-	0.0%	1.4	0.8%	1.8	1.0%
32	122	2	1.6%	1.0	0.8%	1.2	1.0%
33	79	-	0.0%	0.6	0.8%	0.8	1.0%
34	59	-	0.0%	0.5	0.8%	0.6	1.0%
35	32	1	3.1%	0.3	0.8%	0.3	1.0%
	26,997	2,013	7.5%	1,110.0	5.3%	1,426.9	5.3%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-4

Termination of Employment

State Membership - Females (Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	-	-	0.0%	-	14.0%	-	16.0%
1	7,344	1,291	17.6%	807.8	11.0%	1,042.8	14.2%
2	16,089	2,100	13.0%	1,367.6	8.5%	1,753.7	10.9%
3	20,800	2,165	10.4%	1,456.0	7.0%	1,809.6	8.7%
4	26,723	2,252	8.4%	1,536.6	5.8%	2,030.9	7.6%
5	31,635	2,037	6.4%	1,502.6	4.8%	2,087.9	6.6%
6	33,973	2,141	6.3%	1,443.8	4.3%	1,868.5	5.5%
7	39,523	2,719	6.9%	1,482.1	3.8%	1,818.1	4.6%
8	39,496	2,131	5.4%	1,283.6	3.3%	1,698.3	4.3%
9	50,080	2,410	4.8%	1,377.2	2.8%	1,752.8	3.5%
10	69,548	3,623	5.2%	1,564.8	2.3%	2,260.3	3.3%
11	76,034	2,512	3.3%	1,520.7	2.0%	2,281.0	3.0%
12	92,955	2,717	2.9%	1,766.2	1.9%	2,556.3	2.8%
13	94,218	2,899	3.1%	1,695.9	1.8%	2,355.4	2.5%
14	90,545	2,262	2.5%	1,539.3	1.7%	2,037.3	2.3%
15	84,403	3,300	3.9%	1,350.4	1.6%	1,688.1	2.0%
16	76,795	1,262	1.6%	1,151.9	1.5%	1,343.9	1.8%
17	81,287	1,466	1.8%	1,138.0	1.4%	1,300.6	1.6%
18	90,453	1,827	2.0%	1,175.9	1.3%	1,356.8	1.5%
19	99,092	2,622	2.6%	1,189.1	1.2%	1,387.3	1.4%
20	104,057	2,024	1.9%	1,144.6	1.1%	1,352.7	1.3%
21	92,056	1,769	1.9%	828.5	0.9%	1,104.7	1.2%
22	86,210	1,687	2.0%	689.7	0.8%	948.3	1.1%
23	74,576	1,748	2.3%	596.6	0.8%	745.8	1.0%
24	62,997	325	0.5%	504.0	0.8%	630.0	1.0%
25	58,333	842	1.4%	466.7	0.8%	583.3	1.0%
26	46,936	385	0.8%	375.5	0.8%	469.4	1.0%
27	43,207	562	1.3%	345.7	0.8%	432.1	1.0%
28	47,587	705	1.5%	380.7	0.8%	475.9	1.0%
29	50,047	499	1.0%	400.4	0.8%	500.5	1.0%
30	50,879	354	0.7%	407.0	0.8%	508.8	1.0%
31	41,013	-	0.0%	328.1	0.8%	410.1	1.0%
32	29,380	261	0.9%	235.0	0.8%	293.8	1.0%
33	17,469	-	0.0%	139.7	0.8%	174.7	1.0%
34	12,983	-	0.0%	103.9	0.8%	129.8	1.0%
35	6,983	21	0.3%	55.9	0.8%	69.8	1.0%
	1,945,704	54,918	2.8%	33,351.5	2.2%	43,259.1	2.2%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-5

Termination of Employment

School Membership - Males

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	1,282	405	31.6%	205.1	16.0%	205.1	16.0%
1	5,900	1,398	23.7%	837.8	14.2%	837.8	14.2%
2	4,439	723	16.3%	483.9	10.9%	483.9	10.9%
3	3,743	457	12.2%	325.6	8.7%	325.6	8.7%
4	3,393	339	10.0%	257.9	7.6%	257.9	7.6%
5	3,126	249	8.0%	206.3	6.6%	206.3	6.6%
6	2,872	187	6.5%	158.0	5.5%	158.0	5.5%
7	2,583	143	5.5%	118.8	4.6%	118.8	4.6%
8	2,242	108	4.8%	87.4	3.9%	87.4	3.9%
9	2,025	77	3.8%	68.9	3.4%	68.9	3.4%
10	1,948	73	3.7%	52.6	2.7%	52.6	2.7%
11	1,914	68	3.6%	42.1	2.2%	42.1	2.2%
12	1,917	49	2.6%	40.3	2.1%	40.3	2.1%
13	1,881	58	3.1%	37.6	2.0%	37.6	2.0%
14	1,703	31	1.8%	32.4	1.9%	32.4	1.9%
15	1,586	34	2.1%	27.0	1.7%	27.0	1.7%
16	1,472	32	2.2%	23.6	1.6%	23.6	1.6%
17	1,449	26	1.8%	21.7	1.5%	21.7	1.5%
18	1,436	28	1.9%	20.1	1.4%	20.1	1.4%
19	1,442	19	1.3%	18.7	1.3%	18.7	1.3%
20	1,404	20	1.4%	16.8	1.2%	16.8	1.2%
21	1,276	24	1.9%	14.0	1.1%	14.0	1.1%
22	1,164	12	1.0%	11.6	1.0%	11.6	1.0%
23	1,080	23	2.1%	10.8	1.0%	10.8	1.0%
24	950	12	1.3%	9.5	1.0%	9.5	1.0%
25	883	16	1.8%	8.8	1.0%	8.8	1.0%
26	780	9	1.2%	7.8	1.0%	7.8	1.0%
27	654	5	0.8%	6.5	1.0%	6.5	1.0%
28	570	4	0.7%	5.7	1.0%	5.7	1.0%
29	450	2	0.4%	4.5	1.0%	4.5	1.0%
30	352	3	0.9%	3.5	1.0%	3.5	1.0%
31	244	-	0.0%	2.4	1.0%	2.4	1.0%
32	98	1	1.0%	1.0	1.0%	1.0	1.0%
33	23	-	0.0%	0.2	1.0%	0.2	1.0%
34	15	-	0.0%	0.2	1.0%	0.2	1.0%
35	10	-	0.0%	0.1	1.0%	0.1	1.0%
	58,306	4,635	7.9%	3,169.3	5.4%	3,169.3	5.4%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-6

Termination of Employment

School Membership - Males (Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	-	-	0.0%	-	16.0%	-	16.0%
1	12,017	1,782	14.8%	1,706.4	14.2%	1,706.4	14.2%
2	27,669	2,976	10.8%	3,015.9	10.9%	3,015.9	10.9%
3	40,740	3,508	8.6%	3,544.4	8.7%	3,544.4	8.7%
4	54,403	3,527	6.5%	4,134.6	7.6%	4,134.6	7.6%
5	68,116	3,893	5.7%	4,495.7	6.6%	4,495.7	6.6%
6	80,801	3,800	4.7%	4,444.1	5.5%	4,444.1	5.5%
7	89,483	3,437	3.8%	4,116.2	4.6%	4,116.2	4.6%
8	94,247	3,644	3.9%	3,675.7	3.9%	3,675.7	3.9%
9	99,526	2,604	2.6%	3,383.9	3.4%	3,383.9	3.4%
10	111,466	2,917	2.6%	3,009.6	2.7%	3,009.6	2.7%
11	125,453	2,947	2.3%	2,760.0	2.2%	2,760.0	2.2%
12	142,474	2,989	2.1%	2,992.0	2.1%	2,992.0	2.1%
13	156,040	3,576	2.3%	3,120.8	2.0%	3,120.8	2.0%
14	156,463	2,008	1.3%	2,972.8	1.9%	2,972.8	1.9%
15	158,751	2,202	1.4%	2,698.8	1.7%	2,698.8	1.7%
16	160,559	2,534	1.6%	2,568.9	1.6%	2,568.9	1.6%
17	169,496	2,417	1.4%	2,542.4	1.5%	2,542.4	1.5%
18	181,533	2,014	1.1%	2,541.5	1.4%	2,541.5	1.4%
19	198,590	1,839	0.9%	2,581.7	1.3%	2,581.7	1.3%
20	209,290	2,544	1.2%	2,511.5	1.2%	2,511.5	1.2%
21	203,950	3,194	1.6%	2,243.4	1.1%	2,243.4	1.1%
22	198,497	1,683	0.8%	1,985.0	1.0%	1,985.0	1.0%
23	194,468	3,127	1.6%	1,944.7	1.0%	1,944.7	1.0%
24	181,738	2,009	1.1%	1,817.4	1.0%	1,817.4	1.0%
25	177,188	2,862	1.6%	1,771.9	1.0%	1,771.9	1.0%
26	166,767	1,558	0.9%	1,667.7	1.0%	1,667.7	1.0%
27	148,300	1,342	0.9%	1,483.0	1.0%	1,483.0	1.0%
28	133,283	1,203	0.9%	1,332.8	1.0%	1,332.8	1.0%
29	106,996	581	0.5%	1,070.0	1.0%	1,070.0	1.0%
30	86,348	776	0.9%	863.5	1.0%	863.5	1.0%
31	61,140	-	0.0%	611.4	1.0%	611.4	1.0%
32	23,742	327	1.4%	237.4	1.0%	237.4	1.0%
33	3,984	-	0.0%	39.8	1.0%	39.8	1.0%
34	2,389	-	0.0%	23.9	1.0%	23.9	1.0%
35	2,220	-	0.0%	22.2	1.0%	22.2	1.0%
	4,028,127	75,819	1.9%	79,930.7	2.0%	79,930.7	2.0%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-7

Termination of Employment

School Membership - Females

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	2,876	854	29.7%	460.2	16.0%	460.2	16.0%
1	21,149	4,749	22.5%	3,003.2	14.2%	3,003.2	14.2%
2	16,505	2,618	15.9%	1,799.0	10.9%	1,799.0	10.9%
3	14,325	1,788	12.5%	1,246.3	8.7%	1,246.3	8.7%
4	12,620	1,259	10.0%	959.1	7.6%	959.1	7.6%
5	11,400	969	8.5%	752.4	6.6%	752.4	6.6%
6	10,361	720	6.9%	569.9	5.5%	569.9	5.5%
7	9,251	579	6.3%	425.5	4.6%	425.5	4.6%
8	8,161	477	5.8%	318.3	3.9%	318.3	3.9%
9	7,412	311	4.2%	252.0	3.4%	252.0	3.4%
10	7,120	372	5.2%	192.2	2.7%	192.2	2.7%
11	6,907	356	5.2%	152.0	2.2%	152.0	2.2%
12	6,846	270	3.9%	143.8	2.1%	143.8	2.1%
13	6,455	217	3.4%	129.1	2.0%	129.1	2.0%
14	5,944	164	2.8%	112.9	1.9%	112.9	1.9%
15	5,399	155	2.9%	91.8	1.7%	91.8	1.7%
16	4,939	127	2.6%	79.0	1.6%	79.0	1.6%
17	4,668	91	1.9%	70.0	1.5%	70.0	1.5%
18	4,467	93	2.1%	62.5	1.4%	62.5	1.4%
19	4,161	70	1.7%	54.1	1.3%	54.1	1.3%
20	3,822	71	1.9%	45.9	1.2%	45.9	1.2%
21	3,435	54	1.6%	37.8	1.1%	37.8	1.1%
22	3,006	43	1.4%	30.1	1.0%	30.1	1.0%
23	2,685	30	1.1%	26.9	1.0%	26.9	1.0%
24	2,395	25	1.0%	24.0	1.0%	24.0	1.0%
25	2,174	25	1.1%	21.7	1.0%	21.7	1.0%
26	1,897	24	1.3%	19.0	1.0%	19.0	1.0%
27	1,614	7	0.4%	16.1	1.0%	16.1	1.0%
28	1,401	9	0.6%	14.0	1.0%	14.0	1.0%
29	1,144	9	0.8%	11.4	1.0%	11.4	1.0%
30	880	13	1.5%	8.8	1.0%	8.8	1.0%
31	614	6	1.0%	6.1	1.0%	6.1	1.0%
32	296	-	0.0%	3.0	1.0%	3.0	1.0%
33	35	2	5.7%	0.4	1.0%	0.4	1.0%
34	23	-	0.0%	0.2	1.0%	0.2	1.0%
35	16	-	0.0%	0.2	1.0%	0.2	1.0%
	196,403	16,557	8.4%	11,138.7	5.7%	11,138.7	5.7%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-8

Termination of Employment

School Membership - Females (Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	-	-	0.0%	-	16.0%	-	16.0%
1	36,961	5,412	14.6%	5,248.4	14.2%	5,248.4	14.2%
2	84,461	8,970	10.6%	9,206.3	10.9%	9,206.3	10.9%
3	126,197	10,847	8.6%	10,979.1	8.7%	10,979.1	8.7%
4	163,577	11,380	7.0%	12,431.9	7.6%	12,431.9	7.6%
5	200,196	11,423	5.7%	13,212.9	6.6%	13,212.9	6.6%
6	232,491	10,819	4.7%	12,787.0	5.5%	12,787.0	5.5%
7	255,555	10,387	4.1%	11,755.5	4.6%	11,755.5	4.6%
8	270,096	10,770	4.0%	10,533.7	3.9%	10,533.7	3.9%
9	286,164	8,063	2.8%	9,729.6	3.4%	9,729.6	3.4%
10	315,875	10,562	3.3%	8,528.6	2.7%	8,528.6	2.7%
11	350,937	12,556	3.6%	7,720.6	2.2%	7,720.6	2.2%
12	399,261	9,948	2.5%	8,384.5	2.1%	8,384.5	2.1%
13	426,264	9,680	2.3%	8,525.3	2.0%	8,525.3	2.0%
14	439,876	8,366	1.9%	8,357.7	1.9%	8,357.7	1.9%
15	441,270	8,068	1.8%	7,501.6	1.7%	7,501.6	1.7%
16	441,643	7,637	1.7%	7,066.3	1.6%	7,066.3	1.6%
17	452,999	5,525	1.2%	6,795.0	1.5%	6,795.0	1.5%
18	468,999	6,645	1.4%	6,566.0	1.4%	6,566.0	1.4%
19	471,947	5,170	1.1%	6,135.3	1.3%	6,135.3	1.3%
20	466,265	5,916	1.3%	5,595.2	1.2%	5,595.2	1.2%
21	450,035	4,401	1.0%	4,950.4	1.1%	4,950.4	1.1%
22	419,536	4,200	1.0%	4,195.4	1.0%	4,195.4	1.0%
23	403,968	3,612	0.9%	4,039.7	1.0%	4,039.7	1.0%
24	386,365	3,574	0.9%	3,863.6	1.0%	3,863.6	1.0%
25	370,285	3,648	1.0%	3,702.8	1.0%	3,702.8	1.0%
26	343,459	3,085	0.9%	3,434.6	1.0%	3,434.6	1.0%
27	305,926	987	0.3%	3,059.3	1.0%	3,059.3	1.0%
28	280,038	1,411	0.5%	2,800.4	1.0%	2,800.4	1.0%
29	240,197	1,886	0.8%	2,402.0	1.0%	2,402.0	1.0%
30	190,700	1,981	1.0%	1,907.0	1.0%	1,907.0	1.0%
31	138,576	1,658	1.2%	1,385.8	1.0%	1,385.8	1.0%
32	67,622	-	0.0%	676.2	1.0%	676.2	1.0%
33	6,304	251	4.0%	63.0	1.0%	63.0	1.0%
34	4,160	-	0.0%	41.6	1.0%	41.6	1.0%
35	2,591	-	0.0%	25.9	1.0%	25.9	1.0%
	9,940,796	208,838	2.1%	213,608.1	2.1%	213,608.1	2.1%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-9

Termination of Employment

Other Membership - Males

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	2,669	876	32.8%	587.2	22.0%	560.5	21.0%
1	8,497	2,099	24.7%	1,614.4	19.0%	1,487.0	17.5%
2	6,346	1,081	17.0%	951.9	15.0%	888.4	14.0%
3	5,118	607	11.9%	614.2	12.0%	563.0	11.0%
4	4,509	474	10.5%	405.8	9.0%	372.0	8.3%
5	3,769	279	7.4%	282.7	7.5%	263.8	7.0%
6	3,272	203	6.2%	196.3	6.0%	196.3	6.0%
7	2,880	192	6.7%	158.4	5.5%	151.2	5.3%
8	2,435	172	7.1%	121.8	5.0%	109.6	4.5%
9	2,237	125	5.6%	100.7	4.5%	89.5	4.0%
10	2,128	83	3.9%	87.2	4.1%	79.8	3.8%
11	1,929	91	4.7%	71.4	3.7%	62.7	3.3%
12	1,850	81	4.4%	61.1	3.3%	55.5	3.0%
13	1,576	49	3.1%	45.4	2.9%	44.9	2.9%
14	1,327	44	3.3%	35.8	2.7%	35.8	2.7%
15	1,175	37	3.1%	31.0	2.6%	30.0	2.6%
16	1,098	36	3.3%	27.7	2.5%	26.4	2.4%
17	1,122	33	2.9%	26.9	2.4%	25.2	2.3%
18	1,139	33	2.9%	26.2	2.3%	23.9	2.1%
19	1,125	33	2.9%	24.8	2.2%	22.5	2.0%
20	979	19	1.9%	20.6	2.1%	18.6	1.9%
21	782	11	1.4%	15.6	2.0%	14.1	1.8%
22	652	11	1.7%	12.4	1.9%	11.1	1.7%
23	558	4	0.7%	10.0	1.8%	8.9	1.6%
24	499	4	0.8%	8.5	1.7%	7.5	1.5%
25	470	8	1.7%	7.5	1.6%	6.6	1.4%
26	397	12	3.0%	6.0	1.5%	5.2	1.3%
27	309	4	1.3%	4.3	1.4%	3.7	1.2%
28	272	1	0.4%	3.5	1.3%	3.0	1.1%
29	236	4	1.7%	2.8	1.2%	2.4	1.0%
30	185	1	0.5%	2.0	1.1%	1.9	1.0%
31	126	-	0.0%	1.3	1.0%	1.3	1.0%
32	74	-	0.0%	0.7	0.9%	0.7	1.0%
33	38	1	2.6%	0.3	0.9%	0.4	1.0%
34	34	-	0.0%	0.3	0.9%	0.3	1.0%
35	14	1	7.1%	0.1	0.9%	0.1	1.0%
	61,826	6,709	10.9%	5,566.8	8.4%	5,173.7	8.4%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-10

Termination of Employment

Other Membership - Males (Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	-	-	0.0%	-	22.0%	-	21.0%
1	23,033	3,491	15.2%	4,376.3	19.0%	4,030.8	17.5%
2	54,564	6,383	11.7%	8,184.6	15.0%	7,639.0	14.0%
3	71,803	6,182	8.6%	8,616.3	12.0%	7,898.3	11.0%
4	91,719	6,845	7.5%	8,254.7	9.0%	7,566.8	8.3%
5	101,704	5,924	5.8%	7,627.8	7.5%	7,119.3	7.0%
6	109,824	5,219	4.8%	6,589.5	6.0%	6,589.5	6.0%
7	115,020	5,927	5.2%	6,326.1	5.5%	6,038.6	5.3%
8	111,687	5,299	4.7%	5,584.4	5.0%	5,025.9	4.5%
9	119,877	5,169	4.3%	5,394.5	4.5%	4,795.1	4.0%
10	129,545	4,022	3.1%	5,311.4	4.1%	4,857.9	3.8%
11	130,451	5,205	4.0%	4,826.7	3.7%	4,239.6	3.3%
12	136,948	4,038	2.9%	4,519.3	3.3%	4,108.4	3.0%
13	130,200	3,232	2.5%	3,749.8	2.9%	3,710.7	2.9%
14	122,072	3,283	2.7%	3,295.9	2.7%	3,295.9	2.7%
15	119,058	2,785	2.3%	3,143.1	2.6%	3,036.0	2.6%
16	117,198	2,551	2.2%	2,953.4	2.5%	2,812.8	2.4%
17	127,701	3,239	2.5%	3,064.8	2.4%	2,873.3	2.3%
18	131,874	3,276	2.5%	3,033.1	2.3%	2,769.4	2.1%
19	137,537	3,136	2.3%	3,025.8	2.2%	2,750.7	2.0%
20	131,982	2,267	1.7%	2,771.6	2.1%	2,507.7	1.9%
21	112,708	1,320	1.2%	2,254.2	2.0%	2,028.7	1.8%
22	100,921	1,332	1.3%	1,917.5	1.9%	1,715.7	1.7%
23	92,071	796	0.9%	1,657.3	1.8%	1,473.1	1.6%
24	85,358	485	0.6%	1,451.1	1.7%	1,280.4	1.5%
25	83,686	1,212	1.4%	1,339.0	1.6%	1,171.6	1.4%
26	75,022	1,774	2.4%	1,125.3	1.5%	975.3	1.3%
27	59,422	726	1.2%	831.9	1.4%	713.1	1.2%
28	53,406	323	0.6%	694.3	1.3%	587.5	1.1%
29	48,891	447	0.9%	586.7	1.2%	488.9	1.0%
30	41,199	218	0.5%	453.2	1.1%	412.0	1.0%
31	27,989	-	0.0%	279.9	1.0%	279.9	1.0%
32	17,010	-	0.0%	153.1	0.9%	170.1	1.0%
33	8,205	170	2.1%	73.8	0.9%	82.1	1.0%
34	7,895	-	0.0%	71.1	0.9%	79.0	1.0%
35	3,615	229	6.3%	32.5	0.9%	36.2	1.0%
	3,031,198	96,502	3.2%	113,569.9	3.5%	105,159.0	3.5%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-11

Termination of Employment

Other Membership - Females

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	4,308	1,343	31.2%	969.3	22.5%	969.3	22.5%
1	15,294	3,982	26.0%	3,057.8	20.0%	3,057.8	20.0%
2	11,467	2,244	19.6%	1,849.1	16.1%	1,849.1	16.1%
3	9,310	1,443	15.5%	1,227.8	13.2%	1,227.8	13.2%
4	7,734	998	12.9%	792.7	10.3%	792.7	10.3%
5	6,468	656	10.1%	540.1	8.4%	540.1	8.4%
6	5,457	476	8.7%	395.9	7.3%	395.9	7.3%
7	4,714	408	8.7%	314.0	6.7%	314.0	6.7%
8	4,043	332	8.2%	245.2	6.1%	245.2	6.1%
9	3,600	288	8.0%	196.9	5.5%	196.9	5.5%
10	3,226	216	6.7%	158.9	4.9%	158.9	4.9%
11	2,895	180	6.2%	126.8	4.4%	126.8	4.4%
12	2,791	142	5.1%	110.2	4.0%	110.2	4.0%
13	2,480	112	4.5%	90.6	3.7%	90.6	3.7%
14	2,130	104	4.9%	74.1	3.5%	74.1	3.5%
15	1,914	106	5.5%	64.3	3.4%	64.3	3.4%
16	1,697	76	4.5%	54.6	3.2%	54.6	3.2%
17	1,518	76	5.0%	46.6	3.1%	46.6	3.1%
18	1,453	61	4.2%	42.6	2.9%	42.6	2.9%
19	1,399	57	4.1%	39.1	2.8%	39.1	2.8%
20	1,272	39	3.1%	33.8	2.7%	33.8	2.7%
21	1,105	35	3.2%	27.9	2.5%	27.9	2.5%
22	954	23	2.4%	22.8	2.4%	22.8	2.4%
23	780	23	2.9%	17.6	2.3%	17.6	2.3%
24	642	16	2.5%	13.6	2.1%	13.6	2.1%
25	563	7	1.2%	11.1	2.0%	11.1	2.0%
26	464	6	1.3%	8.5	1.8%	8.5	1.8%
27	384	9	2.3%	6.6	1.7%	6.6	1.7%
28	336	9	2.7%	5.3	1.6%	5.3	1.6%
29	332	4	1.2%	4.8	1.4%	4.8	1.4%
30	275	3	1.1%	3.6	1.3%	3.6	1.3%
31	204	1	0.5%	2.2	1.1%	2.2	1.1%
32	152	2	1.3%	1.6	1.0%	1.6	1.0%
33	86	3	3.5%	0.9	1.0%	0.9	1.0%
34	61	1	1.6%	0.6	1.0%	0.6	1.0%
35	28	1	3.6%	0.3	1.0%	0.3	1.0%
	101,536	13,482	13.3%	10,557.6	10.4%	10,557.6	10.4%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-12

Termination of Employment

Other Membership - Females (Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	-	-	0.0%	-	22.5%	-	22.5%
1	34,306	6,464	18.8%	6,859.0	20.0%	6,859.0	20.0%
2	78,139	10,990	14.1%	12,600.0	16.1%	12,600.0	16.1%
3	104,181	11,881	11.4%	13,738.9	13.2%	13,738.9	13.2%
4	123,674	12,086	9.8%	12,676.6	10.3%	12,676.6	10.3%
5	134,607	10,019	7.4%	11,239.7	8.4%	11,239.7	8.4%
6	141,227	9,154	6.5%	10,246.0	7.3%	10,246.0	7.3%
7	147,131	9,734	6.6%	9,798.9	6.7%	9,798.9	6.7%
8	147,086	9,554	6.5%	8,920.8	6.1%	8,920.8	6.1%
9	150,395	9,365	6.2%	8,226.6	5.5%	8,226.6	5.5%
10	151,315	8,037	5.3%	7,452.2	4.9%	7,452.2	4.9%
11	153,018	8,042	5.3%	6,702.2	4.4%	6,702.2	4.4%
12	164,400	6,342	3.9%	6,493.8	4.0%	6,493.8	4.0%
13	161,327	5,580	3.5%	5,894.5	3.7%	5,894.5	3.7%
14	151,904	5,879	3.9%	5,282.5	3.5%	5,282.5	3.5%
15	146,772	6,140	4.2%	4,933.4	3.4%	4,933.4	3.4%
16	143,292	4,808	3.4%	4,606.8	3.2%	4,606.8	3.2%
17	137,797	5,697	4.1%	4,228.6	3.1%	4,228.6	3.1%
18	141,936	4,904	3.5%	4,162.3	2.9%	4,162.3	2.9%
19	144,416	4,933	3.4%	4,038.2	2.8%	4,038.2	2.8%
20	139,543	2,914	2.1%	3,711.8	2.7%	3,711.8	2.7%
21	128,382	2,932	2.3%	3,240.1	2.5%	3,240.1	2.5%
22	120,469	1,782	1.5%	2,876.2	2.4%	2,876.2	2.4%
23	105,983	2,827	2.7%	2,385.9	2.3%	2,385.9	2.3%
24	90,782	1,294	1.4%	1,920.0	2.1%	1,920.0	2.1%
25	85,864	846	1.0%	1,699.0	2.0%	1,699.0	2.0%
26	74,417	681	0.9%	1,371.1	1.8%	1,371.1	1.8%
27	62,975	883	1.4%	1,074.5	1.7%	1,074.5	1.7%
28	56,992	916	1.6%	894.8	1.6%	894.8	1.6%
29	59,167	704	1.2%	848.3	1.4%	848.3	1.4%
30	50,832	498	1.0%	659.5	1.3%	659.5	1.3%
31	40,622	172	0.4%	436.7	1.1%	436.7	1.1%
32	29,425	173	0.6%	301.6	1.0%	301.6	1.0%
33	16,644	503	3.0%	170.6	1.0%	170.6	1.0%
34	11,614	198	1.7%	119.0	1.0%	119.0	1.0%
35	5,347	43	0.8%	54.8	1.0%	54.8	1.0%
	3,635,985	166,975	4.6%	169,865.2	4.7%	169,865.2	4.7%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-13

Termination of Employment

Sheriffs and Deputies Membership

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	62	6	9.7%	3.1	5.0%	5.0	8.0%
1	254	27	10.6%	10.2	4.0%	15.2	6.0%
2	264	16	6.1%	7.9	3.0%	13.2	5.0%
3	275	13	4.7%	5.5	2.0%	11.0	4.0%
4	282	11	3.9%	2.8	1.0%	8.5	3.0%
5	276	14	5.1%	2.8	1.0%	6.9	2.5%
6	259	20	7.7%	2.6	1.0%	5.2	2.0%
7	243	11	4.5%	2.4	1.0%	3.9	1.6%
8	222	11	5.0%	2.2	1.0%	3.1	1.4%
9	211	6	2.8%	2.1	1.0%	2.5	1.2%
10	224	6	2.7%	2.2	1.0%	2.6	1.2%
11	226	7	3.1%	2.3	1.0%	2.5	1.1%
12	232	7	3.0%	2.3	1.0%	2.4	1.1%
13	224	5	2.2%	2.2	1.0%	2.2	1.0%
14	219	2	0.9%	2.2	1.0%	2.2	1.0%
15	228	4	1.8%	2.3	1.0%	2.3	1.0%
16	212	5	2.4%	2.1	1.0%	2.1	1.0%
17	208	-	0.0%	2.1	1.0%	2.1	1.0%
18	213	2	0.9%	2.1	1.0%	2.1	1.0%
19	198	2	1.0%	2.0	1.0%	2.0	1.0%
20	203	3	1.5%	2.0	1.0%	2.0	1.0%
21	184	4	2.2%	1.8	1.0%	1.8	1.0%
22	129	2	1.6%	1.3	1.0%	1.3	1.0%
23	107	3	2.8%	1.1	1.0%	1.1	1.0%
24	97	1	1.0%	1.0	1.0%	1.0	1.0%
25	79	-	0.0%	0.8	1.0%	0.8	1.0%
26	54	-	0.0%	0.5	1.0%	0.5	1.0%
27	33	2	6.1%	0.3	1.0%	0.3	1.0%
28	14	-	0.0%	0.1	1.0%	0.1	1.0%
29	11	-	0.0%	0.1	1.0%	0.1	1.0%
30	2	-	0.0%	0.0	1.0%	0.0	1.0%
31	1	-	0.0%	0.0	1.0%	0.0	1.0%
32	-	-	0.0%	-	1.0%	-	1.0%
33	-	-	0.0%	-	1.0%	-	1.0%
34	-	-	0.0%	-	1.0%	-	1.0%
35	-	-	0.0%	-	1.0%	-	1.0%
	5,446	190	3.5%	72.6	1.9%	106.1	1.9%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-14

Termination of Employment

Sheriffs and Deputies Membership (Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	-	-	0.0%	-	5.0%	-	8.0%
1	936	86	9.2%	37.5	4.0%	56.2	6.0%
2	2,932	151	5.2%	88.0	3.0%	146.6	5.0%
3	4,844	208	4.3%	96.9	2.0%	193.8	4.0%
4	6,880	210	3.1%	68.8	1.0%	206.4	3.0%
5	8,749	431	4.9%	87.5	1.0%	218.7	2.5%
6	9,810	645	6.6%	98.1	1.0%	196.2	2.0%
7	11,044	480	4.3%	110.4	1.0%	176.7	1.6%
8	11,675	453	3.9%	116.8	1.0%	163.5	1.4%
9	12,693	232	1.8%	126.9	1.0%	152.3	1.2%
10	15,253	318	2.1%	152.5	1.0%	175.4	1.2%
11	17,006	508	3.0%	170.1	1.0%	187.1	1.1%
12	19,348	394	2.0%	193.5	1.0%	203.2	1.1%
13	20,305	344	1.7%	203.1	1.0%	203.1	1.0%
14	21,416	157	0.7%	214.2	1.0%	214.2	1.0%
15	24,004	369	1.5%	240.0	1.0%	240.0	1.0%
16	24,380	393	1.6%	243.8	1.0%	243.8	1.0%
17	25,849	-	0.0%	258.5	1.0%	258.5	1.0%
18	28,057	113	0.4%	280.6	1.0%	280.6	1.0%
19	28,449	296	1.0%	284.5	1.0%	284.5	1.0%
20	30,622	400	1.3%	306.2	1.0%	306.2	1.0%
21	29,771	619	2.1%	297.7	1.0%	297.7	1.0%
22	22,224	294	1.3%	222.2	1.0%	222.2	1.0%
23	18,610	431	2.3%	186.1	1.0%	186.1	1.0%
24	18,081	154	0.9%	180.8	1.0%	180.8	1.0%
25	15,543	-	0.0%	155.4	1.0%	155.4	1.0%
26	10,985	-	0.0%	109.8	1.0%	109.8	1.0%
27	6,728	315	4.7%	67.3	1.0%	67.3	1.0%
28	2,888	-	0.0%	28.9	1.0%	28.9	1.0%
29	2,442	-	0.0%	24.4	1.0%	24.4	1.0%
30	350	-	0.0%	3.5	1.0%	3.5	1.0%
31	183	-	0.0%	1.8	1.0%	1.8	1.0%
32	-	-	0.0%	-	1.0%	-	1.0%
33	-	-	0.0%	-	1.0%	-	1.0%
34	-	-	0.0%	-	1.0%	-	1.0%
35	-	-	0.0%	-	1.0%	-	1.0%
	452,058	8,003	1.8%	4,655.8	1.2%	5,384.9	1.2%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-15

Termination of Employment

Protecion Occupations Membership

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	792	145	18.3%	103.0	13.0%	103.0	13.0%
1	2,810	531	18.9%	281.0	10.0%	323.2	11.5%
2	2,209	346	15.7%	198.8	9.0%	220.9	10.0%
3	1,730	208	12.0%	138.4	8.0%	151.4	8.8%
4	1,483	168	11.3%	107.5	7.3%	111.2	7.5%
5	1,284	114	8.9%	83.5	6.5%	83.5	6.5%
6	1,091	90	8.2%	62.7	5.8%	62.7	5.8%
7	997	85	8.5%	49.9	5.0%	52.3	5.3%
8	818	67	8.2%	36.8	4.5%	38.9	4.8%
9	863	57	6.6%	34.5	4.0%	36.7	4.3%
10	923	56	6.1%	32.3	3.5%	34.6	3.8%
11	862	43	5.0%	25.9	3.0%	28.0	3.3%
12	883	41	4.6%	24.3	2.8%	26.5	3.0%
13	774	33	4.3%	19.4	2.5%	21.3	2.8%
14	640	26	4.1%	15.0	2.4%	16.0	2.5%
15	594	22	3.7%	13.1	2.2%	14.0	2.4%
16	502	19	3.8%	10.3	2.1%	11.0	2.2%
17	502	22	4.4%	9.5	1.9%	10.3	2.1%
18	520	14	2.7%	9.1	1.8%	9.9	1.9%
19	524	15	2.9%	8.4	1.6%	9.2	1.8%
20	553	15	2.7%	8.0	1.5%	8.8	1.6%
21	496	13	2.6%	6.4	1.3%	7.2	1.5%
22	420	10	2.4%	4.8	1.2%	5.3	1.3%
23	360	12	3.3%	3.6	1.0%	4.5	1.3%
24	270	9	3.3%	2.7	1.0%	3.4	1.3%
25	246	6	2.4%	2.5	1.0%	3.1	1.3%
26	195	9	4.6%	2.0	1.0%	2.4	1.3%
27	176	4	2.3%	1.8	1.0%	2.2	1.3%
28	158	2	1.3%	1.6	1.0%	2.0	1.3%
29	135	1	0.7%	1.4	1.0%	1.7	1.3%
30	115	3	2.6%	1.2	1.0%	1.4	1.3%
31	83	1	1.2%	0.8	1.0%	1.0	1.3%
32	52	-	0.0%	0.5	1.0%	0.7	1.3%
33	27	1	3.7%	0.3	1.0%	0.3	1.3%
34	11	-	0.0%	0.1	1.0%	0.1	1.3%
35	3	-	0.0%	0.0	1.0%	0.0	1.3%
	24,101	2,188	9.1%	1,300.9	5.8%	1,408.6	5.8%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary H-16

Termination of Employment

Protecion Occupations Membership (Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
0	-	-	0.0%	-	13.0%	-	13.0%
1	7,154	1,131	15.8%	715.4	10.0%	822.8	11.5%
2	16,855	2,213	13.1%	1,517.0	9.0%	1,685.5	10.0%
3	21,216	2,036	9.6%	1,697.3	8.0%	1,856.4	8.8%
4	25,421	2,282	9.0%	1,843.0	7.3%	1,906.6	7.5%
5	28,592	1,707	6.0%	1,858.5	6.5%	1,858.5	6.5%
6	30,458	1,748	5.7%	1,751.3	5.8%	1,751.3	5.8%
7	34,507	2,169	6.3%	1,725.4	5.0%	1,811.6	5.3%
8	33,163	2,091	6.3%	1,492.3	4.5%	1,575.2	4.8%
9	40,405	1,726	4.3%	1,616.2	4.0%	1,717.2	4.3%
10	51,051	2,432	4.8%	1,786.8	3.5%	1,914.4	3.8%
11	53,426	1,989	3.7%	1,602.8	3.0%	1,736.3	3.3%
12	62,551	1,974	3.2%	1,720.2	2.8%	1,876.5	3.0%
13	58,483	1,806	3.1%	1,462.1	2.5%	1,608.3	2.8%
14	52,362	1,317	2.5%	1,230.5	2.4%	1,309.1	2.5%
15	52,356	1,627	3.1%	1,151.8	2.2%	1,230.4	2.4%
16	47,490	1,181	2.5%	973.6	2.1%	1,044.8	2.2%
17	51,655	1,786	3.5%	981.4	1.9%	1,058.9	2.1%
18	57,118	1,084	1.9%	999.6	1.8%	1,085.2	1.9%
19	60,838	1,230	2.0%	973.4	1.6%	1,064.7	1.8%
20	70,284	1,025	1.5%	1,019.1	1.5%	1,124.6	1.6%
21	67,380	1,435	2.1%	875.9	1.3%	977.0	1.5%
22	60,359	1,444	2.4%	694.1	1.2%	754.5	1.3%
23	53,840	1,611	3.0%	538.4	1.0%	673.0	1.3%
24	42,130	1,001	2.4%	421.3	1.0%	526.6	1.3%
25	41,322	973	2.4%	413.2	1.0%	516.5	1.3%
26	34,588	1,256	3.6%	345.9	1.0%	432.4	1.3%
27	32,107	753	2.3%	321.1	1.0%	401.3	1.3%
28	30,612	215	0.7%	306.1	1.0%	382.6	1.3%
29	27,675	180	0.7%	276.8	1.0%	345.9	1.3%
30	23,728	431	1.8%	237.3	1.0%	296.6	1.3%
31	18,523	311	1.7%	185.2	1.0%	231.5	1.3%
32	11,648	-	0.0%	116.5	1.0%	145.6	1.3%
33	6,121	214	3.5%	61.2	1.0%	76.5	1.3%
34	2,483	-	0.0%	24.8	1.0%	31.0	1.3%
35	732	-	0.0%	7.3	1.0%	9.1	1.3%
	1,308,635	44,378	3.4%	32,942.9	2.7%	35,838.7	2.7%

APPENDIX I

PROBABILITY OF ELECTING A VESTED BENEFIT

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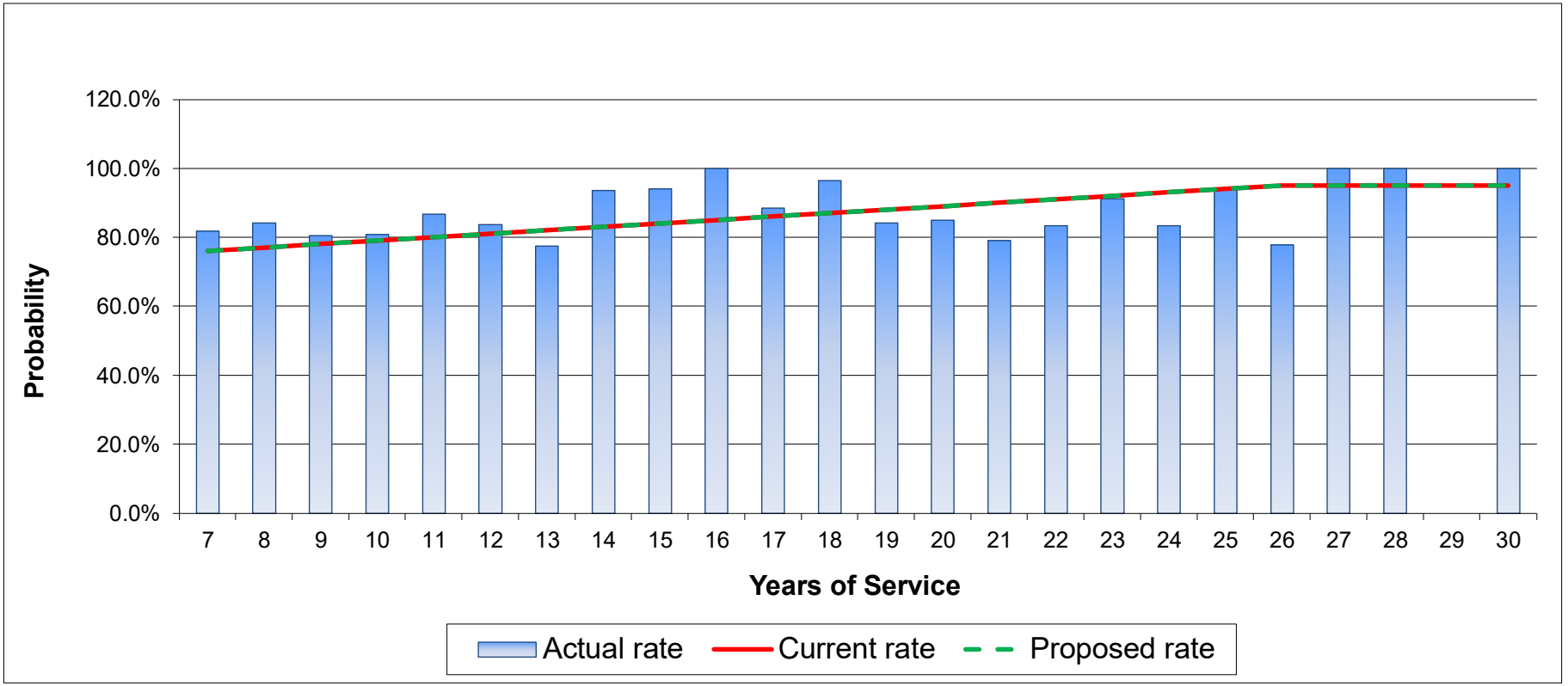
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-1

Probability of Electing a Vested Benefit

School Membership - Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	744	716	716
Actual/Expected		104%	104%

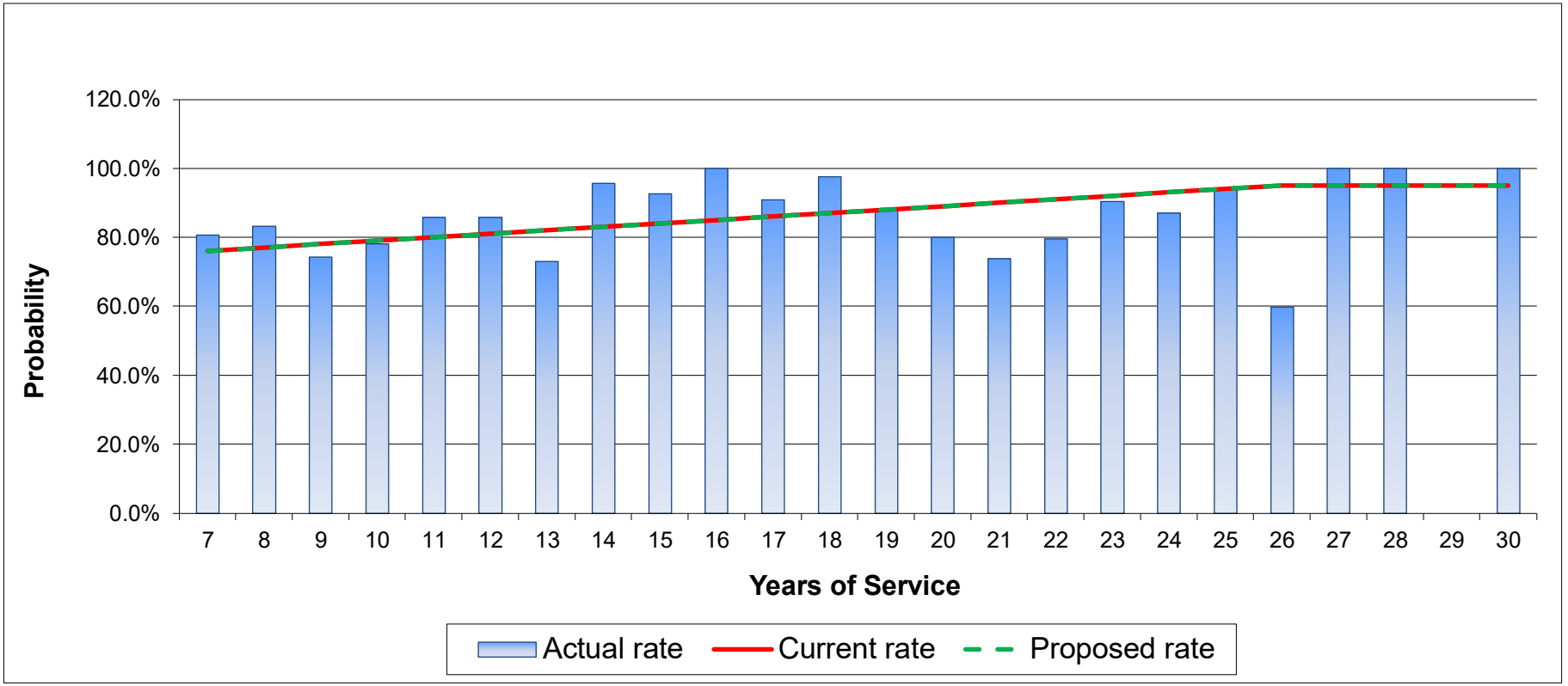
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-2

Probability of Electing a Vested Benefit

School Membership - Males (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	47,270	47,875	47,875
Actual/Expected		99%	99%

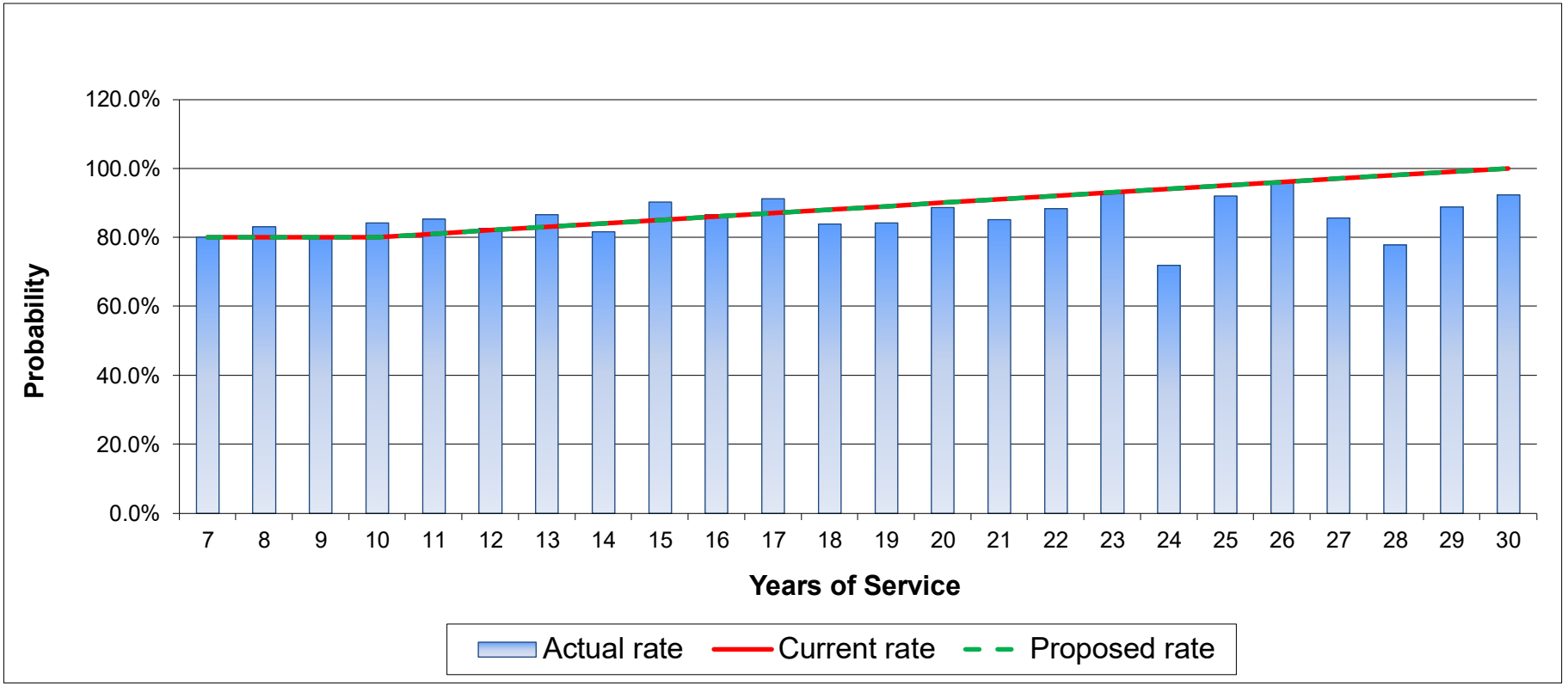
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-3

Probability of Electing a Vested Benefit

School Membership - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	3,014	2,971	2,971
Actual/Expected		101%	101%

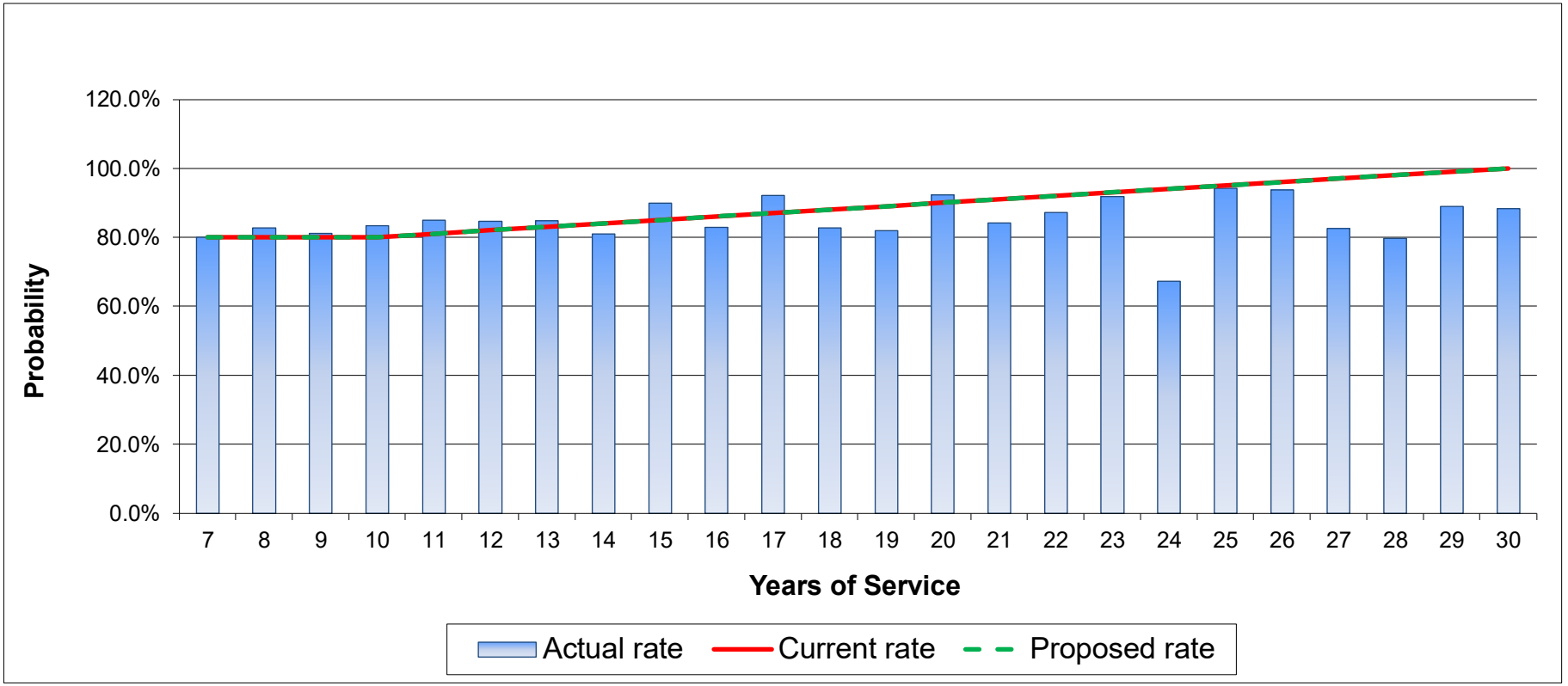
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-4

Probability of Electing a Vested Benefit

School Membership - Females (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	125,362	126,423	126,423
Actual/Expected		99%	99%

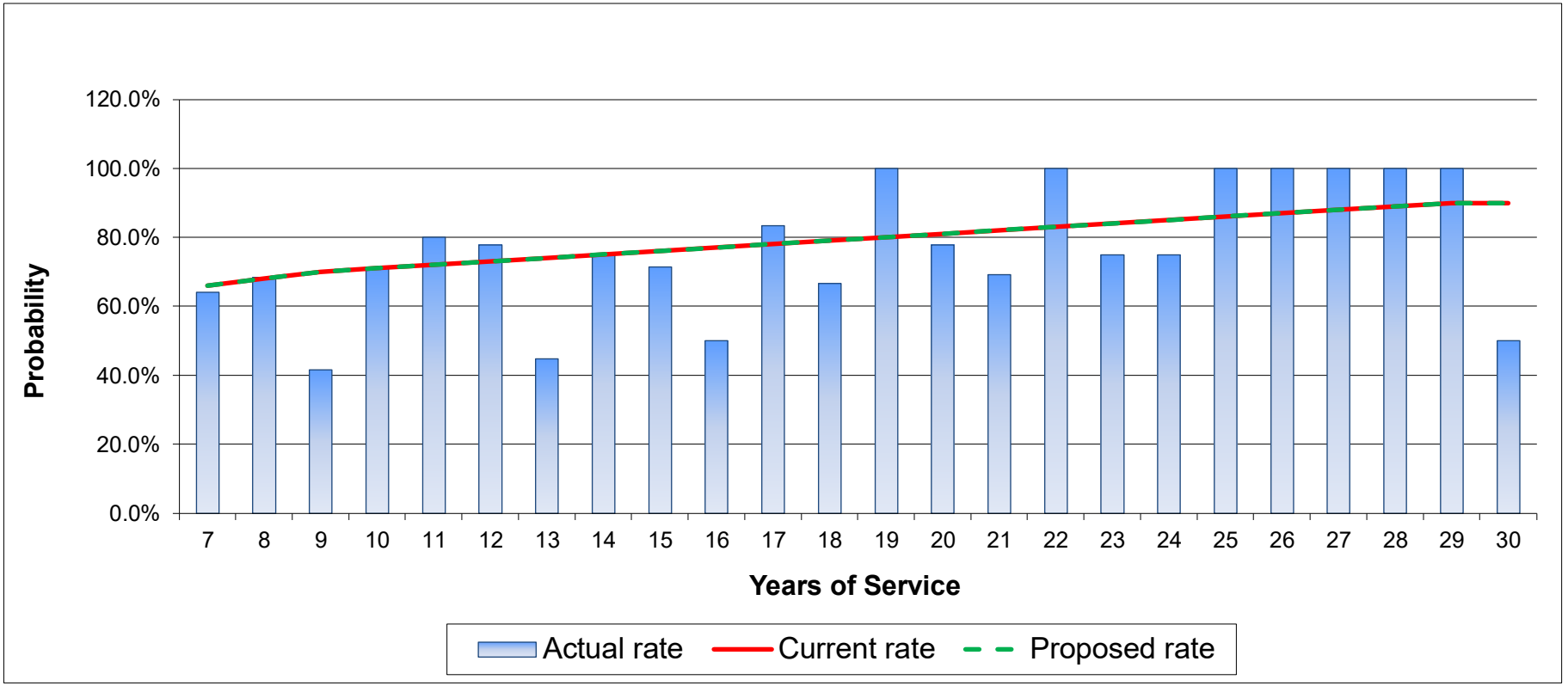
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-5

Probability of Electing a Vested Benefit

State Membership - Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	228	246	246
Actual/Expected		93%	93%

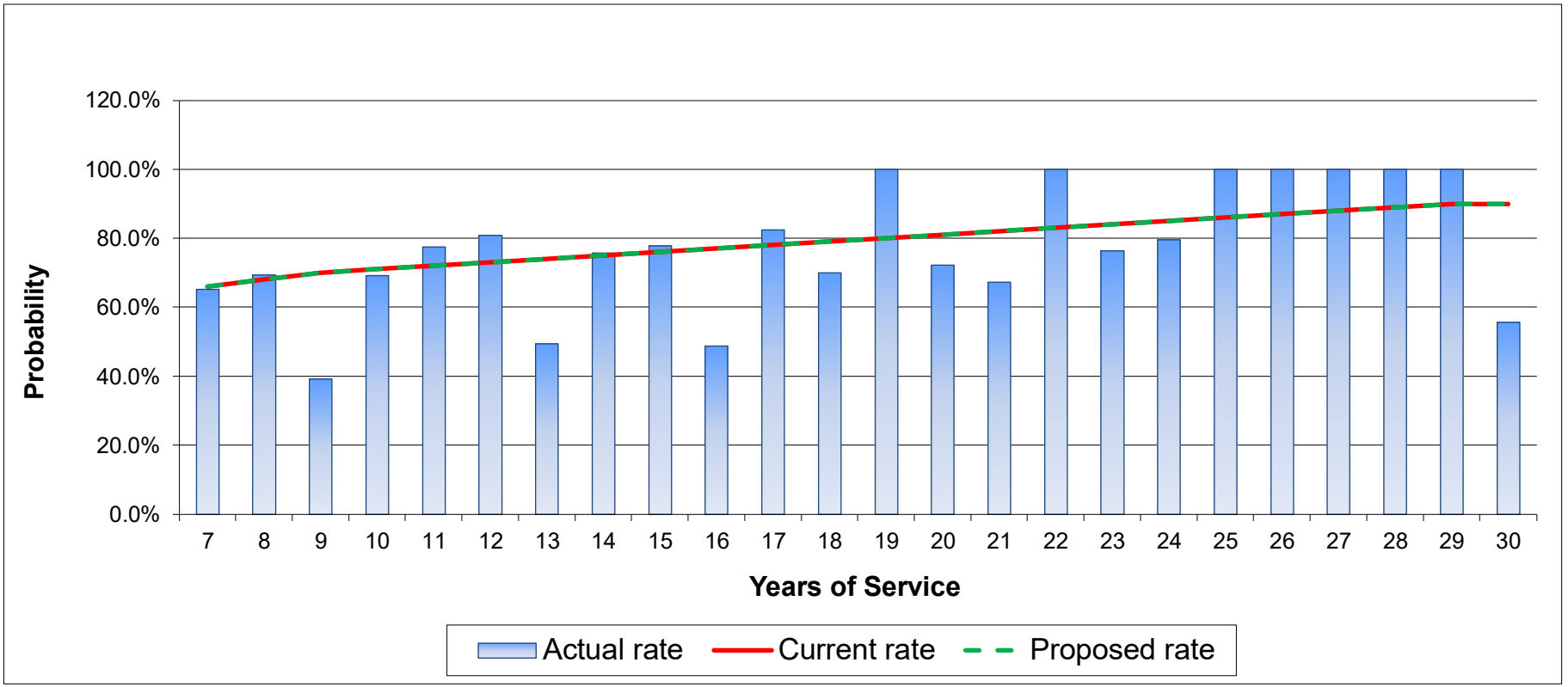
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-6

Probability of Electing a Vested Benefit

State Membership - Males (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	19,995	21,305	21,305
Actual/Expected		94%	94%

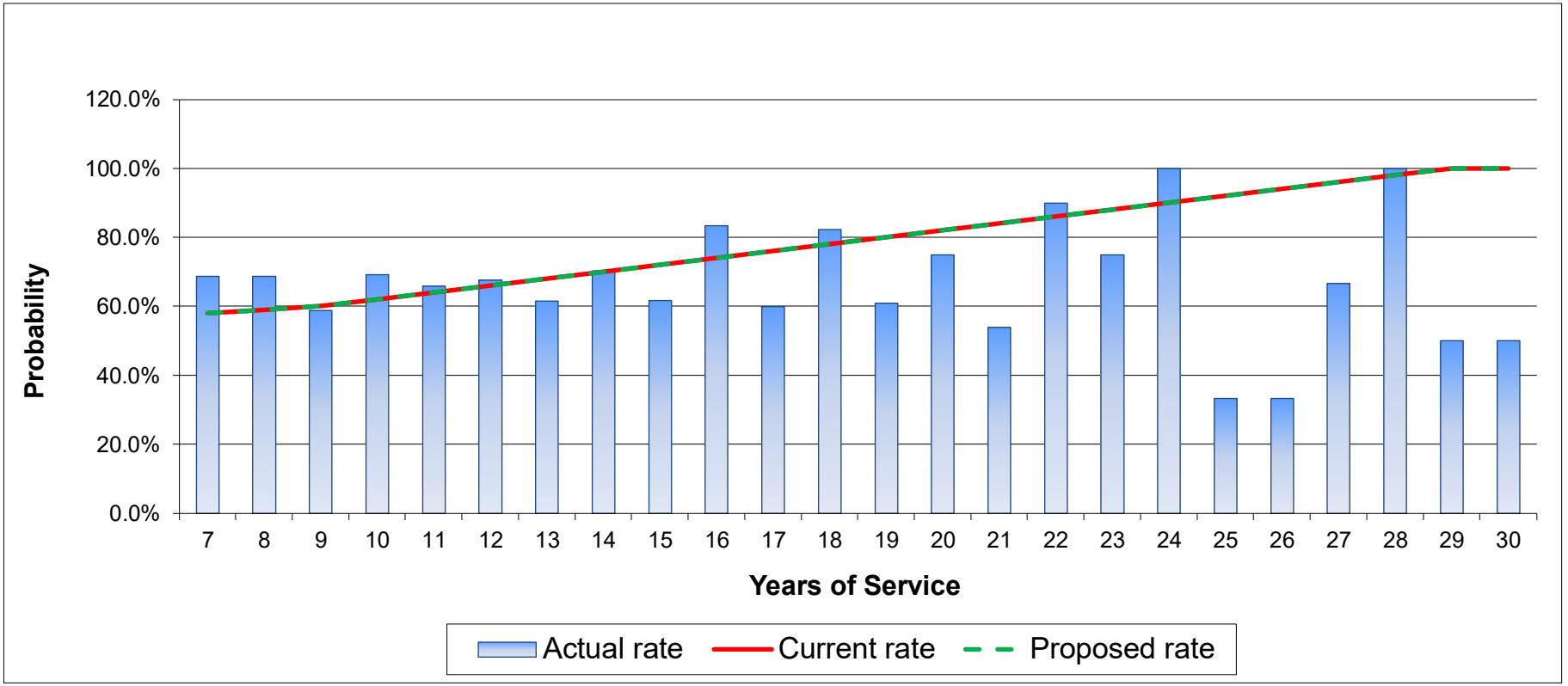
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-7

Probability of Electing a Vested Benefit

State Membership - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	378	384	384
Actual/Expected		98%	98%

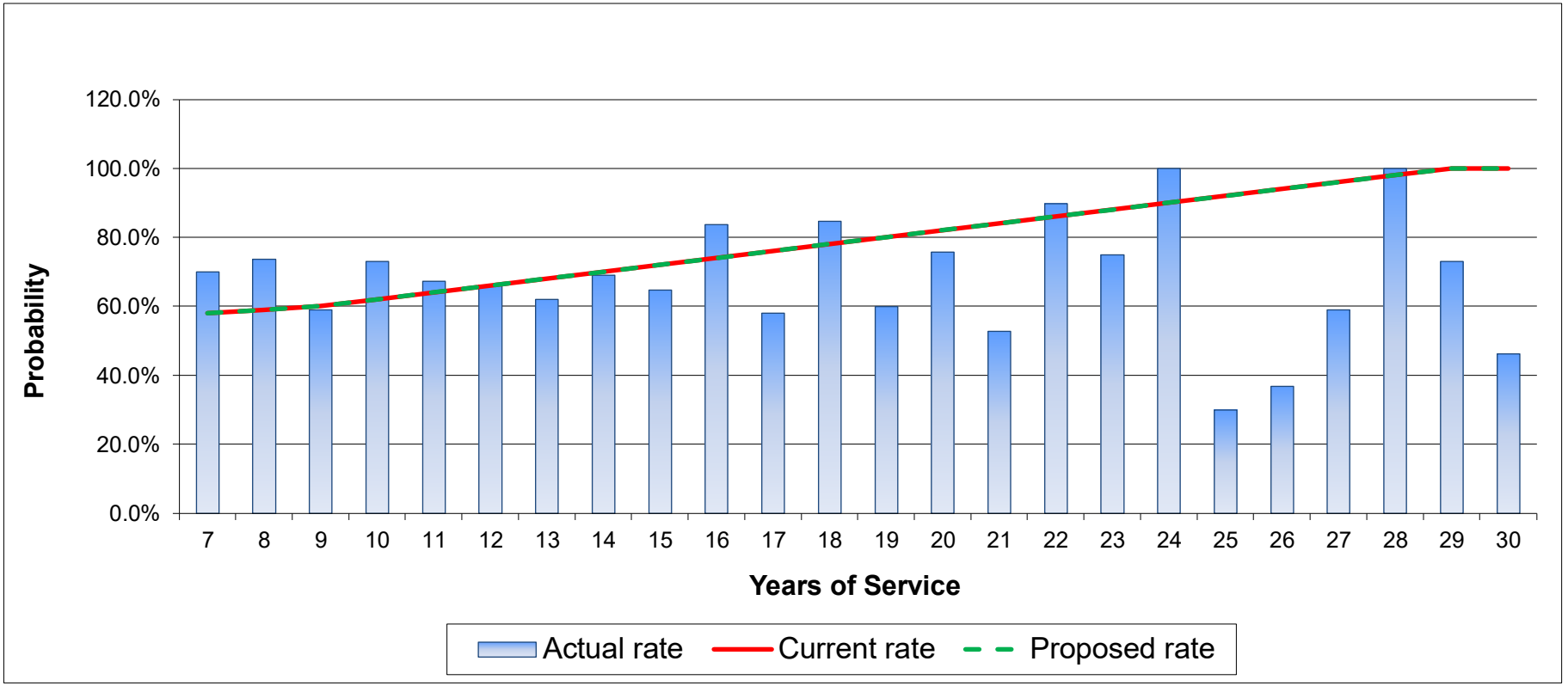
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-8

Probability of Electing a Vested Benefit

State Membership - Females (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	29,126	31,076	31,076
Actual/Expected		94%	94%

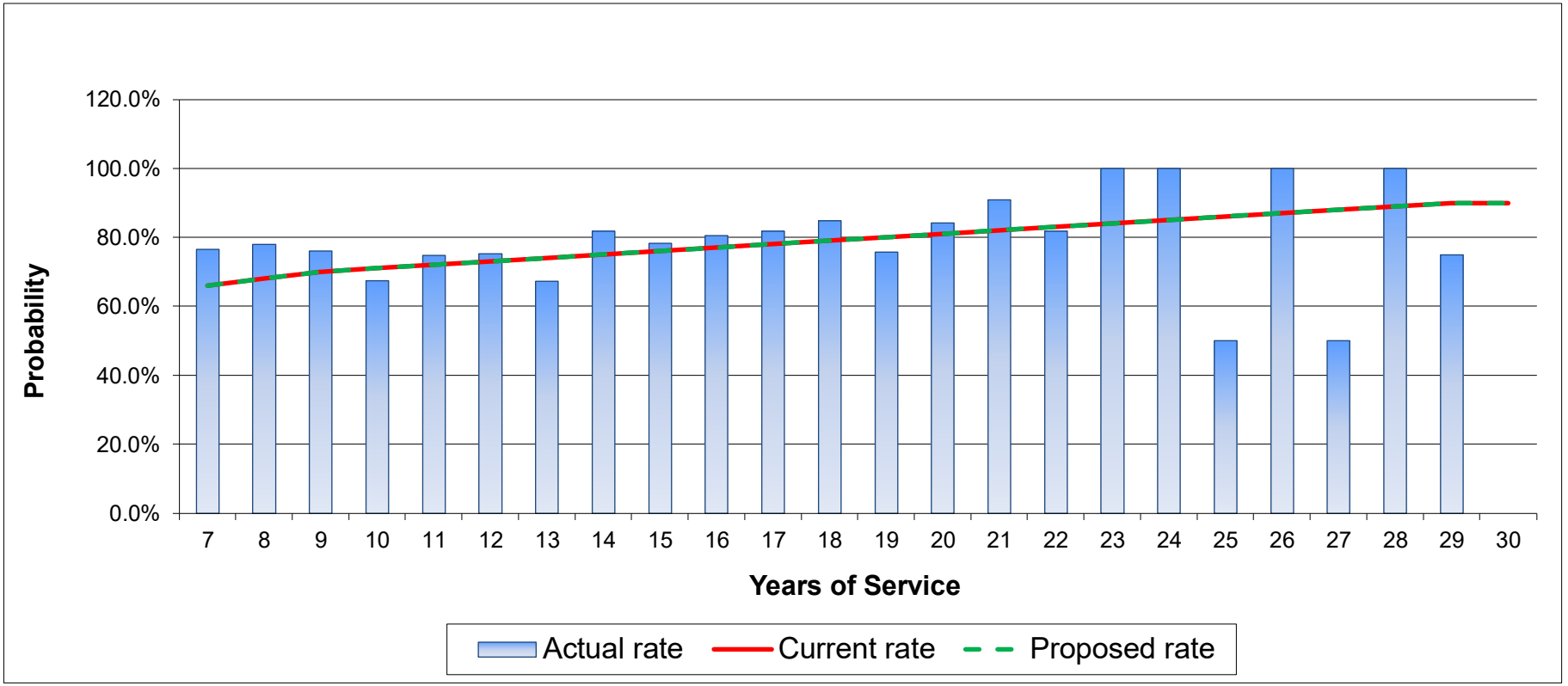
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-9

Probability of Electing a Vested Benefit

Other Membership - Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	833	785	785
Actual/Expected		106%	106%

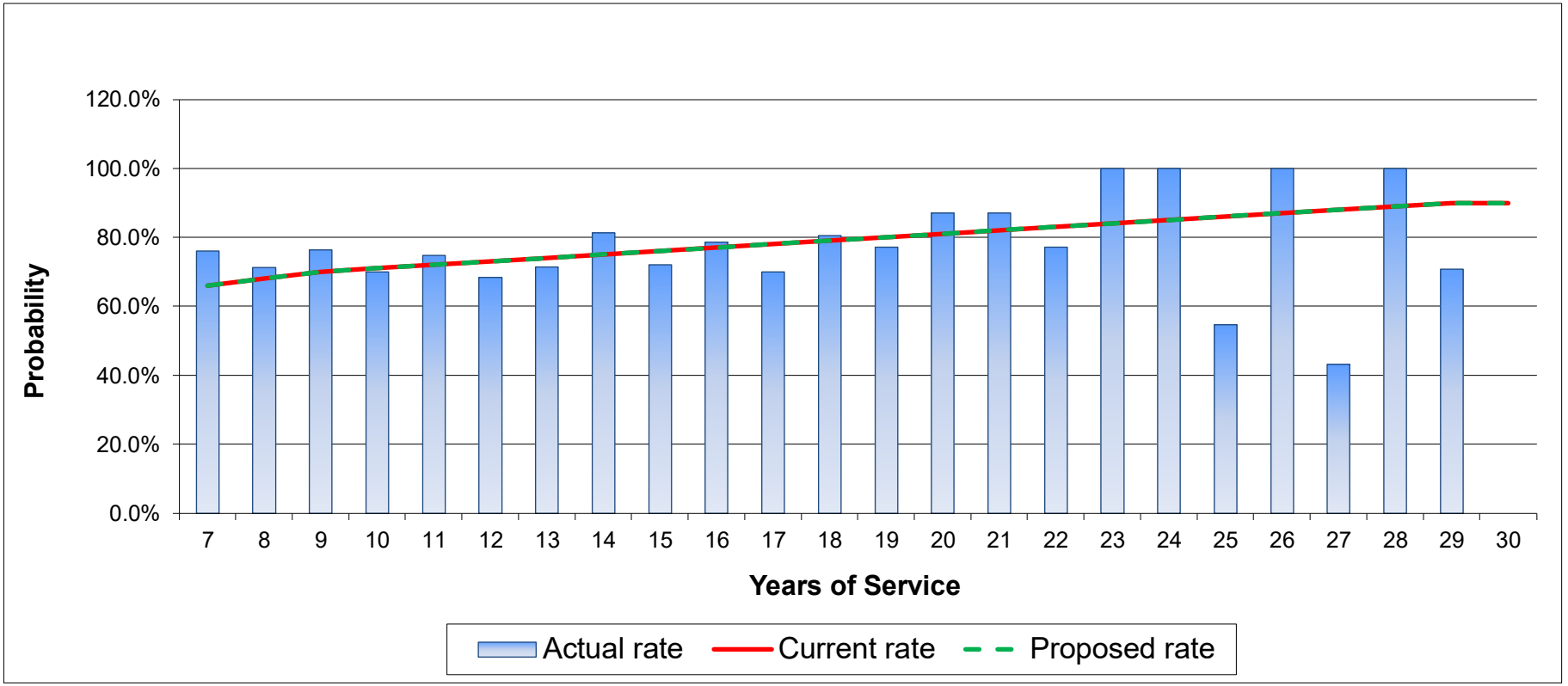
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-10

Probability of Electing a Vested Benefit

Other Membership - Males (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	46,846	46,456	46,456
Actual/Expected		101%	101%

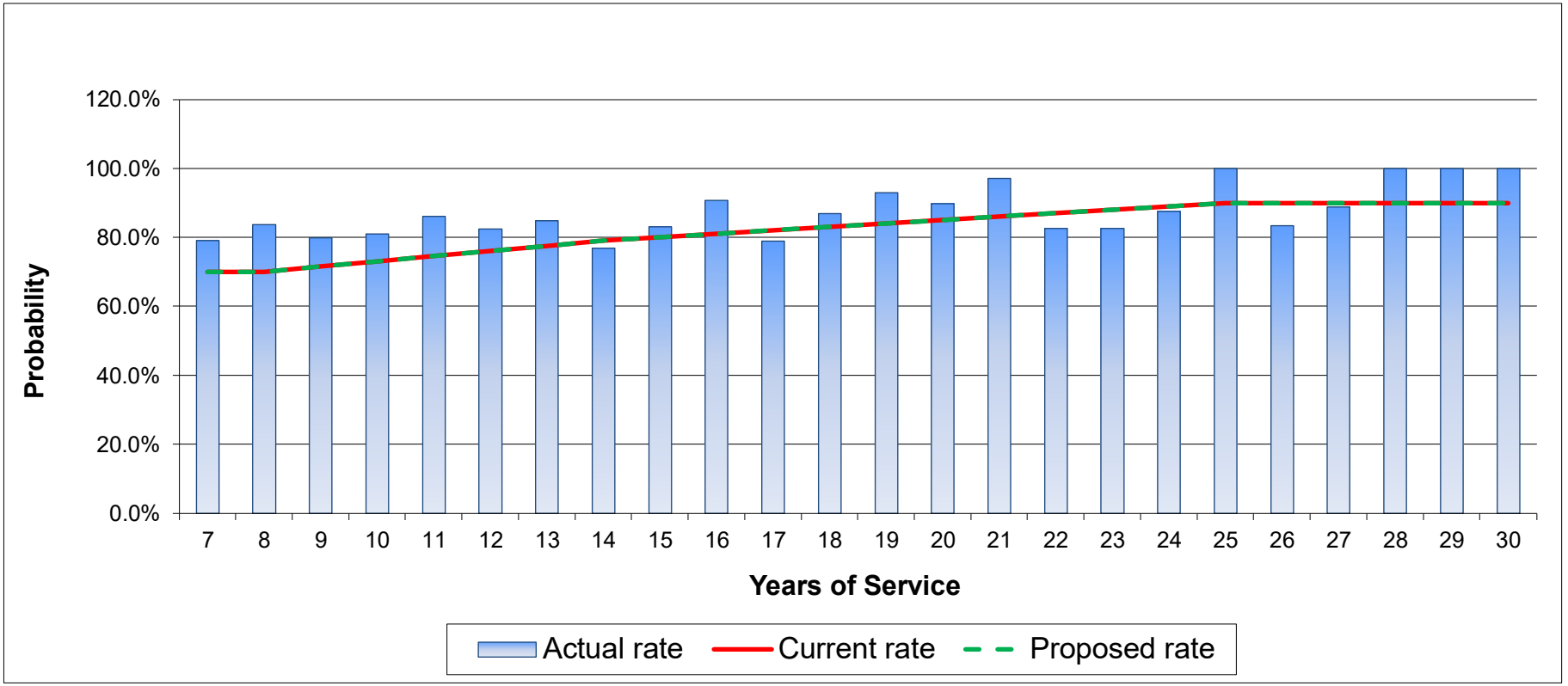
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-11

Probability of Electing a Vested Benefit

Other Membership - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,933	1,752	1,752
Actual/Expected		110%	110%

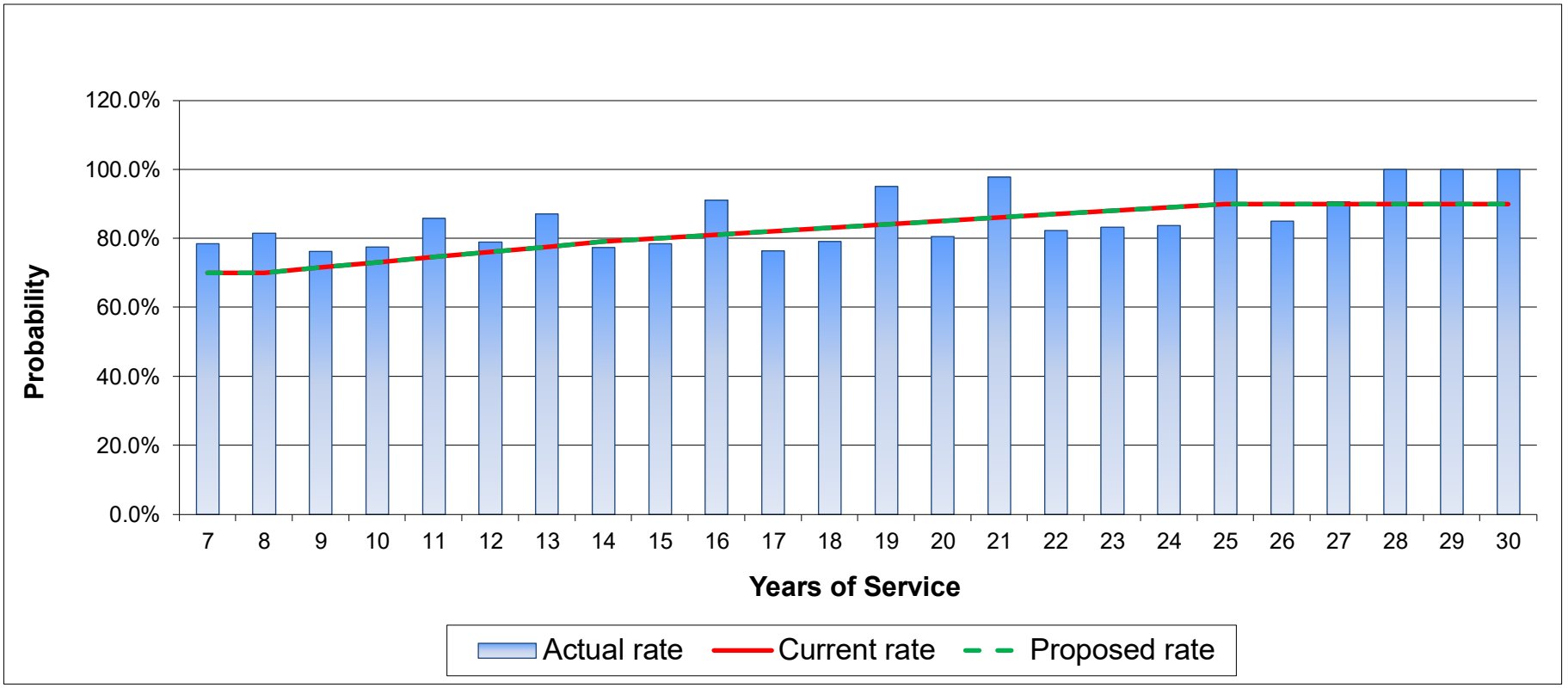
Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Exhibit I-12

Probability of Electing a Vested Benefit

Other Membership - Females (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	86,678	81,800	81,800
Actual/Expected		106%	106%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-1

Probability of Electing a Vested Benefit

School Membership - Males

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					73.0%		73.0%
5					74.0%		74.0%
6					75.0%		75.0%
7	143	117	81.8%	108.7	76.0%	108.7	76.0%
8	108	91	84.3%	83.2	77.0%	83.2	77.0%
9	77	62	80.5%	60.1	78.0%	60.1	78.0%
10	73	59	80.8%	57.7	79.0%	57.7	79.0%
11	68	59	86.8%	54.4	80.0%	54.4	80.0%
12	49	41	83.7%	39.7	81.0%	39.7	81.0%
13	58	45	77.6%	47.6	82.0%	47.6	82.0%
14	31	29	93.5%	25.7	83.0%	25.7	83.0%
15	34	32	94.1%	28.6	84.0%	28.6	84.0%
16	32	32	100.0%	27.2	85.0%	27.2	85.0%
17	26	23	88.5%	22.4	86.0%	22.4	86.0%
18	28	27	96.4%	24.4	87.0%	24.4	87.0%
19	19	16	84.2%	16.7	88.0%	16.7	88.0%
20	20	17	85.0%	17.8	89.0%	17.8	89.0%
21	24	19	79.2%	21.6	90.0%	21.6	90.0%
22	12	10	83.3%	10.9	91.0%	10.9	91.0%
23	23	21	91.3%	21.2	92.0%	21.2	92.0%
24	12	10	83.3%	11.2	93.0%	11.2	93.0%
25	16	15	93.8%	15.0	94.0%	15.0	94.0%
26	9	7	77.8%	8.6	95.0%	8.6	95.0%
27	5	5	100.0%	4.8	95.0%	4.8	95.0%
28	4	4	100.0%	3.8	95.0%	3.8	95.0%
29	2	-	0.0%	1.9	95.0%	1.9	95.0%
30	3	3	100.0%	2.9	95.0%	2.9	95.0%
	876	744	84.9%	715.7	81.7%	715.7	81.7%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-2

Probability of Electing a Vested Benefit

School Membership - Males (Weighted)

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					73.0%		73.0%
5					74.0%		74.0%
6					75.0%		75.0%
7	3,437	2,773	80.7%	2,612.3	76.0%	2,612.3	76.0%
8	3,644	3,032	83.2%	2,805.6	77.0%	2,805.6	77.0%
9	2,604	1,933	74.2%	2,030.9	78.0%	2,030.9	78.0%
10	2,917	2,281	78.2%	2,304.4	79.0%	2,304.4	79.0%
11	2,947	2,528	85.8%	2,357.4	80.0%	2,357.4	80.0%
12	2,989	2,562	85.7%	2,420.9	81.0%	2,420.9	81.0%
13	3,576	2,613	73.1%	2,932.2	82.0%	2,932.2	82.0%
14	2,008	1,923	95.8%	1,666.3	83.0%	1,666.3	83.0%
15	2,202	2,042	92.7%	1,849.4	84.0%	1,849.4	84.0%
16	2,534	2,534	100.0%	2,153.9	85.0%	2,153.9	85.0%
17	2,417	2,197	90.9%	2,078.6	86.0%	2,078.6	86.0%
18	2,014	1,966	97.6%	1,752.1	87.0%	1,752.1	87.0%
19	1,839	1,620	88.1%	1,618.3	88.0%	1,618.3	88.0%
20	2,544	2,037	80.1%	2,264.4	89.0%	2,264.4	89.0%
21	3,194	2,360	73.9%	2,874.2	90.0%	2,874.2	90.0%
22	1,683	1,339	79.6%	1,531.3	91.0%	1,531.3	91.0%
23	3,127	2,830	90.5%	2,877.3	92.0%	2,877.3	92.0%
24	2,009	1,749	87.1%	1,868.1	93.0%	1,868.1	93.0%
25	2,862	2,698	94.3%	2,690.5	94.0%	2,690.5	94.0%
26	1,558	931	59.7%	1,480.4	95.0%	1,480.4	95.0%
27	1,342	1,342	100.0%	1,274.8	95.0%	1,274.8	95.0%
28	1,203	1,203	100.0%	1,143.1	95.0%	1,143.1	95.0%
29	581	-	0.0%	551.7	95.0%	551.7	95.0%
30	776	776	100.0%	737.3	95.0%	737.3	95.0%
	56,005	47,270	84.4%	47,875.2	85.5%	47,875.2	85.5%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-3

Probability of Electing a Vested Benefit

School Membership - Females

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					80.0%		80.0%
5					80.0%		80.0%
6					80.0%		80.0%
7	579	464	80.1%	463.2	80.0%	463.2	80.0%
8	477	396	83.0%	381.6	80.0%	381.6	80.0%
9	311	250	80.4%	248.8	80.0%	248.8	80.0%
10	372	313	84.1%	297.6	80.0%	297.6	80.0%
11	356	304	85.4%	288.4	81.0%	288.4	81.0%
12	270	223	82.6%	221.4	82.0%	221.4	82.0%
13	217	188	86.6%	180.1	83.0%	180.1	83.0%
14	164	134	81.7%	137.8	84.0%	137.8	84.0%
15	155	140	90.3%	131.8	85.0%	131.8	85.0%
16	127	110	86.6%	109.2	86.0%	109.2	86.0%
17	91	83	91.2%	79.2	87.0%	79.2	87.0%
18	93	78	83.9%	81.8	88.0%	81.8	88.0%
19	70	59	84.3%	62.3	89.0%	62.3	89.0%
20	71	63	88.7%	63.9	90.0%	63.9	90.0%
21	54	46	85.2%	49.1	91.0%	49.1	91.0%
22	43	38	88.4%	39.6	92.0%	39.6	92.0%
23	30	28	93.3%	27.9	93.0%	27.9	93.0%
24	25	18	72.0%	23.5	94.0%	23.5	94.0%
25	25	23	92.0%	23.8	95.0%	23.8	95.0%
26	24	23	95.8%	23.0	96.0%	23.0	96.0%
27	7	6	85.7%	6.8	97.0%	6.8	97.0%
28	9	7	77.8%	8.8	98.0%	8.8	98.0%
29	9	8	88.9%	8.9	99.0%	8.9	99.0%
30	13	12	92.3%	13.0	100.0%	13.0	100.0%
	3,592	3,014	83.9%	2,971.4	82.7%	2,971.4	82.7%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-4

Probability of Electing a Vested Benefit

School Membership - Females (Weighted)

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					80.0%		80.0%
5					80.0%		80.0%
6					80.0%		80.0%
7	10,387	8,315	80.1%	8,309.5	80.0%	8,309.5	80.0%
8	10,770	8,917	82.8%	8,616.0	80.0%	8,616.0	80.0%
9	8,063	6,540	81.1%	6,450.2	80.0%	6,450.2	80.0%
10	10,562	8,805	83.4%	8,450.0	80.0%	8,450.0	80.0%
11	12,556	10,682	85.1%	10,170.6	81.0%	10,170.6	81.0%
12	9,948	8,422	84.7%	8,157.4	82.0%	8,157.4	82.0%
13	9,680	8,209	84.8%	8,034.1	83.0%	8,034.1	83.0%
14	8,366	6,779	81.0%	7,027.4	84.0%	7,027.4	84.0%
15	8,068	7,262	90.0%	6,858.2	85.0%	6,858.2	85.0%
16	7,637	6,330	82.9%	6,568.0	86.0%	6,568.0	86.0%
17	5,525	5,097	92.3%	4,806.7	87.0%	4,806.7	87.0%
18	6,645	5,505	82.8%	5,847.9	88.0%	5,847.9	88.0%
19	5,170	4,241	82.0%	4,601.5	89.0%	4,601.5	89.0%
20	5,916	5,462	92.3%	5,324.4	90.0%	5,324.4	90.0%
21	4,401	3,705	84.2%	4,005.1	91.0%	4,005.1	91.0%
22	4,200	3,666	87.3%	3,863.8	92.0%	3,863.8	92.0%
23	3,612	3,320	91.9%	3,359.0	93.0%	3,359.0	93.0%
24	3,574	2,406	67.3%	3,359.3	94.0%	3,359.3	94.0%
25	3,648	3,440	94.3%	3,465.6	95.0%	3,465.6	95.0%
26	3,085	2,894	93.8%	2,961.3	96.0%	2,961.3	96.0%
27	987	814	82.5%	957.0	97.0%	957.0	97.0%
28	1,411	1,124	79.7%	1,382.3	98.0%	1,382.3	98.0%
29	1,886	1,678	89.0%	1,867.6	99.0%	1,867.6	99.0%
30	1,981	1,749	88.3%	1,980.6	100.0%	1,980.6	100.0%
	148,078	125,362	84.7%	126,423	85.4%	126,423	85.4%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-5

Probability of Electing a Vested Benefit

State Membership - Males

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					60.0%		60.0%
5					62.0%		62.0%
6					64.0%		64.0%
7	53	34	64.2%	35.0	66.0%	35.0	66.0%
8	38	26	68.4%	25.8	68.0%	25.8	68.0%
9	24	10	41.7%	16.8	70.0%	16.8	70.0%
10	31	22	71.0%	22.0	71.0%	22.0	71.0%
11	30	24	80.0%	21.6	72.0%	21.6	72.0%
12	27	21	77.8%	19.7	73.0%	19.7	73.0%
13	29	13	44.8%	21.5	74.0%	21.5	74.0%
14	8	6	75.0%	6.0	75.0%	6.0	75.0%
15	7	5	71.4%	5.3	76.0%	5.3	76.0%
16	10	5	50.0%	7.7	77.0%	7.7	77.0%
17	12	10	83.3%	9.4	78.0%	9.4	78.0%
18	15	10	66.7%	11.9	79.0%	11.9	79.0%
19	5	5	100.0%	4.0	80.0%	4.0	80.0%
20	9	7	77.8%	7.3	81.0%	7.3	81.0%
21	13	9	69.2%	10.7	82.0%	10.7	82.0%
22	5	5	100.0%	4.2	83.0%	4.2	83.0%
23	8	6	75.0%	6.7	84.0%	6.7	84.0%
24	4	3	75.0%	3.4	85.0%	3.4	85.0%
25	1	1	100.0%	0.9	86.0%	0.9	86.0%
26	2	2	100.0%	1.7	87.0%	1.7	87.0%
27	1	1	100.0%	0.9	88.0%	0.9	88.0%
28	1	1	100.0%	0.9	89.0%	0.9	89.0%
29	1	1	100.0%	0.9	90.0%	0.9	90.0%
30	2	1	50.0%	1.8	90.0%	1.8	90.0%
	336	228	67.9%	245.9	73.2%	245.9	73.2%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-6

Probability of Electing a Vested Benefit

State Membership - Males (Weighted)

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					60.0%		60.0%
5					62.0%		62.0%
6					64.0%		64.0%
7	2,147	1,399	65.2%	1,417.1	66.0%	1,417.1	66.0%
8	1,810	1,256	69.4%	1,230.5	68.0%	1,230.5	68.0%
9	1,350	529	39.2%	945.1	70.0%	945.1	70.0%
10	1,762	1,219	69.2%	1,251.2	71.0%	1,251.2	71.0%
11	2,482	1,924	77.5%	1,787.0	72.0%	1,787.0	72.0%
12	1,915	1,549	80.9%	1,398.2	73.0%	1,398.2	73.0%
13	2,407	1,191	49.5%	1,781.4	74.0%	1,781.4	74.0%
14	623	473	75.8%	467.6	75.0%	467.6	75.0%
15	552	429	77.8%	419.3	76.0%	419.3	76.0%
16	874	426	48.8%	673.1	77.0%	673.1	77.0%
17	1,411	1,163	82.4%	1,100.7	78.0%	1,100.7	78.0%
18	2,125	1,488	70.0%	1,678.6	79.0%	1,678.6	79.0%
19	878	878	100.0%	702.2	80.0%	702.2	80.0%
20	1,345	973	72.3%	1,089.6	81.0%	1,089.6	81.0%
21	1,851	1,244	67.2%	1,517.6	82.0%	1,517.6	82.0%
22	862	862	100.0%	715.8	83.0%	715.8	83.0%
23	1,151	880	76.5%	966.5	84.0%	966.5	84.0%
24	737	586	79.5%	626.4	85.0%	626.4	85.0%
25	94	94	100.0%	81.0	86.0%	81.0	86.0%
26	498	498	100.0%	433.4	87.0%	433.4	87.0%
27	168	168	100.0%	147.9	88.0%	147.9	88.0%
28	222	222	100.0%	197.3	89.0%	197.3	89.0%
29	282	282	100.0%	254.1	90.0%	254.1	90.0%
30	470	261	55.6%	422.8	90.0%	422.8	90.0%
	28,017	19,995	71.4%	21,304.5	76.0%	21,304.5	76.0%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-7

Probability of Electing a Vested Benefit

State Membership - Females

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					55.0%		55.0%
5					56.0%		56.0%
6					57.0%		57.0%
7	80	55	68.8%	46.4	58.0%	46.4	58.0%
8	48	33	68.8%	28.3	59.0%	28.3	59.0%
9	51	30	58.8%	30.6	60.0%	30.6	60.0%
10	65	45	69.2%	40.3	62.0%	40.3	62.0%
11	44	29	65.9%	28.2	64.0%	28.2	64.0%
12	37	25	67.6%	24.4	66.0%	24.4	66.0%
13	39	24	61.5%	26.5	68.0%	26.5	68.0%
14	27	19	70.4%	18.9	70.0%	18.9	70.0%
15	34	21	61.8%	24.5	72.0%	24.5	72.0%
16	12	10	83.3%	8.9	74.0%	8.9	74.0%
17	15	9	60.0%	11.4	76.0%	11.4	76.0%
18	17	14	82.4%	13.3	78.0%	13.3	78.0%
19	23	14	60.9%	18.4	80.0%	18.4	80.0%
20	16	12	75.0%	13.1	82.0%	13.1	82.0%
21	13	7	53.8%	10.9	84.0%	10.9	84.0%
22	10	9	90.0%	8.6	86.0%	8.6	86.0%
23	12	9	75.0%	10.6	88.0%	10.6	88.0%
24	3	3	100.0%	2.7	90.0%	2.7	90.0%
25	6	2	33.3%	5.5	92.0%	5.5	92.0%
26	3	1	33.3%	2.8	94.0%	2.8	94.0%
27	3	2	66.7%	2.9	96.0%	2.9	96.0%
28	3	3	100.0%	2.9	98.0%	2.9	98.0%
29	2	1	50.0%	2.0	100.0%	2.0	100.0%
30	2	1	50.0%	2.0	100.0%	2.0	100.0%
	565	378	66.9%	384.1	68.0%	384.1	68.0%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-8

Probability of Electing a Vested Benefit

State Membership - Females (Weighted)

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					55.0%		55.0%
5					56.0%		56.0%
6					57.0%		57.0%
7	2,719	1,905	70.1%	1,577.3	58.0%	1,577.3	58.0%
8	2,131	1,571	73.7%	1,257.4	59.0%	1,257.4	59.0%
9	2,410	1,420	58.9%	1,446.1	60.0%	1,446.1	60.0%
10	3,623	2,646	73.1%	2,246.1	62.0%	2,246.1	62.0%
11	2,512	1,691	67.3%	1,607.8	64.0%	1,607.8	64.0%
12	2,717	1,796	66.1%	1,793.1	66.0%	1,793.1	66.0%
13	2,899	1,798	62.0%	1,971.1	68.0%	1,971.1	68.0%
14	2,262	1,561	69.0%	1,583.5	70.0%	1,583.5	70.0%
15	3,300	2,138	64.8%	2,376.2	72.0%	2,376.2	72.0%
16	1,262	1,056	83.7%	933.9	74.0%	933.9	74.0%
17	1,466	850	58.0%	1,114.1	76.0%	1,114.1	76.0%
18	1,827	1,546	84.6%	1,425.2	78.0%	1,425.2	78.0%
19	2,622	1,570	59.9%	2,097.2	80.0%	2,097.2	80.0%
20	2,024	1,532	75.7%	1,659.8	82.0%	1,659.8	82.0%
21	1,769	934	52.8%	1,486.0	84.0%	1,486.0	84.0%
22	1,687	1,516	89.8%	1,450.8	86.0%	1,450.8	86.0%
23	1,748	1,311	75.0%	1,538.1	88.0%	1,538.1	88.0%
24	325	325	100.0%	292.2	90.0%	292.2	90.0%
25	842	252	29.9%	775.1	92.0%	775.1	92.0%
26	385	142	36.9%	361.8	94.0%	361.8	94.0%
27	562	331	58.9%	539.1	96.0%	539.1	96.0%
28	705	705	100.0%	691.2	98.0%	691.2	98.0%
29	499	365	73.1%	499.1	100.0%	499.1	100.0%
30	354	163	46.2%	353.9	100.0%	353.9	100.0%
	42,650	29,126	68.3%	31,076.0	72.9%	31,076.0	72.9%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-9

Probability of Electing a Vested Benefit

Other Membership - Males

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					60.0%		60.0%
5					62.0%		62.0%
6					64.0%		64.0%
7	192	147	76.6%	126.7	66.0%	126.7	66.0%
8	172	134	77.9%	117.0	68.0%	117.0	68.0%
9	125	95	76.0%	87.5	70.0%	87.5	70.0%
10	83	56	67.5%	58.9	71.0%	58.9	71.0%
11	91	68	74.7%	65.5	72.0%	65.5	72.0%
12	81	61	75.3%	59.1	73.0%	59.1	73.0%
13	49	33	67.3%	36.3	74.0%	36.3	74.0%
14	44	36	81.8%	33.0	75.0%	33.0	75.0%
15	37	29	78.4%	28.1	76.0%	28.1	76.0%
16	36	29	80.6%	27.7	77.0%	27.7	77.0%
17	33	27	81.8%	25.7	78.0%	25.7	78.0%
18	33	28	84.8%	26.1	79.0%	26.1	79.0%
19	33	25	75.8%	26.4	80.0%	26.4	80.0%
20	19	16	84.2%	15.4	81.0%	15.4	81.0%
21	11	10	90.9%	9.0	82.0%	9.0	82.0%
22	11	9	81.8%	9.1	83.0%	9.1	83.0%
23	4	4	100.0%	3.4	84.0%	3.4	84.0%
24	4	4	100.0%	3.4	85.0%	3.4	85.0%
25	8	4	50.0%	6.9	86.0%	6.9	86.0%
26	12	12	100.0%	10.4	87.0%	10.4	87.0%
27	4	2	50.0%	3.5	88.0%	3.5	88.0%
28	1	1	100.0%	0.9	89.0%	0.9	89.0%
29	4	3	75.0%	3.6	90.0%	3.6	90.0%
30	1	-	0.0%	0.9	90.0%	0.9	90.0%
	1,088	833	76.6%	784.6	72.1%	784.6	72.1%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-10

Probability of Electing a Vested Benefit

Other Membership - Males (Weighted)

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					60.0%		60.0%
5					62.0%		62.0%
6					64.0%		64.0%
7	5,927	4,511	76.1%	3,911.6	66.0%	3,911.6	66.0%
8	5,299	3,777	71.3%	3,603.6	68.0%	3,603.6	68.0%
9	5,169	3,950	76.4%	3,618.4	70.0%	3,618.4	70.0%
10	4,022	2,816	70.0%	2,855.4	71.0%	2,855.4	71.0%
11	5,205	3,889	74.7%	3,747.4	72.0%	3,747.4	72.0%
12	4,038	2,762	68.4%	2,947.9	73.0%	2,947.9	73.0%
13	3,232	2,307	71.4%	2,391.5	74.0%	2,391.5	74.0%
14	3,283	2,671	81.4%	2,462.1	75.0%	2,462.1	75.0%
15	2,785	2,008	72.1%	2,116.3	76.0%	2,116.3	76.0%
16	2,551	2,004	78.6%	1,963.9	77.0%	1,963.9	77.0%
17	3,239	2,268	70.0%	2,526.1	78.0%	2,526.1	78.0%
18	3,276	2,638	80.5%	2,587.9	79.0%	2,587.9	79.0%
19	3,136	2,421	77.2%	2,508.5	80.0%	2,508.5	80.0%
20	2,267	1,976	87.1%	1,836.6	81.0%	1,836.6	81.0%
21	1,320	1,149	87.0%	1,082.7	82.0%	1,082.7	82.0%
22	1,332	1,029	77.2%	1,105.6	83.0%	1,105.6	83.0%
23	796	796	100.0%	669.1	84.0%	669.1	84.0%
24	485	485	100.0%	412.1	85.0%	412.1	85.0%
25	1,212	664	54.8%	1,042.2	86.0%	1,042.2	86.0%
26	1,774	1,774	100.0%	1,543.0	87.0%	1,543.0	87.0%
27	726	313	43.2%	638.5	88.0%	638.5	88.0%
28	323	323	100.0%	287.1	89.0%	287.1	89.0%
29	447	317	70.9%	402.7	90.0%	402.7	90.0%
30	218	-	0.0%	195.8	90.0%	195.8	90.0%
	62,059	46,846	75.5%	46,455.8	74.9%	46,455.8	74.9%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-11

Probability of Electing a Vested Benefit

Other Membership - Females

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					70.0%		70.0%
5					70.0%		70.0%
6					70.0%		70.0%
7	408	323	79.2%	285.6	70.0%	285.6	70.0%
8	332	278	83.7%	232.4	70.0%	232.4	70.0%
9	288	230	79.9%	205.9	71.5%	205.9	71.5%
10	216	175	81.0%	157.7	73.0%	157.7	73.0%
11	180	155	86.1%	134.1	74.5%	134.1	74.5%
12	142	117	82.4%	107.9	76.0%	107.9	76.0%
13	112	95	84.8%	86.8	77.5%	86.8	77.5%
14	104	80	76.9%	82.2	79.0%	82.2	79.0%
15	106	88	83.0%	84.8	80.0%	84.8	80.0%
16	76	69	90.8%	61.6	81.0%	61.6	81.0%
17	76	60	78.9%	62.3	82.0%	62.3	82.0%
18	61	53	86.9%	50.6	83.0%	50.6	83.0%
19	57	53	93.0%	47.9	84.0%	47.9	84.0%
20	39	35	89.7%	33.2	85.0%	33.2	85.0%
21	35	34	97.1%	30.1	86.0%	30.1	86.0%
22	23	19	82.6%	20.0	87.0%	20.0	87.0%
23	23	19	82.6%	20.2	88.0%	20.2	88.0%
24	16	14	87.5%	14.2	89.0%	14.2	89.0%
25	7	7	100.0%	6.3	90.0%	6.3	90.0%
26	6	5	83.3%	5.4	90.0%	5.4	90.0%
27	9	8	88.9%	8.1	90.0%	8.1	90.0%
28	9	9	100.0%	8.1	90.0%	8.1	90.0%
29	4	4	100.0%	3.6	90.0%	3.6	90.0%
30	3	3	100.0%	2.7	90.0%	2.7	90.0%
	2,332	1,933	82.9%	1,751.7	75.1%	1,751.7	75.1%

Iowa Public Employees' Retirement System

2017 - 2021 Experience Study

Data Summary I-12

Probability of Electing a Vested Benefit

Other Membership - Females (Weighted)

Duration	Exposure	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
4					70.0%		70.0%
5					70.0%		70.0%
6					70.0%		70.0%
7	9,734	7,641	78.5%	6,813.7	70.0%	6,813.7	70.0%
8	9,554	7,790	81.5%	6,687.6	70.0%	6,687.6	70.0%
9	9,365	7,135	76.2%	6,696.2	71.5%	6,696.2	71.5%
10	8,037	6,229	77.5%	5,867.2	73.0%	5,867.2	73.0%
11	8,042	6,898	85.8%	5,991.5	74.5%	5,991.5	74.5%
12	6,342	5,010	79.0%	4,819.9	76.0%	4,819.9	76.0%
13	5,580	4,856	87.0%	4,324.9	77.5%	4,324.9	77.5%
14	5,879	4,546	77.3%	4,644.7	79.0%	4,644.7	79.0%
15	6,140	4,814	78.4%	4,912.4	80.0%	4,912.4	80.0%
16	4,808	4,382	91.1%	3,894.7	81.0%	3,894.7	81.0%
17	5,697	4,353	76.4%	4,671.8	82.0%	4,671.8	82.0%
18	4,904	3,877	79.1%	4,070.1	83.0%	4,070.1	83.0%
19	4,933	4,691	95.1%	4,143.7	84.0%	4,143.7	84.0%
20	2,914	2,346	80.5%	2,476.6	85.0%	2,476.6	85.0%
21	2,932	2,867	97.8%	2,521.4	86.0%	2,521.4	86.0%
22	1,782	1,466	82.3%	1,550.0	87.0%	1,550.0	87.0%
23	2,827	2,352	83.2%	2,487.6	88.0%	2,487.6	88.0%
24	1,294	1,083	83.7%	1,151.8	89.0%	1,151.8	89.0%
25	846	846	100.0%	761.0	90.0%	761.0	90.0%
26	681	578	85.0%	612.6	90.0%	612.6	90.0%
27	883	799	90.6%	794.3	90.0%	794.3	90.0%
28	916	916	100.0%	824.8	90.0%	824.8	90.0%
29	704	704	100.0%	633.4	90.0%	633.4	90.0%
30	498	498	100.0%	448.3	90.0%	448.3	90.0%
	105,292	86,678	82.3%	81,800.0	77.7%	81,800.0	77.7%

APPENDIX J

SALARY INCREASES

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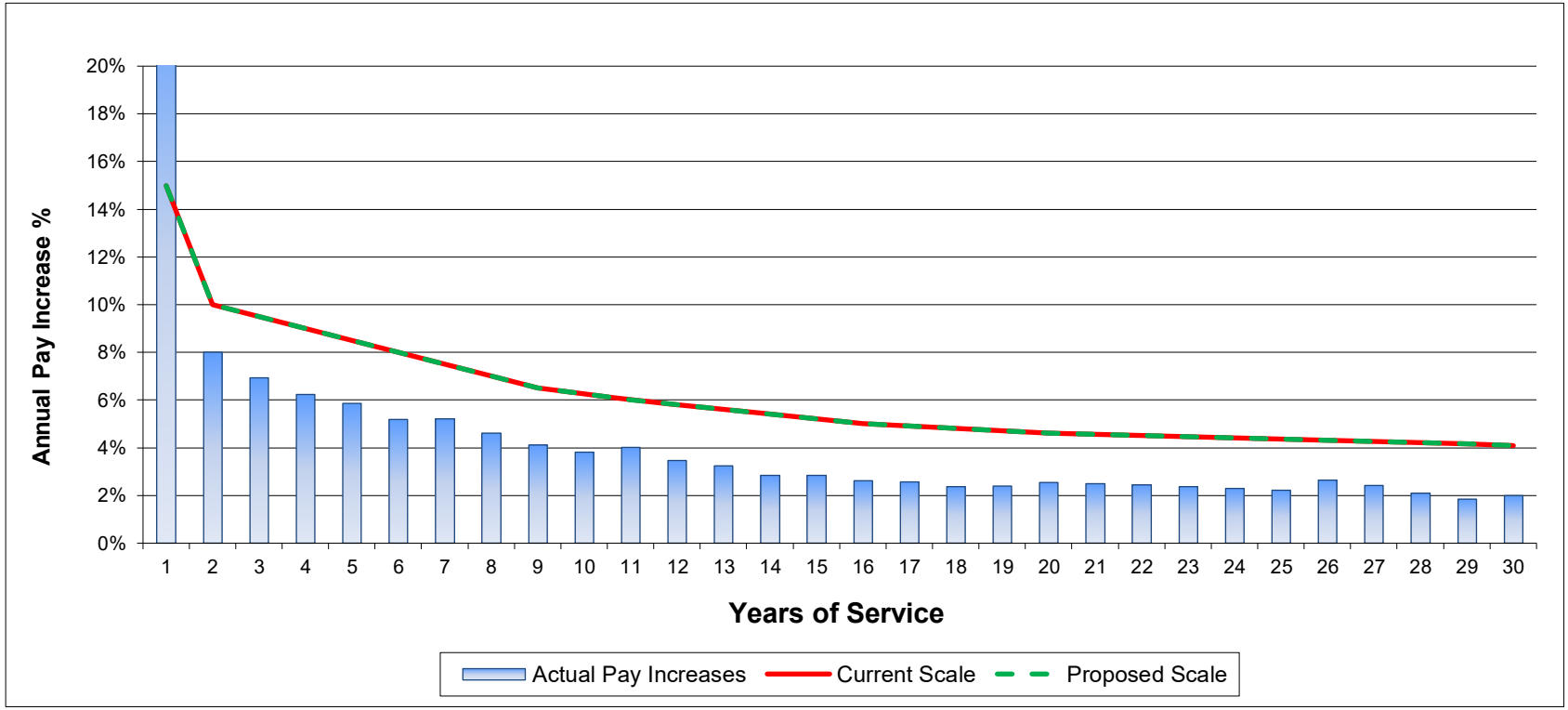
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit J-1

Salary Increases

State Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Salary Increases	3.70%	5.73%	5.73%

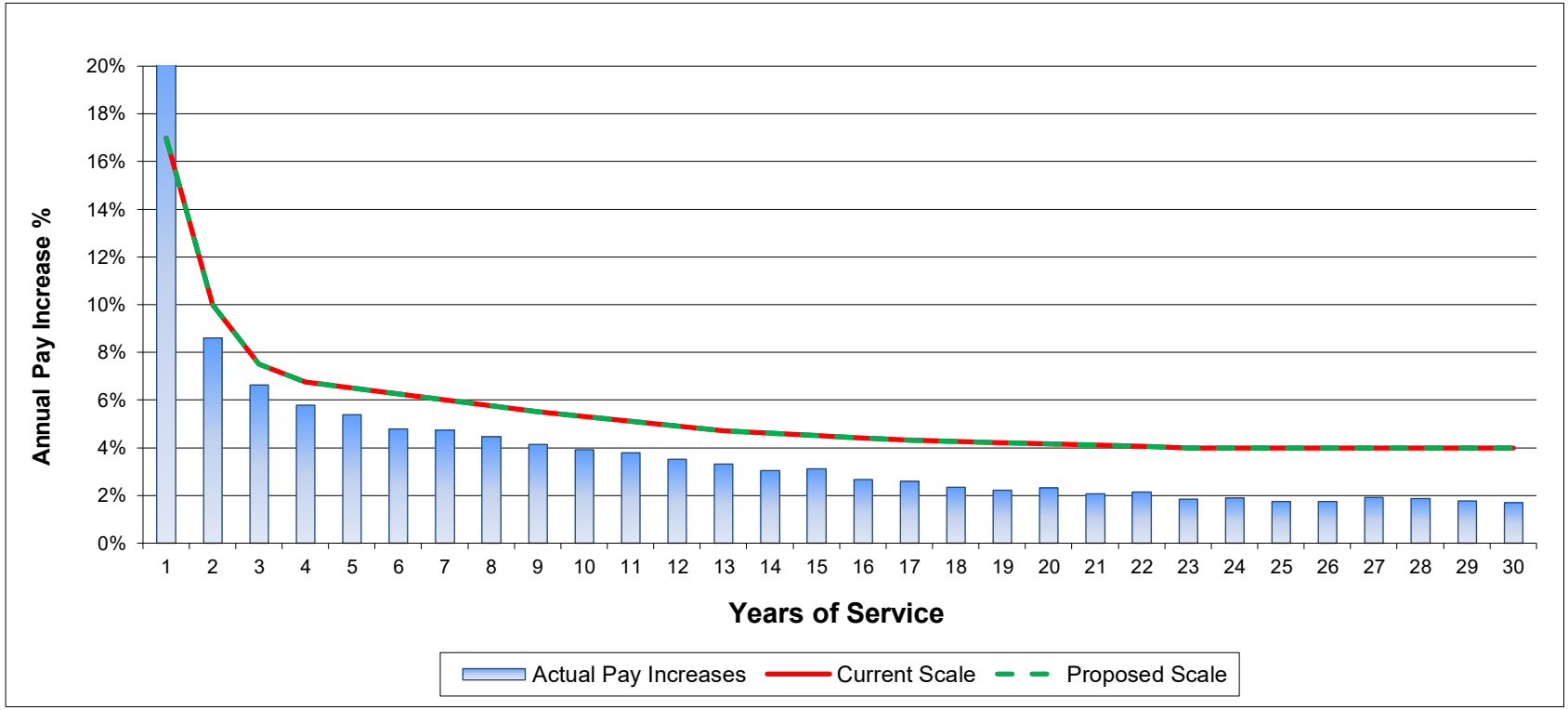
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit J-2

Salary Increases

School Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Salary Increases	3.65%	5.02%	5.02%

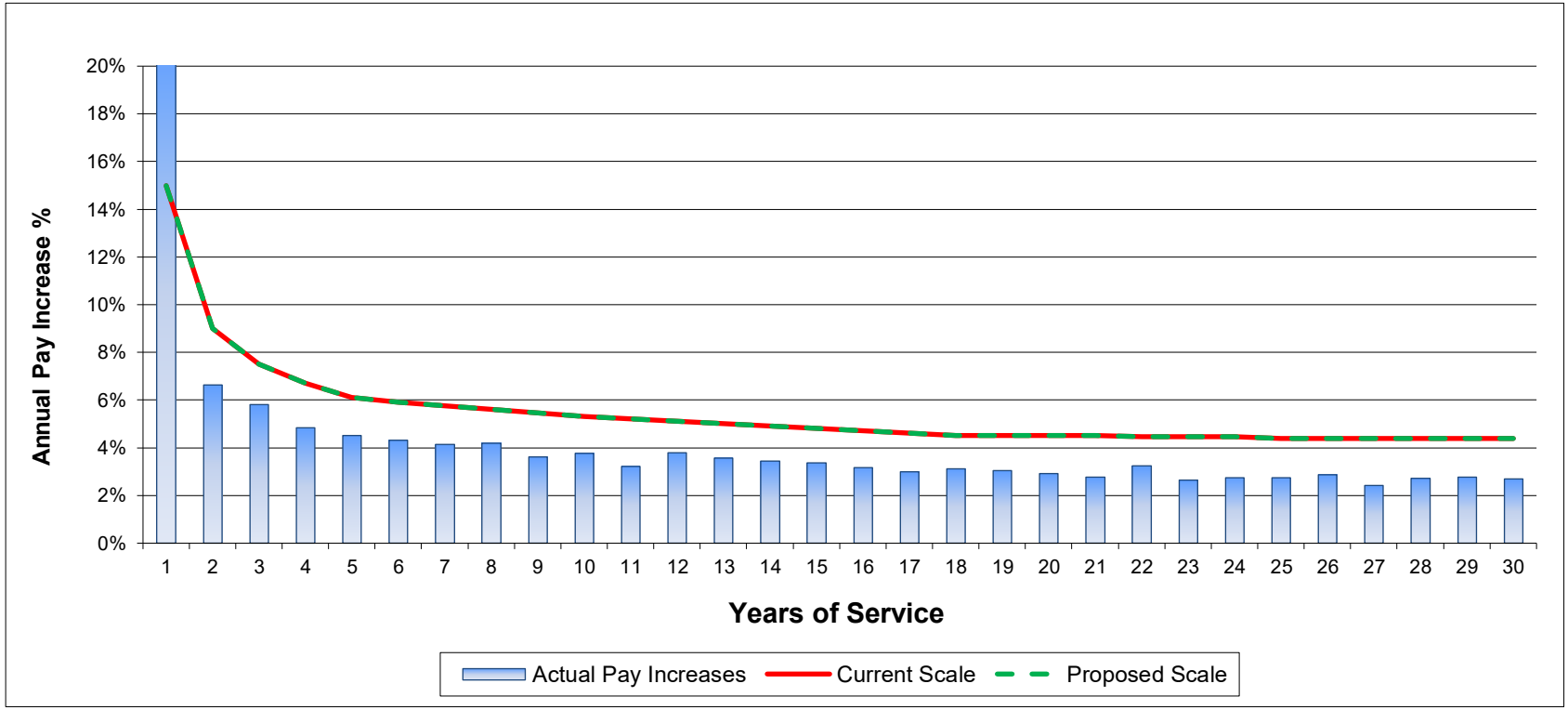
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit J-3

Salary Increases

Other Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Salary Increases	4.03%	5.28%	5.28%

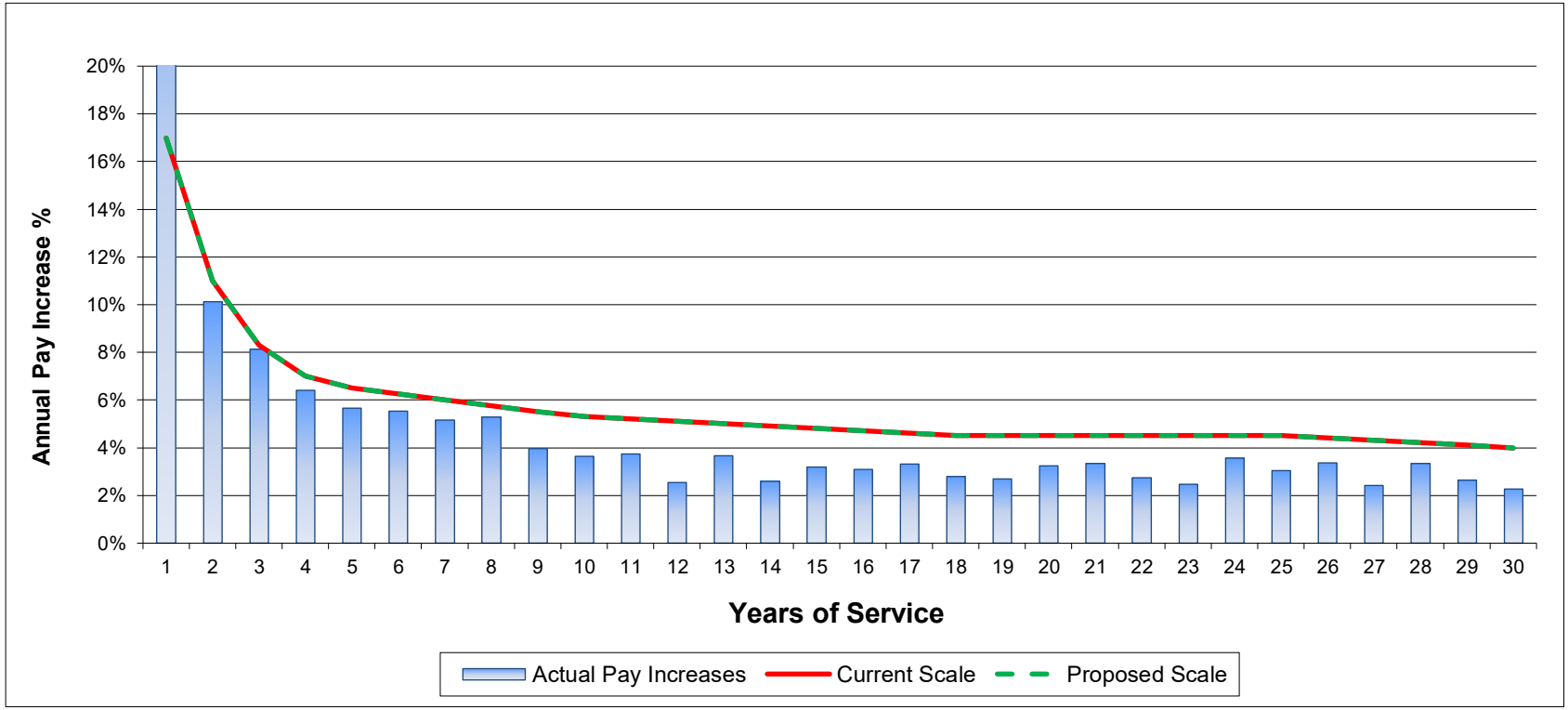
Iowa Public Employees' Retirement System

2017-2021 Experience Study

Exhibit J-4

Salary Increases

Special Services Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Salary Increases	4.38%	5.37%	5.37%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary J-1

Salary Increases

State Membership

Duration	Initial Salary (Millions)	Subsequent Salary (Millions)	Actual Rate	Current Expected (Millions)	Current Rate	Proposed Expected (Millions)	Proposed Rate
1	150.4	186.8	24.3%	172.9	15.0%	172.9	15.0%
2	143.7	155.2	8.0%	158.0	10.0%	158.0	10.0%
3	130.8	139.9	7.0%	143.2	9.5%	143.2	9.5%
4	128.6	136.7	6.2%	140.2	9.0%	140.2	9.0%
5	124.4	131.7	5.9%	135.0	8.5%	135.0	8.5%
6	111.7	117.4	5.2%	120.6	8.0%	120.6	8.0%
7	114.5	120.5	5.2%	123.1	7.5%	123.1	7.5%
8	105.8	110.7	4.6%	113.3	7.0%	113.3	7.0%
9	123.6	128.7	4.1%	131.7	6.5%	131.7	6.5%
10	151.9	157.8	3.8%	161.4	6.3%	161.4	6.3%
11	151.0	157.1	4.0%	160.1	6.0%	160.1	6.0%
12	166.6	172.4	3.5%	176.3	5.8%	176.3	5.8%
13	154.0	159.0	3.3%	162.6	5.6%	162.6	5.6%
14	139.8	143.8	2.9%	147.4	5.4%	147.4	5.4%
15	119.6	123.0	2.9%	125.8	5.2%	125.8	5.2%
16	105.4	108.2	2.6%	110.7	5.0%	110.7	5.0%
17	111.7	114.6	2.6%	117.2	4.9%	117.2	4.9%
18	121.6	124.5	2.4%	127.4	4.8%	127.4	4.8%
19	133.4	136.6	2.4%	139.6	4.7%	139.6	4.7%
20	138.7	142.2	2.6%	145.1	4.6%	145.1	4.6%
21	125.3	128.4	2.5%	131.0	4.6%	131.0	4.6%
22	115.5	118.3	2.5%	120.7	4.5%	120.7	4.5%
23	101.5	103.9	2.4%	106.0	4.5%	106.0	4.5%
24	87.7	89.8	2.3%	91.6	4.4%	91.6	4.4%
25	78.5	80.3	2.2%	82.0	4.4%	82.0	4.4%
26	63.5	65.2	2.6%	66.2	4.3%	66.2	4.3%
27	58.3	59.7	2.4%	60.8	4.3%	60.8	4.3%
28	63.1	64.4	2.1%	65.7	4.2%	65.7	4.2%
29	66.0	67.3	1.8%	68.8	4.2%	68.8	4.2%
30	69.5	70.9	2.0%	72.4	4.1%	72.4	4.1%
	3,456.3	3,615.1	4.6%	3,676.8	6.4%	3,676.8	6.4%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary J-2

Salary Increases

School Membership

Duration	Initial Salary (Millions)	Subsequent Salary (Millions)	Actual Rate	Current Expected (Millions)	Current Rate	Proposed Expected (Millions)	Proposed Rate
1	518.9	634.5	22.3%	607.1	17.0%	607.1	17.0%
2	559.2	607.3	8.6%	615.1	10.0%	615.1	10.0%
3	565.6	603.2	6.6%	608.0	7.5%	608.0	7.5%
4	564.0	596.8	5.8%	602.1	6.8%	602.1	6.7%
5	563.3	593.7	5.4%	599.9	6.5%	599.9	6.5%
6	556.8	583.5	4.8%	591.6	6.3%	591.6	6.3%
7	528.9	554.0	4.7%	560.7	6.0%	560.7	6.0%
8	490.1	512.0	4.5%	518.2	5.8%	518.2	5.8%
9	467.4	486.9	4.2%	493.1	5.5%	493.1	5.5%
10	467.8	486.2	3.9%	492.6	5.3%	492.6	5.3%
11	475.2	493.2	3.8%	499.4	5.1%	499.4	5.1%
12	503.4	521.1	3.5%	528.1	4.9%	528.1	4.9%
13	503.8	520.6	3.3%	527.5	4.7%	527.5	4.7%
14	487.4	502.2	3.0%	509.8	4.6%	509.8	4.6%
15	465.6	480.2	3.1%	486.6	4.5%	486.6	4.5%
16	446.5	458.4	2.7%	466.2	4.4%	466.2	4.4%
17	447.6	459.2	2.6%	466.8	4.3%	466.8	4.3%
18	453.1	463.7	2.3%	472.4	4.3%	472.4	4.3%
19	455.6	465.7	2.2%	474.7	4.2%	474.7	4.2%
20	441.1	451.4	2.3%	459.4	4.2%	459.4	4.2%
21	414.9	423.5	2.1%	431.9	4.1%	431.9	4.1%
22	382.8	391.0	2.1%	398.3	4.1%	398.3	4.1%
23	358.9	365.6	1.9%	373.2	4.0%	373.2	4.0%
24	335.7	342.1	1.9%	349.1	4.0%	349.1	4.0%
25	316.6	322.1	1.7%	329.2	4.0%	329.2	4.0%
26	293.2	298.4	1.8%	305.0	4.0%	305.0	4.0%
27	262.2	267.3	1.9%	272.7	4.0%	272.7	4.0%
28	238.3	242.8	1.9%	247.8	4.0%	247.8	4.0%
29	204.7	208.3	1.8%	212.9	4.0%	212.9	4.0%
30	176.0	179.0	1.7%	183.0	4.0%	183.0	4.0%
	12,944.7	13,514.1	4.4%	13,682.6	5.7%	13,682.6	5.7%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary J-3

Salary Increases

Other Membership

Duration	Initial Salary (Millions)	Subsequent Salary (Millions)	Actual Rate	Current Expected (Millions)	Current Rate	Proposed Expected (Millions)	Proposed Rate
1	651.1	789.6	21.3%	748.7	15.0%	748.7	15.0%
2	671.4	716.0	6.6%	731.9	9.0%	731.9	9.0%
3	620.0	656.1	5.8%	666.5	7.5%	666.5	7.5%
4	588.1	616.6	4.8%	627.5	6.7%	627.5	6.7%
5	533.3	557.5	4.5%	565.8	6.1%	565.8	6.1%
6	485.2	506.2	4.3%	513.8	5.9%	513.8	5.9%
7	440.3	458.5	4.1%	465.6	5.8%	465.6	5.8%
8	384.1	400.2	4.2%	405.6	5.6%	405.6	5.6%
9	365.1	378.3	3.6%	385.0	5.5%	385.0	5.5%
10	351.6	364.8	3.8%	370.2	5.3%	370.2	5.3%
11	328.3	338.9	3.2%	345.4	5.2%	345.4	5.2%
12	320.5	332.7	3.8%	336.8	5.1%	336.8	5.1%
13	292.8	303.3	3.6%	307.4	5.0%	307.4	5.0%
14	258.1	267.0	3.5%	270.7	4.9%	270.7	4.9%
15	239.8	247.9	3.4%	251.3	4.8%	251.3	4.8%
16	226.5	233.7	3.2%	237.2	4.7%	237.2	4.7%
17	226.6	233.5	3.0%	237.1	4.6%	237.1	4.6%
18	232.4	239.7	3.1%	242.9	4.5%	242.9	4.5%
19	235.5	242.7	3.0%	246.1	4.5%	246.1	4.5%
20	222.5	229.0	2.9%	232.5	4.5%	232.5	4.5%
21	198.9	204.4	2.8%	207.8	4.5%	207.8	4.5%
22	182.0	187.9	3.2%	190.1	4.5%	190.1	4.5%
23	164.3	168.7	2.6%	171.6	4.5%	171.6	4.5%
24	148.0	152.0	2.8%	154.5	4.5%	154.5	4.5%
25	140.4	144.3	2.8%	146.6	4.4%	146.6	4.4%
26	125.1	128.7	2.9%	130.6	4.4%	130.6	4.4%
27	113.0	115.7	2.4%	117.9	4.4%	117.9	4.4%
28	107.5	110.4	2.7%	112.2	4.4%	112.2	4.4%
29	102.9	105.7	2.8%	107.4	4.4%	107.4	4.4%
30	93.3	95.9	2.7%	97.5	4.4%	97.5	4.4%
	9,048.4	9,525.7	5.3%	9,624.3	6.4%	9,624.3	6.4%

Iowa Public Employees' Retirement System

2017-2021 Experience Study

Data Summary J-4

Salary Increases

Special Services Membership

Duration	Initial Salary (Millions)	Subsequent Salary (Millions)	Actual Rate	Current Expected (Millions)	Current Rate	Proposed Expected (Millions)	Proposed Rate
1	84.9	111.6	31.4%	99.4	17.0%	99.4	17.0%
2	90.5	99.7	10.1%	100.5	11.0%	100.5	11.0%
3	82.4	89.1	8.1%	89.3	8.3%	89.3	8.3%
4	78.1	83.1	6.4%	83.6	7.0%	83.6	7.0%
5	74.0	78.2	5.7%	78.8	6.5%	78.8	6.5%
6	66.8	70.5	5.5%	71.0	6.3%	71.0	6.3%
7	65.5	68.9	5.2%	69.4	6.0%	69.4	6.0%
8	57.1	60.1	5.3%	60.4	5.8%	60.4	5.8%
9	61.7	64.2	4.0%	65.1	5.5%	65.1	5.5%
10	70.3	72.8	3.7%	74.0	5.3%	74.0	5.3%
11	68.1	70.6	3.8%	71.6	5.2%	71.6	5.2%
12	73.6	75.5	2.6%	77.4	5.1%	77.4	5.1%
13	65.4	67.8	3.7%	68.7	5.0%	68.7	5.0%
14	58.2	59.7	2.6%	61.1	4.9%	61.1	4.9%
15	56.7	58.5	3.2%	59.4	4.8%	59.4	4.8%
16	50.1	51.7	3.1%	52.5	4.7%	52.5	4.7%
17	52.2	53.9	3.3%	54.6	4.6%	54.6	4.6%
18	56.1	57.7	2.8%	58.7	4.5%	58.7	4.5%
19	56.6	58.1	2.7%	59.1	4.5%	59.1	4.5%
20	59.2	61.1	3.2%	61.8	4.5%	61.8	4.5%
21	53.6	55.3	3.4%	56.0	4.5%	56.0	4.5%
22	46.7	47.9	2.7%	48.8	4.5%	48.8	4.5%
23	40.3	41.3	2.5%	42.1	4.5%	42.1	4.5%
24	32.9	34.1	3.6%	34.4	4.5%	34.4	4.5%
25	30.3	31.2	3.0%	31.7	4.5%	31.7	4.5%
26	24.8	25.6	3.4%	25.9	4.4%	25.9	4.4%
27	22.6	23.1	2.4%	23.5	4.3%	23.5	4.3%
28	21.8	22.5	3.4%	22.7	4.2%	22.7	4.2%
29	19.6	20.1	2.7%	20.4	4.1%	20.4	4.1%
30	16.4	16.8	2.3%	17.1	4.0%	17.1	4.0%
	1,636.5	1,731.0	5.8%	1,738.7	6.2%	1,738.7	6.2%