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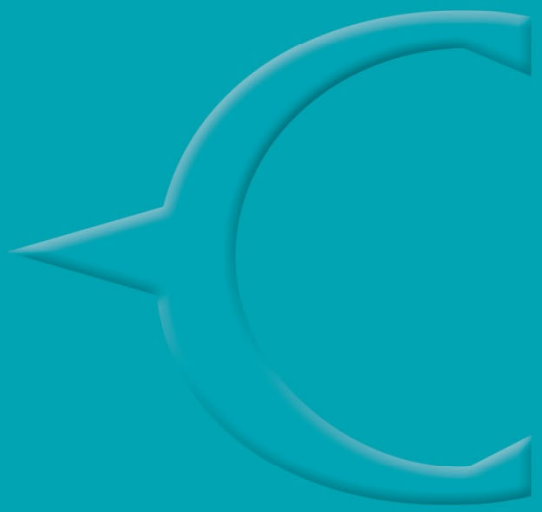

Pennsylvania Municipal Retirement System

Experience Study Results and Recommendations

For the period covering January 1, 2019 – December 31, 2023

Produced by Cheiron

October 2025

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Letter Of Transmittal

October 8, 2025

Pennsylvania Municipal Retirement Board of the
Pennsylvania Municipal Retirement System
c/o Richard Cardamone, CPA, CGMA
Chief Financial Officer
1721 North Front Street
Harrisburg, PA 17102-2315

Dear Board Members:

At your request, we have completed an experience study of the Pennsylvania Municipal Retirement System (PMRS). Our study compares assumed versus actual experience with respect to all demographic and economic assumptions used in the preparation of the Actuarial Valuations for the five-year period from January 1, 2019 through December 31, 2023.

The purpose of this report is to present the results of our examination of the System's assumptions. After a review of these results with the Board, the System's proposed assumptions presented in this report were formally adopted at the Board of Directors meeting on September 18, 2025 and are now considered the new assumptions. These new assumptions will be incorporated in the January 1, 2026 Actuarial Valuation. This report is for the use of PMRS and its auditors, in accordance with applicable law and accounting requirements.

In preparing this report, we relied on information (some oral and some written) supplied by PMRS. This information includes, but is not limited to, the plan provisions and employee data. The employee data used in this report includes both data provided for actuarial valuations as well as supplemental data provided for the purposes of this study by PMRS. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

Sincerely,
Cheiron

Karen Zangara

Karen Zangara, FSA, MAAA, EA
Principal Consulting Actuary

Anthony Bucci, FCA, EA, MAAA
Consulting Actuary

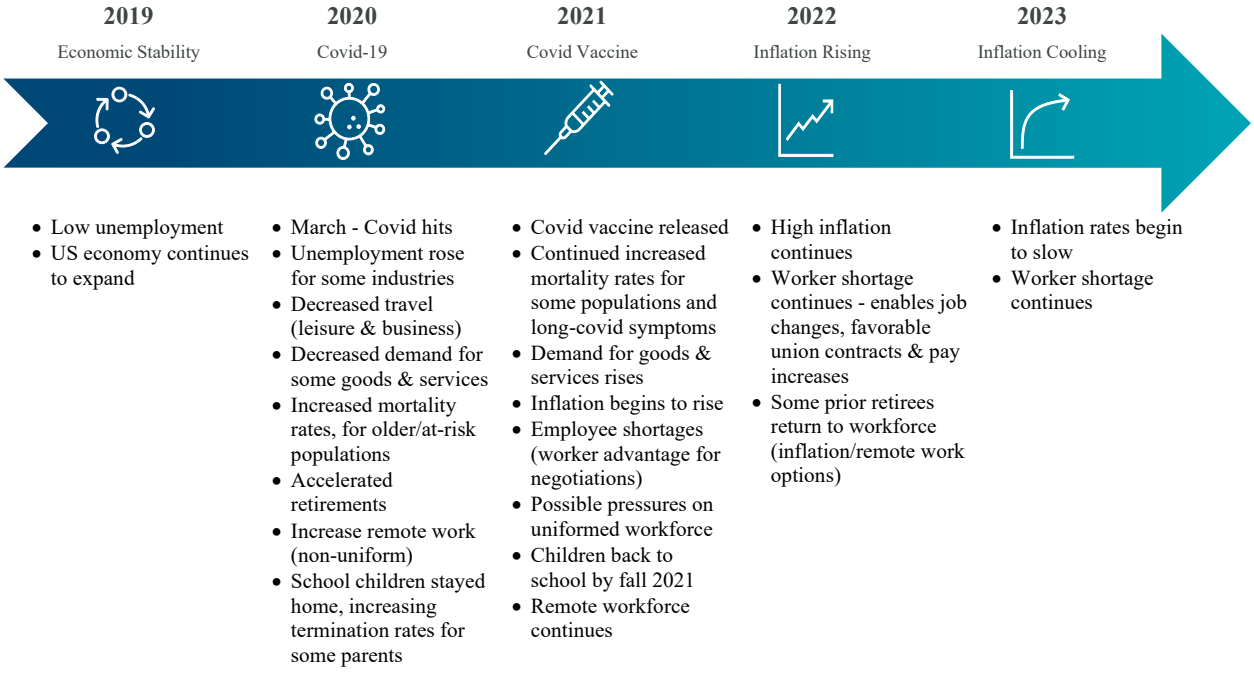
Cc: Jonathan Chipko, Cheiron

SECTION I – BOARD SUMMARY

At the request of the Retirement Board and as required under §881.105 of Pennsylvania Municipal Retirement Law (PMRL) Act 15 of 1974, Cheiron has performed a study of the experience of the Pennsylvania Municipal Retirement System (PMRS). This experience study examines PMRS's experience during the five-year period from January 1, 2019 through December 31, 2023, "The Study Period." Based on a review of this experience, past trends, as well as future expectations, alternative assumptions were proposed for several of the current actuarial assumptions. After a review of the current and proposed assumptions, the Board approved and adopted the proposed assumptions referenced throughout this report at the PMRS Board of Directors Meeting on September 18, 2025. These new assumptions will be applied to future valuations of PMRS beginning January 1, 2026.

We studied PMRS's experience with respect to both "demographic" and "economic" assumptions. Demographic assumptions include the retirement rates, termination rates, disability rates, mortality rates, marital status and the male/female percentage of participants at PMRS. Economic assumptions include inflation, salary increase rate (salary scale) and discount rate. Salary increases can be considered either demographic (membership oriented) or economic (given the inflation component). For this report, we included salary experience with the economic portion of the study.

The following chart highlights year-by-year some of the significant events that occurred during this Study Period.



The COVID-19 pandemic and subsequent events likely impacted participant behavior over the Study Period and led to changes in experience. In general, there was a trend in America of accelerated retirements in 2020, although some of these retirees returned to work in 2022 or later. Workforce shortages in tandem with a high period of inflation from 2022-2023 may have led to increased pay and/or job changes for many industries. Some uniformed workforces during this time period may have had increased retirements and difficulties with hiring new officers.

SECTION I – BOARD SUMMARY

Furthermore, the increase in remote / hybrid workforce, especially for non-uniformed positions, may have impacted turnover and retirement rates.

Actuarial assumptions reflect long-term projected pensions potentially paid many years in the future. As such, the Board may consider tempering significant changes to assumptions that could be based on temporary behavior changes influenced by the COVID-19 pandemic. Alternatively, other changes from the pandemic may have a more permanent impact on the workforce, such as hybrid work arrangements.

Actuaries are required to follow the Actuarial Standards of Practice (ASOP) when completing experience studies. ASOP No. 27 is the Selection of Assumptions for Measuring Pension Obligations. In completing this experience study, this ASOP was frequently referenced to ensure that these standards are being followed. For example, ASOP No. 27 outlines the types of demographic assumptions, the demographic assumption selection process, the relevant assumption universe available, and how to select specific assumptions that are reasonable. Unique features associated with each demographic assumption were considered, such as some plan design features and municipality size.

SECTION I – BOARD SUMMARY

Table I-1 summarizes the current and new assumptions adopted by the Board at the Board of Directors Meeting on September 18, 2025.

Table I – 1
Changes to Economic and Demographic Assumptions
(All Non-Uniform and Uniform Plans)

Demographic	Current Assumptions 1/1/2021 – 12/31/2025	New Assumptions as of 1/1/2026
Retirement Rates	Rates vary by age for Non-Uni/Uniform plans Accelerated DROP/In-service Distribution retirement rates	Rates vary by DROP vs Non-DROP; Muni varies by 1st eligible/Post 1st eligible
Termination Rates	Non-Uniform rates continue split by plan size <25 / 25+	Eliminate breakpoint for plan size Slight updates
	Uniform rates for all plans regardless of size	Slight updates
Disability Assumptions	• 50% 2017 CalPERS Public Miscellaneous Group disability rate table male • Service disabilities 20%/70% for Non-Uniform/Uniform • Workers Comp offset is 25% of final pay for Non-Uniform Plans	No changes to disability rates. Workers compensation offset equals 22% of final average pay and ends when the participant is 65 years old for all plans that have an offset.
Mortality Rates - Healthy Actives	PUB-2010 General Employee table MP-2018 mortality improvements to 2023	PUB- 2016 General Employee Male/Female Tables below median amounts-weighted, mortality improvements with MP-2021 fully generational
Mortality Rates - Healthy Retirees	RP-2006 Retiree Healthy table MP-2018 mortality improvements to 2023	PUB- 2016 General Healthy Annuitant Male/Female Tables below median amounts-weighted, mortality improvements with MP-2021 fully generational
Mortality Rates - Disabled	RP-2006 Retiree Disabled table MP-2018 mortality improvements to 2023	PUB- 2016 General Disabled Annuitant Male/ Female Tables amounts-weighted, mortality improvements with MP-2021 fully generational
Miscellaneous Demographic		
Marital Status	85%/65% married males/females Wives 3 years younger than spouses	Change to 80% married males No other changes
Population Composition	70% males 30% females	No change
Economic		
Inflation/Cost of Living Rate	2.2%	2.5%
Salary Increase Rate	Age and Service based tables Inflation plus merit/promotional	Service based tables + 2.75% wage-inflation (2.5% inflation + 0.25% margin)
	Prior to retirement, an additional 6% increase in salary	No Change.

The Discount Rate (also known as the Regular Interest Rate or Crediting Rate) was not reviewed in this report because the Board implements a robust analysis annually. In lieu of this analysis, we are only outlining the process applied by the Board when reviewing this assumption.

SECTION I – BOARD SUMMARY

Methods for Experience Study Analysis

This report is structured to:

1. Describe the current assumption basis
2. Review the key findings of the related experience over the study period
3. Discuss additional considerations, if appropriate, and the proposed assumptions which were adopted by the Board as the new assumptions beginning January 1, 2026

Demographic assumptions predict when benefits will be paid in the future. The timing of benefits is dependent on several factors – how long the participant will work, benefit eligibility, retirement age eligibility, and how long they will receive benefits. Participant statuses considered are:

- Active (accruing benefits)
- Inactive not in receipt (deferring benefits)
- Disabled in receipt
- Retired / Inactive in receipt (receiving benefits, ceasing benefits)
- Deceased / Beneficiary in receipt
- Deceased no further benefits due

Changes in status refer to a participant who experiences a change in their employment or becomes deceased as shown in the categories listed above (e.g. “active to terminated”, “retired to died”, etc.). To determine the actual plan experience over the Study Period, we determine the status of each participant on each census date. Then we determine the transition rates between all statuses from one census date to the next.

- Decrements - The types of status movement (e.g. “retirement decrements”)
- Exposures - The number of participants eligible for each decrement (e.g., “retirement eligibility”)

The demographic assumptions define a probability for each decrement. This probability, when applied to the number of exposures, is used to determine the expected number of decrement occurrences. The actual number of occurrences is compared to the expected number of occurrences to determine how well the assumption predicted the overall participant behavior.

For the majority of the decrement-related demographic assumptions noted in Table I-1, we provide graphs outlining the results of the experience study analysis and the proposed new assumptions.

SECTION I – BOARD SUMMARY

Graph Analysis

The graphs in Section II of this report provide the results of the experience study for each demographic assumption under review. Along the left axis is the rate of the decrement occurring while the participant's age or service (depending upon the assumption) is provided along the horizontal axis.
There are four items provided in each graph for the demographic assumptions:

(i) "Actual Rates": actual rate of the status change (black dots)

(ii) "Expected Rates": expected rate of the status change based on the current assumptions (red lines)

(iii) "Proposed Rate": expected rate of the status change based on the proposed assumptions (yellow lines)

(iv) "90% Confidence Intervals": reasonability of status change rate, wider is less credible (grey bars)

All "proposed" assumptions shown in the graphs and tables were reviewed and adopted by the Board as the new assumptions.

In addition to reviewing the ratios of actual versus expected experience, the credibility of the data at each study period is also reviewed. Credibility refers to the question: "Do we have enough data to make a judgment that the experience supports a change in trend to warrant an assumption change?"

In any statistical analysis of trends, one must consider whether the experience is sufficient to believe a true change is occurring over what was expected in the past. For example, if a coin is flipped twice and the result of both actions is "heads", one will not necessarily conclude that heads will occur 100% of the time. However, if the coin is flipped 20 times and all flips result in heads, one would have more confidence in believing that "heads" occurs much more frequently. The more incidences that occur at a data point, such as a specific age, the greater the confidence that the experience is real and will continue to occur at the observed rate. Thus, we put more credence on high confidence intervals.

The credibility of the data in the graphs is illustrated by *90% confidence intervals* (grey bars). The 90% confidence range indicates that there is a 90% probability that the true results fall within this interval (the area of the grey bars). Less data will result in wider confidence intervals, which is an indication that the data may be insufficient to provide much information regarding where the true value lies. The converse is true as well, the smaller the confidence interval, the more credible the data. Typically, we want to consider assumption changes around the data points with the narrowest bars because the data is sufficient to support the expectation that these results represent reasonable expectations of future participant behavior.

SECTION I – BOARD SUMMARY

Analysis of Experience and Proposed Demographic Assumptions

To compare actual rates to expected rates, we will consider, as applicable, the following:

(i) A/E Ratio – Ratio of Actual to Expected experience

(ii) R-squared (R^2) – defines how well the assumption "matches" the data

Actual versus Expected (A/E Ratio):

For some of the demographic assumptions, we determined an A/E occurrence ratio (sometimes further segregated by gender or by plan type). For example, for Non-Uniformed pension plans that do not offer a Deferred Retirement Option, there were 579 participants who retired after their first year of attaining normal retirement age during the study period. However, there were 652 participants who were expected to retire during this period based on the current assumptions. Therefore, the ratio of actual to expected terminations is 89% (579 divided by 652).

When the A/E ratio is greater than one, the rates for the assumption may be too low; when less than one, the rates for the assumption may be too high. When there is a trend of rates that are materially too high or low and the data is credible, the proposed assumption is intended to bring the ratios closer to one, which means the number of people we expect for an occurrence under the proposed assumptions is closer to the actual number of people who had the occurrence.

R-Squared Factor:

Another statistical measurement that is sometimes used in the review of some assumptions is the R-squared factor. This value describes how well the assumption matches the data by measuring the proportion of the variance of the assumption versus the experience. A value closer to 100% indicates a better match to the data.

While these two statistical values can be useful tools for evaluating the appropriateness of current or proposed assumptions, they do not tell the whole story. For example:

- The A/E ratio may be skewed by outlier age groups. Therefore, in addition to reviewing the overall A/E ratio for an assumption, it is important to review each data point's A/E ratio to see if this has occurred.
- While an A/E ratio closer to one may demonstrate an assumption as more "accurate", sometimes additional considerations are warranted, such as the amount of credible data.
- It may be beneficial to also review prior studies to understand how the experience of the current Study Period compares to experience from prior time periods, especially given the global changes over the last several years discussed earlier in this report.
- The A/E ratio and R-squared factor analysis provide quantitative measures for the Study Period only. Additional factors including input from the Board may impact expectations going forward.

For the majority of graphs, the supporting data details are also provided.

SECTION I – BOARD SUMMARY

Analysis of Economic Assumption Review

The review of the economic assumptions is based upon the following, which is reviewed in more detail in Section III of the report:

- Historical economic experience (i.e. the markets),
- Historical experience of the plan,
- Outlook for the future, and
- Assumptions used by other public sector plans.

In Section II, we present detailed analysis and exhibits supporting the various demographic assumption changes. In Section III we present similar information with respect to the economic assumptions.

Some of these assumption changes will result in PMRS applying new administrative factors beginning in 2026. If there are limitations to the administrative system to incorporate these new assumptions, it is our understanding that simplifying assumptions and methods may be deemed acceptable by PMRS. For example, applying fully generational mortality tables to determine present value factors may be overly complicated and impractical. An acceptable alternative could be to use the mortality improvement tables projected a fixed number of years, which would provide consistency in the present value factors and mortality improvements.

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

In this section, we present the key findings of our experience review of the demographic assumptions used by PMRS, including proposed assumptions that were reviewed and adopted by the Board. The demographic assumptions included in this review are:

1. Retirement
2. Termination from Active Employment (Other than Death, Disability, or Retirement)
3. Disability
4. Mortality (Active, Inactive Healthy, and Inactive Disabled)
5. Marriage Percentage and Spouse's Age
6. Population Composition

1. Retirement

This assumption provides the probability when active participants are expected to retire. Participants meeting the eligibility requirements for normal retirement benefits are "exposed" to the retirement assumption.

Although some PMRS municipalities offer early retirement benefits, all early retirement benefits are actuarially equivalent to the normal retirement benefits. In other words, they are not subsidized and do not provide an incentive to retire early. When early retirement benefits are not subsidized, all benefits paid earlier than the normal retirement age are actuarially equivalent to the benefits paid at the normal retirement date. This means there is no gain or loss associated with the value of the benefit paid to a participant electing early retirement.

According to ASOP No. 27, for retirement rates "employer-specific or job-related factors" should be considered. The job-related factors as it pertains to the Non-Uniformed Plans compared to the Uniform Plans are different. For example, active participants in a Uniform Plan may have more physically demanding work environments. As such, it is common to see retirement plan provisions for Uniform Plans that tend to permit these active participants to retire earlier than Non-Uniformed Plans. Therefore, these assumptions were reviewed separately for Non-Uniformed and Uniform Plans.

Another factor that may impact retirement rates is whether a plan offers a Deferred Retirement Option Plan (DROP) or In-Service Distribution payment options. These options allow participants to start receiving their pension benefits (either into a DROP account or directly) and continue to work up to a specified period until they fully cease employment. Therefore, these options may encourage participants to retire earlier than otherwise. As of the last experience study, very few PMRS plans offered DROP or In-Service Distribution payment options so an estimated increase in retirement rates was applied to these plans. For this experience study we have credible retirement rates for plans that offer these deferred retirement options. Therefore, these retirement assumptions were reviewed separately for "DROP" (including In-Service Distribution) vs. "Non-DROP" plans.

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

A. Current Assumptions

The valuation assumption for retirement rates is divided into Uniformed and Non-Uniformed plans with rates divided into "Non-DROP" plans (excludes plans offering DROP and/or In-Service Distributions) and "DROP" plans (plans offering DROP and/or In-Service Distributions).

Assumptions are based on ages once normal retirement eligibility requirements are met. Rates for Non-Uniformed plans were increased for the first year the participant becomes eligible for normal retirement. DROP plans assumed a 30% increase in retirement rates for Uniform plans and 15% increase for Non-Uniformed plans.

B. Experience and Proposed Assumptions

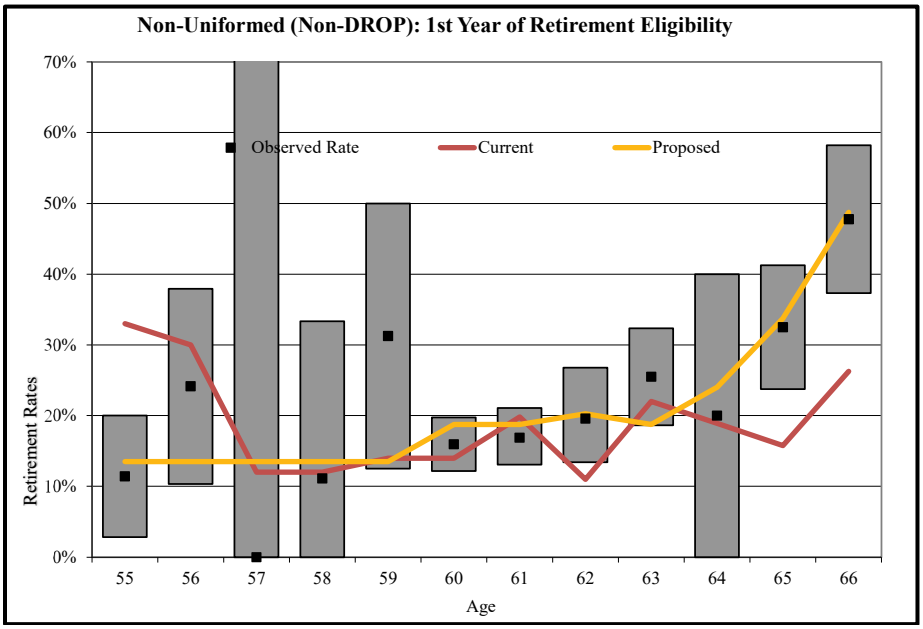
The following section provides the graphs summarizing the plan experience compared to the current assumptions and the proposed assumptions and the A/E ratio and R-Squared statistics. All proposed retirement rates improve the A/E ratio and/or R-Squared factor.

Non-DROP (Deferred Retirement Option Plans) or In-Service Distribution Plans

Non-Uniformed Plans – non-DROP 1st year of eligibility for retirement.

While the data for participants who retired from Non-Uniformed non-DROP plans during their first year of retirement eligibility was less credible (wider grey bars), there was still sufficient data to support a separate assumption for these participants. Proposed assumptions (the yellow line) were increased at the later years.

Chart II-1



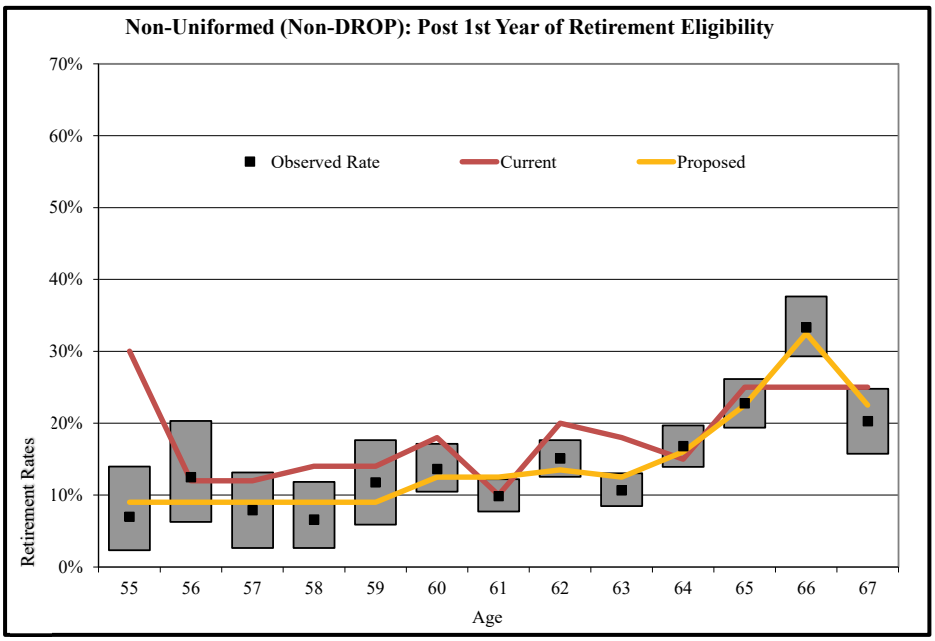
Assumption	A/E Ratio	R-Squared
Current	117%	80%
Proposed	98%	96%

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Non-Uniformed Plans – Non-DROP Post 1st year eligibility

Data for participants who retired from Non-Uniformed non-DROP plans after their first year of retirement eligibility was credible, which is shown below by the narrow grey bars which represent the 90% confidence intervals. Proposed retirement rates decreased overall.

Chart II-2



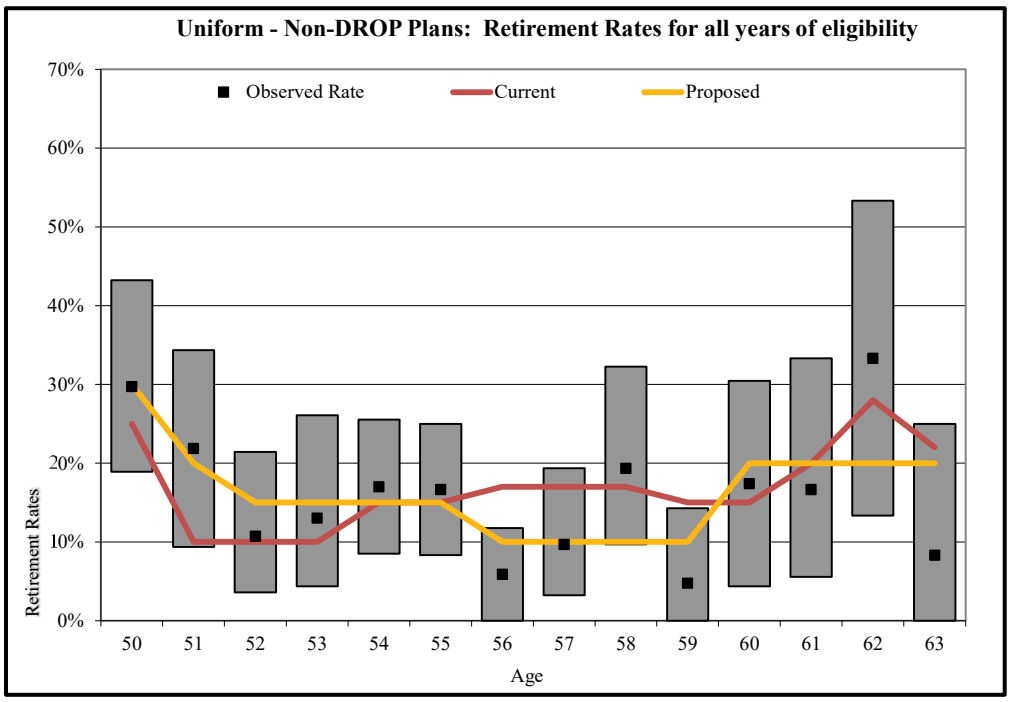
Assumption	A/E Ratio	R-Squared
Current	88%	83%
Proposed	99%	98%

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Uniform Plans – non-DROP

First eligibility and post first eligibility retirement rates did not yield a material difference for the uniform plans. Comparing to graph illustrated in Chart II-2 for the Non-Uniformed plans, the wider grey bars below illustrate fewer retirements and less credible data. However, we still propose having a different Uniform retirement assumption from the Non-Uniformed assumption due to the tendency of Uniformed Plans to have younger Normal Retirement Ages.

Chart II-3



Assumption	A/E Ratio	R-Squared
Current	100%	59%
Proposed	100%	82%

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

DROP (Deferred Retirement Option Plans) or In-Service Distribution Plans

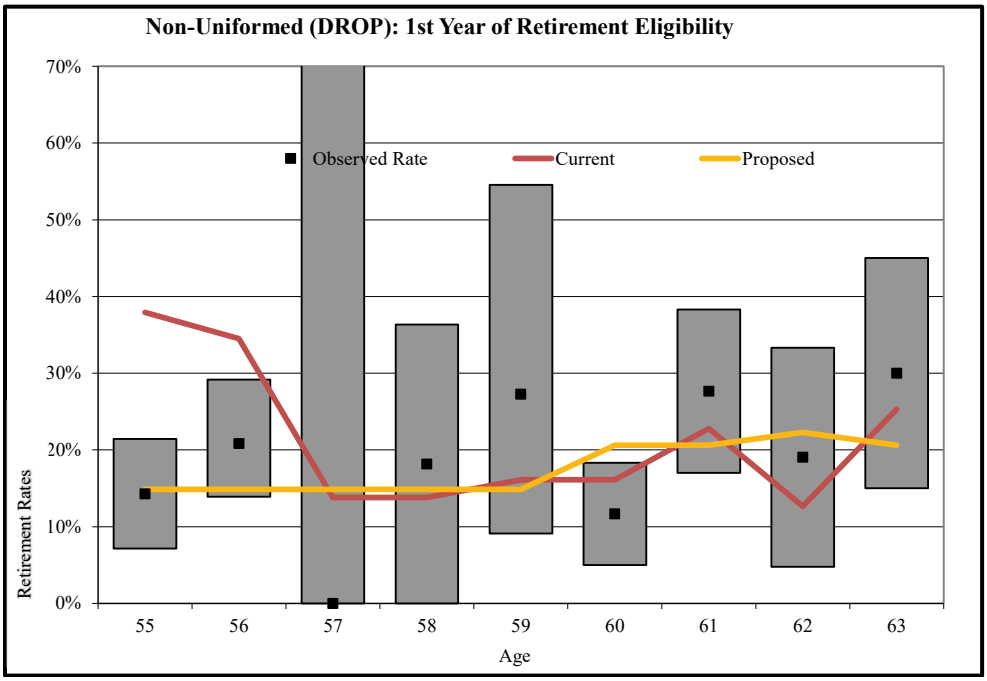
The increase in the number of PMRS plans offering DROP or In-Service Distribution options in recent years has enabled the analysis of retirement rates to be compared separately for these plans.

Non-Uniformed Plans – DROP

Overall, the retirement rates for Non-Uniformed plans with DROPs are about 10% higher than the Non-Uniformed plans without DROP. The data for the first year of retirement eligibility is less credible for this analysis. Therefore, greater consideration was given to the Non-Uniformed DROP plans after their first year of retirement eligibility in the determination of the 10% load factor. This load factor is applied to the proposed rates previously discussed.

Non-Uniformed Plans – DROP 1st year of eligibility for retirement.

Chart II-4

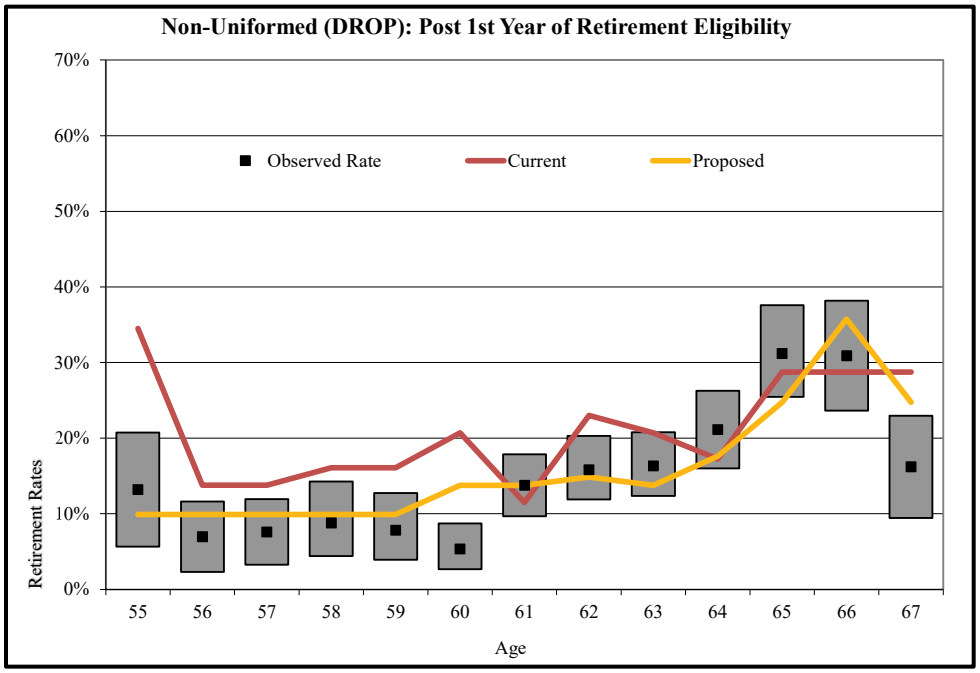


Assumption	A/E Ratio	R-Squared
Current	75%	70%
Proposed	109%	69%

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Non-Uniformed Plans – DROP Post 1st year eligibility

Chart II-5



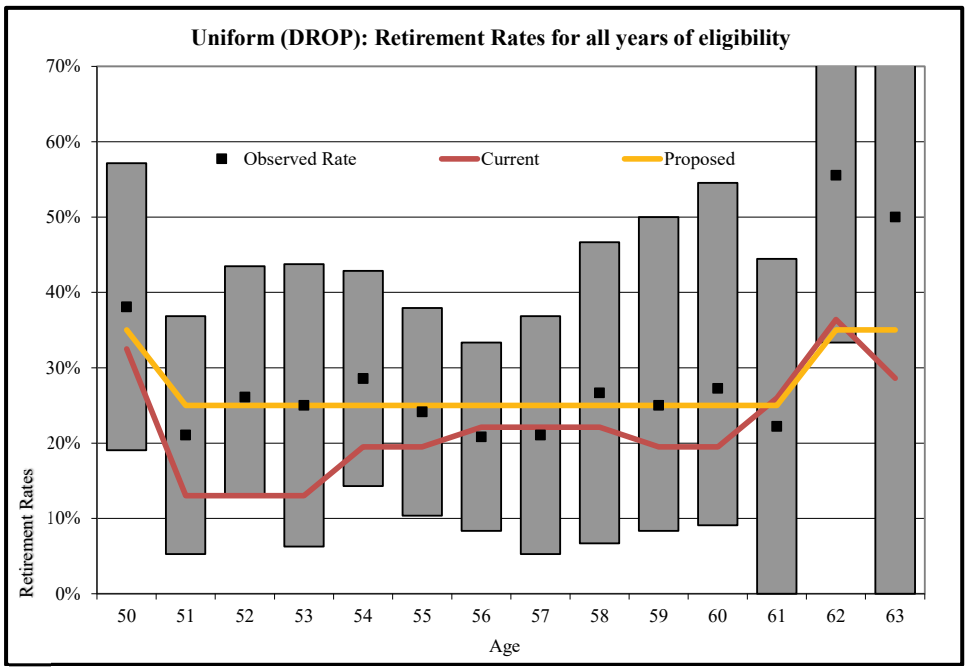
Assumption	A/E Ratio	R-Squared
Current	78%	69%
Proposed	98%	87%

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Uniformed Plans – DROP

For Uniform plans with DROPs, the data was less credible for this analysis when compared to Chart II-3, Uniform non-DROP plans. However, there was an increase in the retirement rates at earlier ages that should be reflected, as outlined in the proposed rates on the graph.

Chart II-6



Assumption	A/E Ratio	R-Squared
Current	131%	76%
Proposed	102%	88%

C. Data Tables

The tables on the following pages compare three items: the number of people eligible to retire, the number of people expected to retire based on the current assumptions, and the number of people expected to retire based on the proposed assumptions. This data was used to determine the graphs provided above.

The proposed assumptions overall bring the A/E ratios closer to one, which is seen in the far right green column compared to the far right blue column. The total A/E ratio is provided at the bottom of each column. In other words, the number of people expected to retire under the proposed assumptions is closer to the actual number of people who actually retired. The R-squared factors are also provided in the tables below.

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Table II-1

Non-Uniformed (Non-DROP): 1st Year of Retirement Eligibility									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
55	35	4	12	5	11.4%	33.0%	13.5%	35%	85%
56	29	7	9	4	24.1%	30.0%	13.5%	80%	179%
57	13	0	2	2	0.0%	12.0%	13.5%	0%	0%
58	9	1	1	1	11.1%	12.0%	13.5%	93%	82%
59	16	5	2	2	31.3%	14.0%	13.5%	223%	231%
60	238	38	33	45	16.0%	14.0%	18.8%	114%	85%
61	237	40	47	44	16.9%	19.8%	18.8%	85%	90%
62	97	19	11	20	19.6%	11.0%	20.3%	178%	97%
63	102	26	22	19	25.5%	22.0%	18.8%	116%	136%
64	10	2	2	2	20.0%	18.9%	24.0%	106%	83%
65	80	26	13	27	32.5%	15.8%	33.8%	206%	96%
66	67	32	18	33	47.8%	26.3%	48.8%	182%	98%
TOTAL	**933**	**200**	**171**	**204**	**21.4%**	**18.3%**	**21.8%**	**117%**	**98%**
R-squared			**80%**	**96%**					

Table II-2

Non-Uniformed (Non-DROP): Post 1st Year of Retirement Eligibility									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
55	43	3	13	4	7.0%	30.0%	9.0%	23%	78%
56	64	8	8	6	12.5%	12.0%	9.0%	104%	139%
57	76	6	9	7	7.9%	12.0%	9.0%	66%	88%
58	76	5	11	7	6.6%	14.0%	9.0%	47%	73%
59	85	10	12	8	11.8%	14.0%	9.0%	84%	131%
60	286	39	51	36	13.6%	18.0%	12.5%	76%	109%
61	467	46	47	58	9.9%	10.0%	12.5%	99%	79%
62	510	77	102	69	15.1%	20.0%	13.5%	75%	112%
63	507	54	91	63	10.7%	18.0%	12.5%	59%	85%
64	452	76	68	72	16.8%	15.0%	16.0%	112%	105%
65	413	94	103	93	22.8%	25.0%	22.5%	91%	101%
66	348	116	87	113	33.3%	25.0%	32.5%	133%	103%
67	222	45	56	50	20.3%	25.0%	22.5%	81%	90%
TOTAL	**3,549**	**579**	**657**	**586**	**16.3%**	**18.5%**	**16.5%**	**88%**	**99%**
R-squared			**83%**	**98%**					

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Table II-3

Uniform (Non-DROP): Retirement									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	37	11	9	11	29.7%	25.0%	30.0%	119%	99%
51	32	7	3	6	21.9%	10.0%	20.0%	219%	109%
52	28	3	3	4	10.7%	10.0%	15.0%	107%	71%
53	23	3	2	3	13.0%	10.0%	15.0%	130%	87%
54	47	8	7	7	17.0%	15.0%	15.0%	113%	113%
55	48	8	7	7	16.7%	15.0%	15.0%	111%	111%
56	34	2	6	3	5.9%	17.0%	10.0%	35%	59%
57	31	3	5	3	9.7%	17.0%	10.0%	57%	97%
58	31	6	5	3	19.4%	17.0%	10.0%	114%	194%
59	21	1	3	2	4.8%	15.0%	10.0%	32%	48%
60	23	4	3	5	17.4%	15.0%	20.0%	116%	87%
61	18	3	4	4	16.7%	20.0%	20.0%	83%	83%
62	15	5	4	3	33.3%	28.0%	20.0%	119%	167%
63	12	1	3	2	8.3%	22.0%	20.0%	38%	42%
TOTAL	**400**	**65**	**65**	**65**	**16.3%**	**16.3%**	**16.2%**	**100%**	**100%**
R-squared			**59%**	**82%**					

Table II-4

Non-Uniformed (DROP): 1st Year of Retirement Eligiblity									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
55	56	8	21	8	14.3%	38.0%	14.9%	38%	96%
56	72	15	25	11	20.8%	34.5%	14.9%	60%	140%
57	2	0	0	0	0.0%	13.8%	14.9%	0%	0%
58	11	2	2	2	18.2%	13.8%	14.9%	132%	122%
59	11	3	2	2	27.3%	16.1%	14.9%	169%	184%
60	60	7	10	12	11.7%	16.1%	20.6%	72%	57%
61	47	13	11	10	27.7%	22.8%	20.6%	121%	134%
62	21	4	3	5	19.0%	12.7%	22.3%	151%	86%
63	20	6	5	4	30.0%	25.3%	20.6%	119%	145%
TOTAL	**300**	**58**	**78**	**53**	**19.3%**	**25.9%**	**17.8%**	**75%**	**109%**
R-squared			**70%**	**69%**					

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Table II-5

Non-Uniformed (DROP): Post 1st Year of Retirement Eligiblity									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
55	53	7	18	5	13.2%	34.5%	9.9%	38%	133%
56	86	6	12	9	7.0%	13.8%	9.9%	51%	70%
57	92	7	13	9	7.6%	13.8%	9.9%	55%	77%
58	91	8	15	9	8.8%	16.1%	9.9%	55%	89%
59	102	8	16	10	7.8%	16.1%	9.9%	49%	79%
60	149	8	31	20	5.4%	20.7%	13.8%	26%	39%
61	196	27	23	27	13.8%	11.5%	13.8%	120%	100%
62	202	32	46	30	15.8%	23.0%	14.9%	69%	107%
63	202	33	42	28	16.3%	20.7%	13.8%	79%	119%
64	175	37	30	31	21.1%	17.3%	17.6%	123%	120%
65	157	49	45	39	31.2%	28.8%	24.8%	109%	126%
66	110	34	32	39	30.9%	28.8%	35.8%	108%	86%
67	74	12	21	18	16.2%	28.8%	24.8%	56%	66%
TOTAL	**1,689**	**268**	**344**	**274**	**15.9%**	**20.4%**	**16.3%**	**78%**	**98%**
R-squared			**69%**	**87%**					

Table II-6

Uniform (DROP): Retirement									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	21	8	7	7	38.1%	32.5%	35.0%	117%	109%
51	19	4	2	5	21.1%	13.0%	25.0%	162%	84%
52	23	6	3	6	26.1%	13.0%	25.0%	201%	104%
53	16	4	2	4	25.0%	13.0%	25.0%	192%	100%
54	28	8	5	7	28.6%	19.5%	25.0%	147%	114%
55	29	7	6	7	24.1%	19.5%	25.0%	124%	97%
56	24	5	5	6	20.8%	22.1%	25.0%	94%	83%
57	19	4	4	5	21.1%	22.1%	25.0%	95%	84%
58	15	4	3	4	26.7%	22.1%	25.0%	121%	107%
59	12	3	2	3	25.0%	19.5%	25.0%	128%	100%
60	11	3	2	3	27.3%	19.5%	25.0%	140%	109%
61	9	2	2	2	22.2%	26.0%	25.0%	85%	89%
62	9	5	3	3	55.6%	36.4%	35.0%	153%	159%
63	2	1	1	1	50.0%	28.6%	35.0%	175%	143%
TOTAL	**237**	**64**	**49**	**62**	**27.0%**	**20.7%**	**26.4%**	**131%**	**102%**
R-squared			**76%**	**88%**					

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

2. Termination from Active Employment

A. Current Assumptions

For the termination rates, in the past the size of the covered population for the Non-Uniformed plans was considered. Different rates apply for Non-Uniformed plans with less than 25 active participants and with 25 or more active participants. Furthermore, Non-Uniformed and Uniform Plans have distinct rates resulting in three tables of rates. In all cases, termination rates decrease as service increases.

B. Experience and Proposed Assumptions

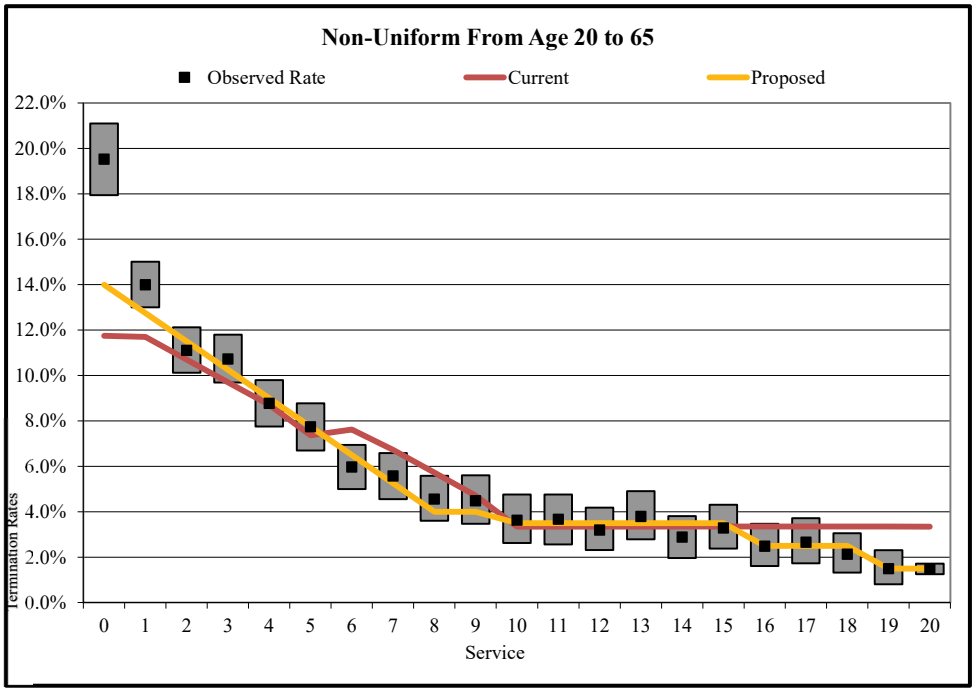
Similar to the prior studies, there was more credible data for the Non-Uniformed plans than the Uniform plans. We evaluated the termination rates based on plan size for the Non-Uniform Plans to determine if the 25+ breakpoint was still appropriate. The data no longer supports a continuation of this breakpoint for this group. Therefore, we are no longer proposing different termination rates based on the size of the plan. However, separate assumptions for Non-Uniform and Uniform plans are still supported by the data.

Non-Uniform Plans

In general, actual terminations were higher than expected based on shorter service participants. While the data appears credible for service less than 2 years, consideration for the events of the past 5 years may temper the change in this assumption. Decreased rates are suggested for 16+ years of service.

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Chart II-7



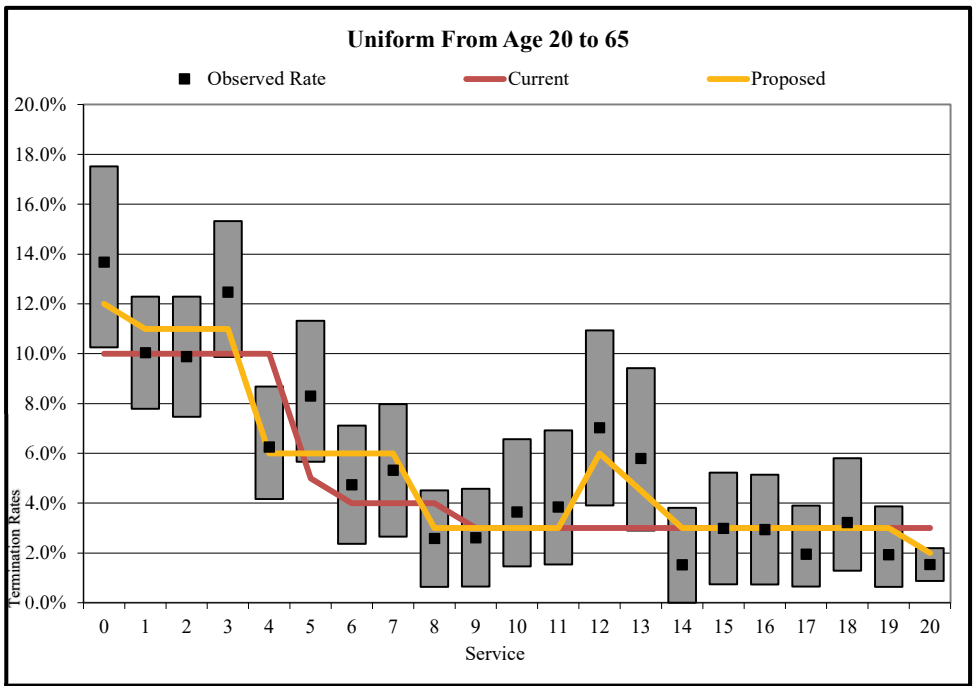
Assumption	A/E Ratio	R-Squared
Current	101%	86%
Proposed	106%	97%

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Uniform Plans

For the Uniform Plans, slight adjustments have been made at different years of service, most notably increasing termination rates at 12 and 13 years of service. This phenomenon may be explained by Act 600 Plans vesting participants after 12 years of service.

Chart II-8



Assumption	A/E Ratio	R-Squared
Current	103%	87%
Proposed	99%	96%

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

C. Data Tables

Table II-7

Non-Uniform Termination Rates - Ages 20 to 65									
		Terminations			Termination Rates			A/E Ratios	
Service	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
0	1,711	334	201	240	19.52%	11.75%	14.00%	166%	139%
1	3,238	453	379	413	13.99%	11.70%	12.75%	120%	110%
2	2,648	294	283	305	11.10%	10.70%	11.50%	104%	97%
3	2,322	249	225	238	10.72%	9.70%	10.25%	111%	105%
4	2,052	180	179	185	8.77%	8.71%	9.00%	101%	97%
5	1,835	142	135	142	7.74%	7.36%	7.75%	105%	100%
6	1,642	98	125	107	5.97%	7.63%	6.50%	78%	92%
7	1,382	77	93	73	5.57%	6.73%	5.25%	83%	106%
8	1,164	53	67	47	4.55%	5.72%	4.00%	80%	114%
9	981	44	46	39	4.49%	4.71%	4.00%	95%	112%
10	799	29	27	28	3.63%	3.34%	3.50%	109%	104%
11	819	30	27	29	3.66%	3.34%	3.50%	110%	105%
12	908	29	30	32	3.19%	3.35%	3.50%	95%	91%
13	897	34	30	31	3.79%	3.35%	3.50%	113%	108%
14	866	25	29	30	2.89%	3.35%	3.50%	86%	82%
15	882	29	29	31	3.29%	3.34%	3.50%	99%	94%
16	807	20	27	20	2.48%	3.35%	2.50%	74%	99%
17	754	20	25	19	2.65%	3.36%	2.50%	79%	106%
18	752	16	25	19	2.13%	3.36%	2.50%	63%	85%
19	738	11	25	11	1.49%	3.36%	1.50%	44%	99%
20	7,642	113	256	115	1.48%	3.35%	1.50%	44%	99%
TOTAL	**34,839**	**2,280**	**2,264**	**2,151**	**6.54%**	**6.50%**	**6.18%**	**101%**	**106%**
R-squared			**86%**	**97%**					

Table II-8

Uniform Termination Rates - Ages 20 to 65									
		Terminations			Termination Rates			A/E Ratios	
Service	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
0	234	32	23	28	13.68%	10.00%	12.00%	137%	114%
1	488	49	49	54	10.04%	10.00%	11.00%	100%	91%
2	415	41	42	46	9.88%	10.00%	11.00%	99%	90%
3	385	48	39	42	12.47%	10.00%	11.00%	125%	113%
4	288	18	29	17	6.25%	10.00%	6.00%	63%	104%
5	265	22	13	16	8.30%	5.00%	6.00%	166%	138%
6	211	10	8	13	4.74%	4.00%	6.00%	118%	79%
7	188	10	8	11	5.32%	4.00%	6.00%	133%	89%
8	155	4	6	5	2.58%	4.00%	3.00%	65%	86%
9	153	4	5	5	2.61%	3.00%	3.00%	87%	87%
10	137	5	4	4	3.65%	3.00%	3.00%	122%	122%
11	130	5	4	4	3.85%	3.00%	3.00%	128%	128%
12	128	9	4	8	7.03%	3.00%	6.00%	234%	117%
13	138	8	4	6	5.80%	3.00%	4.50%	193%	129%
14	131	2	4	4	1.53%	3.00%	3.00%	51%	51%
15	134	4	4	4	2.99%	3.00%	3.00%	100%	100%
16	136	4	4	4	2.94%	3.00%	3.00%	98%	98%
17	154	3	5	5	1.95%	3.00%	3.00%	65%	65%
18	155	5	5	5	3.23%	3.00%	3.00%	108%	108%
19	155	3	5	5	1.94%	3.00%	3.00%	65%	65%
20	909	14	27	18	1.54%	3.00%	2.00%	51%	77%
TOTAL	**5,089**	**300**	**290**	**302**	**5.90%**	**5.70%**	**5.94%**	**103%**	**99%**
R-squared			**87%**	**96%**					

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

3. Disability

A. Current Assumptions

The disability assumption provides the assumed rates of disability as well as the percentage of disabilities that are service-related. Current assumptions for all participants are based on age. The rates are 50% of the 2017 CalPERS Public Miscellaneous Group disability rates for males.

For the Non-Uniformed plans, 20% of disablements are assumed to be service related. For the Uniform plans, 70% of disablements are assumed to be service related.

The workers compensation offset for service-related disability benefits payable to Non-Uniformed plan participants are assumed to be 25% of final average salary.

B. Experience Data and Proposed Assumptions

The total number of disabilities over the period being reviewed does not provide sufficient data to be fully relied upon.

- Between non-uniformed and uniformed participants there were 44,775 participant exposures and only 14 actual new disabled participants reported as such during this period.
- Due to the low number of reported disabled participants, we do not recommend a change to the disability assumptions at this time.

For service-related disablements, current data supports no changes.

Plan Type	Current Assumption	Actual Service-Related Disability Rates	Proposed Service-Related Disability Rates
Non-Uniformed	20%	23%	20%
Uniform	70%	70%	70%

For workers compensation offset, we reviewed the disabled retiree data for 30 participants, as provided from PMRS, for plans that have a workers compensation offset for the service-related disability benefit.

- For the 16 disabled participants that had a workers compensation offset option applied to their disability benefit, on average the offset equaled about 22% of the participant's final average pay. The average age for these participants was 52 years old.
- For 14 participants that no longer have a workers compensation offset applied to their disability benefit, their average age was 65 years old. Upon review with PMRS, it was determined that workers compensation ends for some participants after a certain period of time for some plans and individuals, based on the workers compensation terms and award.
- Based on the information above, the proposed assumption is that the workers compensation offset equals 22% of final average pay and ends when the participant is 65 years old for all applicable plans.

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

4. Mortality

The mortality assumption has significant impact on the determination of pension plan liabilities as it determines how long participants are in receipt of their defined benefits. Therefore, setting the mortality rates to accurately reflect how long participants will receive their pension benefits is essential to accurately determine the liabilities of a pension plan. Consideration of projected mortality improvements should also be considered.

A. Current Assumptions

The mortality assumption is used to estimate when participants will die in the future. For PMRS, this assumption is the same for Non-Uniform and Uniform Plans. The mortality assumptions are sex-distinct assumptions as follows:

Participant Type	Base Table Name	Mortality Improvements	Improvement Projections
Healthy Actives* (Non-Annuitants)	PUB-2010 General Employee table	MP-2018	2023
Healthy Retirees (Annuitants)	RP-2006 Retiree Healthy table	MP-2018	2023
Disabled Retirees (Annuitants)	RP-2006 Retiree Disabled table	MP-2018	2023

*Includes terminated vested participants

B. Experience and Proposed Assumptions

By actuarial standards, a minimum of 1,082 deaths by subgroup is considered a fully credible dataset for adjusting a standard mortality table. As shown in the table below, the number of PMRS deaths among non-annuitant participants are relatively low and may not provide meaningful statistics on pre-retirement mortality over the Study Period. Deaths among the healthy retired population are higher, but even then, the death count within each data set falls below the credible threshold of 1,082.

Group	Gender	Exposures	Deaths
Non-Annuitant	Male	37,649	79
	Female	15,550	24
Healthy Retirees	Male	19,310	684
	Female	13,032	449
Disabled Retirees	Male	454	17
	Female	87	7

Within each subgroup, there are more deaths for males because of the higher concentration of male participants in PMRS. Because of the higher credibility that the male experience provides, this data was considered first to determine the appropriate updated baseline mortality table to apply for each group.

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Because there is insufficient data for credible mortality experience, standard mortality tables will not be adjusted to "fit" the PMRS death rates. Furthermore, the A/E ratios and R-squared factor have less significance when setting this assumption. Instead, the general "shape" of the graphs is considered against various standard mortality tables.

In addition, ASOP No. 27 states the actuary may want to consider the "use of different assumptions for different segments of the covered population", which for PMRS might mean Non-Uniformed and Uniform plans. However, if death rates are further divided in the table above for participants from Non-Uniformed and Uniform plans, there will be even less credible data to determine the appropriate mortality tables. Therefore, the mortality assumptions are not subdivided into further subgroups.

Based on ASOP No. 27, "The actuary should reflect the effect of mortality improvement both before and after the measurement date." Therefore, when setting the mortality assumption, the first step is to determine the base table to fit the actual mortality rates from the past experience. There have been many studies of mortality rates published in recent years, most recently in 2025, the Public Sector 2016 (PUB-2016) Male/Female Report was published. These tables are based on public sector retirement data, which is recommended for public sector plans. Therefore, we recommend using the sex-distinct PUB-2016 mortality tables as the proposed base tables.

There is a correlation between mortality rates and the pension amount a retiree receives. The PUB-2016 mortality tables reflect a median amount of pension benefits that the retirees are assumed to receive and provide alternative tables for either "below median" and "above median" pension benefits. The weighted average 2016 monthly median male/female pension benefit for the PUB-2016 Uniform/Non-Uniform tables is $2,075 (based on the PMRS Uniform/Non-Uniform and male/female data). The average monthly 2016 retirement benefit for PMRS is about $1,300, which is below this average. Therefore, we recommend using a "below median" PUB-2016 mortality table as supported by the data.

For the healthy annuitant review, these tables were compared to the benefits-weighted (or amounts-weighted) death rates from PMRS over the Study Period. Benefits-weighted death rates provide a weighted rate associated with a death of a participant based on the amount of their benefit. Benefits-weighted death rates are considered to provide a better estimate for the future rates of death for a pension plan.

The second step is to add future mortality improvements. Mortality improvement scales are used to project the ongoing decline in mortality rates. The most recent improvement scale is MP-2021.

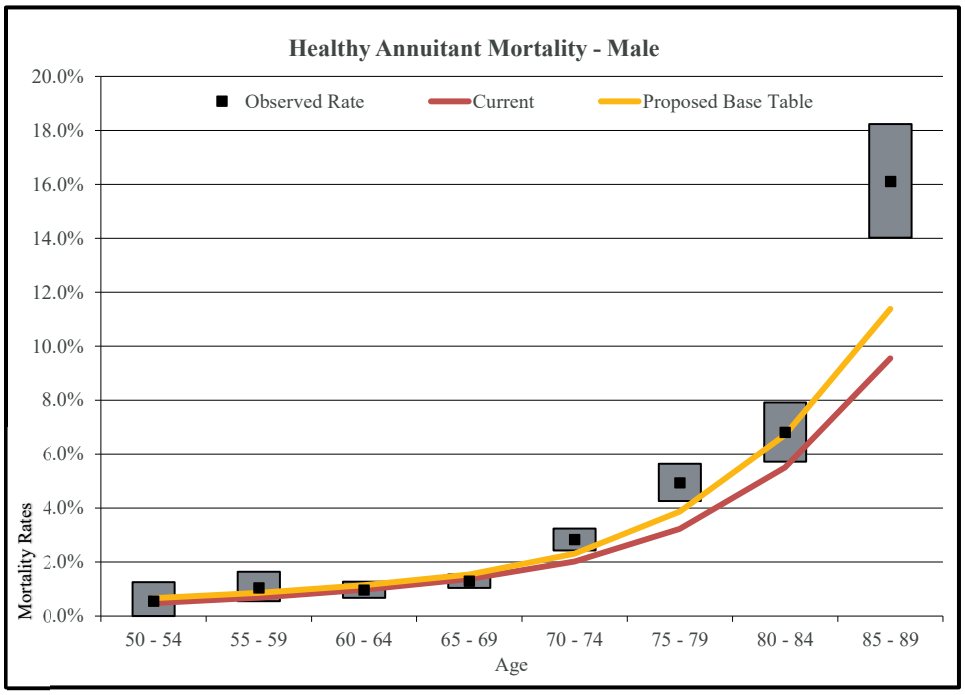
Fully generational mortality tables adjust for mortality based on birth year and can account for future improvements in mortality rates. For example, a participant that was born in 1930 is expected to live a shorter lifespan on average than a participant born in 1960 due to medical advancements. A fully generational table attempts to capture this additional variation in longevity to improve the accuracy of the projected benefit payments. Due to this improved accuracy, more pension plans are moving to these fully generational tables. We recommend using a fully generational mortality improvement table.

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Healthy Retired Participants

The male retiree group provides the most credible data for the death rates at PMRS. The proposed table is the Public Sector 2016 (PUB-2016) General Healthy Annuitant Male, below median, mortality improvements with MP-2021 fully generational. The table shown reflects the MP-2021 mortality improvements projected to the middle of the experience study period (i.e. 2021).

Chart II-9



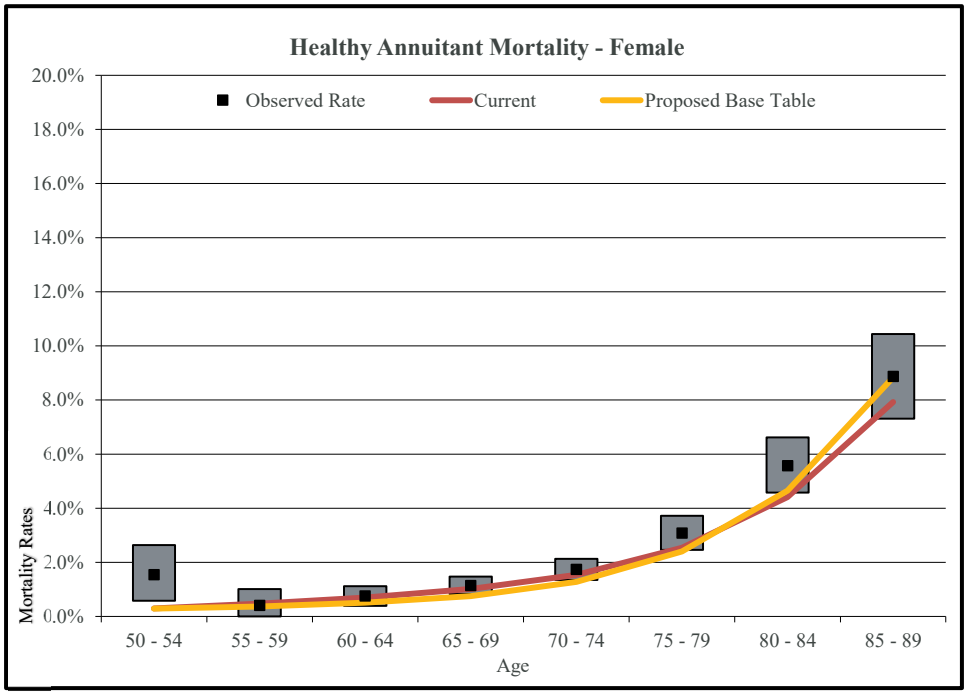
Assumption	A/E Ratio	R-Squared
Current	129%	78%
Proposed	111%	79%

While the proposed table appears to have higher mortality rates than the current assumptions, the rates above do not reflect the generational mortality improvements that will be applied in the actuarial valuation. Therefore, the final rates used in the actuarial valuation will be lower than the rates provided above.

The female retiree group is based on a fewer number of retirees compared to the males, but this still appears to have credible data at most data intervals. The proposed table is Public Sector 2016 General Healthy Annuitant Female, below median, mortality improvements with MP-2021 fully generational. The table shown only reflects the MP-2021 mortality improvements projected to the middle of the experience study period (i.e. 2021) to provide a comparable review of death rates from January 1, 2019 through December 31, 2023.

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Chart II-10



Assumption	A/E Ratio	R-Squared
Current	118%	70%
Proposed	121%	66%

The proposed table does not significantly change the A/E ratio nor the R-Squared factor. However, because the PUB-2016 male annuitant below median table provides a good fit for the most credible mortality data set for PMRS (as shown above in Chart II-9) and these tables are the most recently published information for the mortality rates, the selection is the PUB-2016 female annuitant below median mortality tables.

Non-annuitant (actives and terminated vested participants)

For the non-annuitant population, the credibility of experience is too low for these groups to develop a recommendation. Non-annuitant deaths over the past 5 years totaled 103 out of the exposed population of over 53,000. Therefore, we recommend that the non-annuitant mortality table is based on the same mortality study used to develop the healthy retiree basis.

The proposed table shown are the Public Sector 2016 General Employee Male or Female, below median, mortality improvements with MP-2021 projected to 2021 (for the following graphs).

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Chart II-11

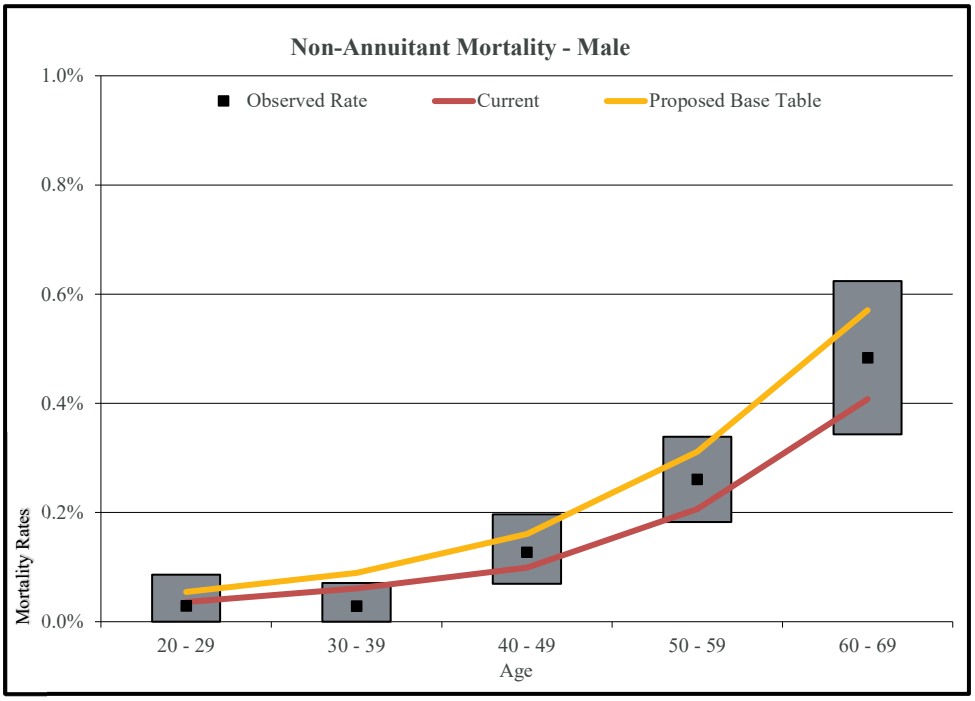
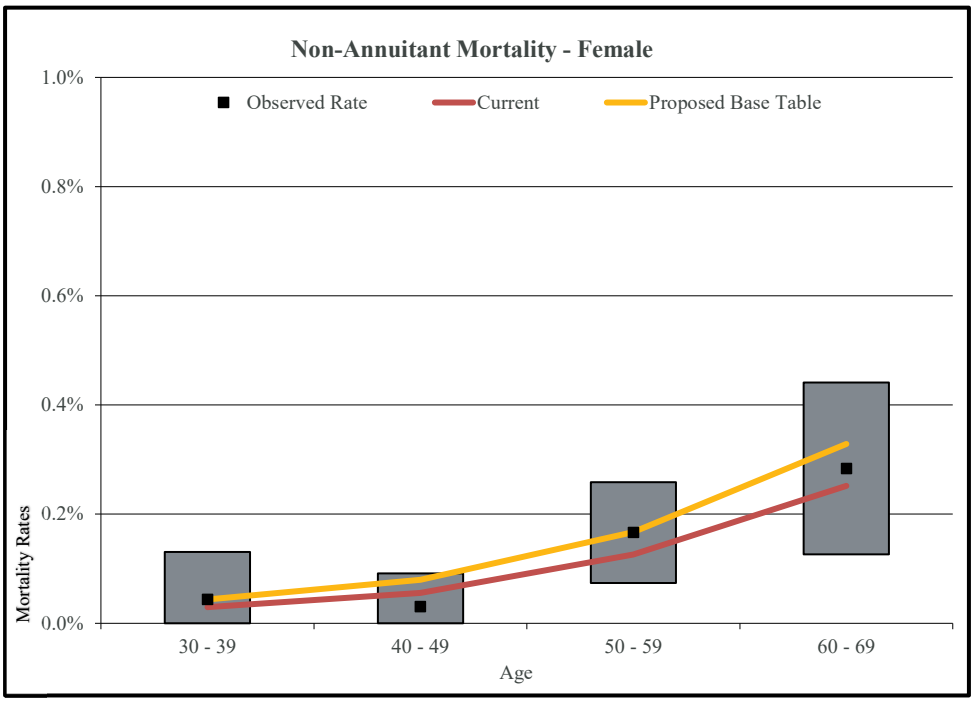


Chart II-12



SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Disabled Retirees (Annuitants)

Mortality for disabled annuitants provides an even smaller group to analyze actual versus expected experience at individual age groups as shown for healthy mortality. Therefore, we recommend that the disabled mortality tables are based on the same mortality study used to develop the healthy retiree basis, but using the disability death rates. As such, we recommend using the Public Sector 2016 Disabled Annuitant Male or Female Tables mortality improvements with MP-2021 fully generational. The disabled annuitant mortality tables do not have a below median rate option.

The following summarizes the proposed sex-distinct mortality tables:

Participant Type	Base Table Name	Mortality Improvements	Improvement Projections
Healthy Actives* (Non-Annuitants)	PUB-2016 General Employee table, below median amounts weighted	MP-2021	Fully Generational
Healthy Retirees (Annuitants)	PUB-2016 General Annuitant table, below median amounts weighted	MP-2021	Fully Generational
Disabled Retirees (Annuitants)	PUB-2016 General Disabled Annuitant table, amounts weighted	MP-2021	Fully Generational

*Includes terminated vested participants

C. Data Tables

The following tables provide the analysis associated with the previously shown annuitant graphs which provide the most credible data for this review. The A/E ratio is less important than basing the tables on the best fit for the most credible dataset and applying the other mortality tables as applicable to the other groups.

Table II-9

Healthy Annuitant Mortality - Base Table for Males								
Age Band	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths			A/E Ratios	
				Actual	Current	Proposed	Current	Proposed
50 - 54	479	7	782,789	4,283	3,708	5,145	116%	83%
55 - 59	917	9	2,198,899	22,864	14,737	18,844	155%	121%
60 - 64	2,981	34	6,269,969	60,255	60,757	71,486	99%	84%
65 - 69	5,304	71	10,067,771	129,992	138,471	155,260	94%	84%
70 - 74	4,418	144	7,444,632	210,333	150,515	171,771	140%	122%
75 - 79	2,678	128	3,654,244	180,160	117,897	141,503	153%	127%
80 - 84	1,416	108	1,640,693	111,569	90,356	110,156	123%	101%
85 - 89	784	109	809,014	130,301	77,289	92,128	169%	141%
90 - 94	266	55	227,778	45,067	36,899	42,171	122%	107%
95 +	65	17	45,045	13,481	11,033	12,251	122%	110%
Total	**19,308**	**682**	**33,140,835**	**908,306**	**701,663**	**820,714**	**129%**	**111%**

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

Table II-10

Healthy Annuitant Mortality - Base Table for Females								
Age Band	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths			A/E Ratios	
				Actual	Current	Proposed	Current	Proposed
50 - 54	341	3	263,326	4,058	788	753	515%	539%
55 - 59	496	2	644,904	2,622	3,033	2,390	86%	110%
60 - 64	1,524	13	2,053,296	15,517	14,391	10,436	108%	149%
65 - 69	2,776	34	3,602,170	41,008	36,531	27,003	112%	152%
70 - 74	2,818	47	3,150,765	54,604	48,392	40,175	113%	136%
75 - 79	2,153	77	2,139,792	65,953	54,284	51,432	121%	128%
80 - 84	1,421	74	1,234,542	68,817	54,467	57,352	126%	120%
85 - 89	862	81	708,601	62,887	56,183	62,623	112%	100%
90 - 94	463	66	321,871	46,502	43,796	48,517	106%	96%
95 +	152	47	89,657	27,228	19,140	19,880	142%	137%
Total	**13,006**	**444**	**14,208,923**	**389,197**	**331,005**	**320,561**	**118%**	**121%**

SECTION II – ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

5. Marriage Percentage and Spouse's Age

All benefits under PMRS are actuarially equivalent. Therefore, when a member retires, if an alternative form of payment is elected, PMRS determines the actuarially benefit based on the member's information. For the actuarial valuation, an assumption is applied for the percent of married members and spouse's age.

A. Current Assumptions

Currently, it is assumed that 85% of male and 65% of female active employees are married at the time they retire. The associated husbands are three years older than their wives. This assumption is used to determine the estimated conversion factors applied to future retirees that elect a joint and survivor benefit option or for plans where the joint and survivor benefit is the normal form of payment.

B. Experience and Proposed Assumptions

The experience shows that 77% of male retirees are married and 64% of female retirees are married.

On average, husbands are 2.4 years older than their wives.

The proposed marriage assumption is that 80% of male participants are married and 65% of female participants are married. The proposed assumption is to not change the age difference assumption for married participants.

6. Population Composition Percentages

A. Current Assumptions

Currently, it is assumed that the overall population for PMRS is 70% male and 30% female. While this assumption is not used explicitly for the actuarial valuations, this is used to determine the blended male/female unisex mortality table applied by PMRS for administration of the System. For example, this blended unisex table is used to convert pension benefits to optional forms of payment and to convert cash balance accounts to annuity pension benefits.

B. Experience and Proposed Assumptions

For the overall PMRS population, there are 72% male participants and 28% female participants. Therefore, it is proposed to make no changes in the population composition assumption at this time.

SECTION III – ANALYSIS OF ECONOMIC ASSUMPTIONS

The following economic assumptions are included in this analysis:

1. Inflation/Cost of Living Rate (if applicable)
2. Salary Increase
3. Discount Rate

Both the discount rate and salary increase assumptions are interrelated with inflation. Inflation is also the basis for the cost of living increase rate for plans that provide this. The discount rate (or rate of investment return) consists of two components: the "real rate" of return and inflation. Similarly, the rate of salary increase is separated into different components: inflation and merit increases (inclusive of promotional increases).

While the discount rate is not reviewed in this report, we provide an outline of the process reviewed each year by the Board to determine whether a change in this assumption is needed.

1. Inflation

A. Current Assumptions

Inflation is a building-block of all economic assumptions. This means that all economic assumptions, either directly or indirectly, are impacted by inflation. It is also the assumption used to project cost-of-living increases for those municipalities that provide this benefit. The current rate of inflation is 2.2%.

Social Security Taxable Wage Base (as applicable) is assumed to be 50 basis points above the assumed inflation rate.

B. Experience

(i) General Historical Experience

Based on the Consumer Price Index for All Urban Consumers U.S. City Average (all items) (CPI-U), Table III-1 shows the inflation rates for the past 30 years:

SECTION III – ANALYSIS OF ECONOMIC ASSUMPTIONS

Table III-1

Year Ending December 31	Increase in CPI	Year Ending December 31	Increase in CPI
1995	2.80%	2010	1.60%
1996	2.90%	2011	3.20%
1997	2.30%	2012	2.10%
1998	1.60%	2013	1.50%
1999	2.20%	2014	1.60%
2000	3.40%	2015	0.10%
2001	2.80%	2016	1.30%
2002	1.60%	2017	2.10%
2003	2.30%	2018	2.40%
2004	2.70%	2019	1.80%
2005	3.40%	2020	1.20%
2006	3.20%	2021	4.70%
2007	2.90%	2022	8.00%
2008	3.80%	2023	4.10%
2009	-0.40%	2024	2.90%

This table provides the average CPI-U over different historical time horizons.

Table III-2

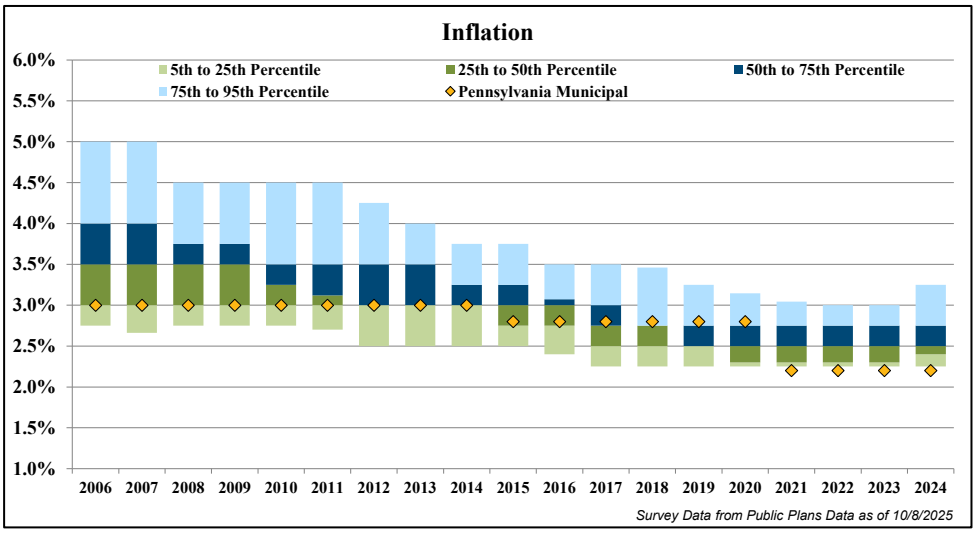
CPI averages through March 2025		
Time Period	Number of Years	Compound Average
2021 - 2025	5	4.20%
2016 - 2025	10	2.90%
2011 - 2025	15	2.60%
2006 - 2025	20	2.60%
2001 - 2025	25	2.60%
1996 - 2025	30	2.50%

The CPI reviewed during the previous experience study was at a relatively historic low level compared to the rates in the past. However, since the last experience study, inflation rates have risen.

SECTION III – ANALYSIS OF ECONOMIC ASSUMPTIONS

(ii) Other Public Sector Plans

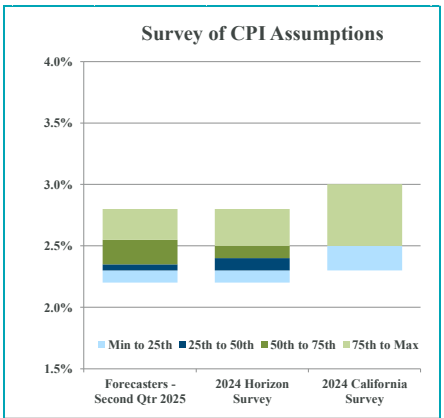
Chart III-1



Survey data from the Public Plan Database shows that the median inflation assumption has remained at 2.5% for the past 5 years.

Furthermore, the following chart below shows the distribution of the professionals' forecasts for average inflation over the next 10 years compared to the assumptions from the Horizon Actuarial Services Survey of Capital Market Assumptions (2024 Edition), and Cheiron's 2024 internal survey of California public pension plans.

Chart III-2



	Forecasters - Second Qtr 2025	2024 Horizon Survey	2024 California Survey
Minimum	2.20%	2.20%	2.30%
25th	2.30%	2.30%	2.50%
50th	2.35%	2.40%	2.50%
75th	2.55%	2.50%	2.50%
Maximum	2.80%	2.80%	3.00%

C. Proposed Assumption

Based on the historical data, recent surveys, and a review of the inflation assumption for other public sector plans, we recommend updating this assumption from 2.20% to 2.50%.

SECTION III – ANALYSIS OF ECONOMIC ASSUMPTIONS

2. Salary Increase

A. Current Assumptions

The current salary increase assumption for all employees is based on the following table:

Table III-3
Salary Scale

Age	Total Rate* (including inflation)
25	6.22%
30	5.16%
35	4.49%
40	4.14%
45	3.82%
50	3.55%
55	3.28%
60	3.11%
65	2.79%

**Add 3% for each of the first 2 years of service, 2% for the next 2 years of service, and 1% for the following 2 years of service. No merit increases assumed for 2021 and 2022. Additional 6% increase before retirement.*

This is an age-based table with decreasing rates as participants become older. There are three components of the current salary scale assumption:

(i) Early Employment Year Increases – additional increases for the first six years of employment as outlined above. This indicates that there are higher increases in the salary for the early employment years and is referred to a select period for these increases.

(ii) Merit and Promotional Increases – to review this component of salary scale increases, the inflation rate is removed and pay increases are analyzed based on merit/promotions only

(iii) Prior to Retirement Increases – additional 6% increase assumed before retirement. This estimates salary loading behavior that participants may use before retirement.

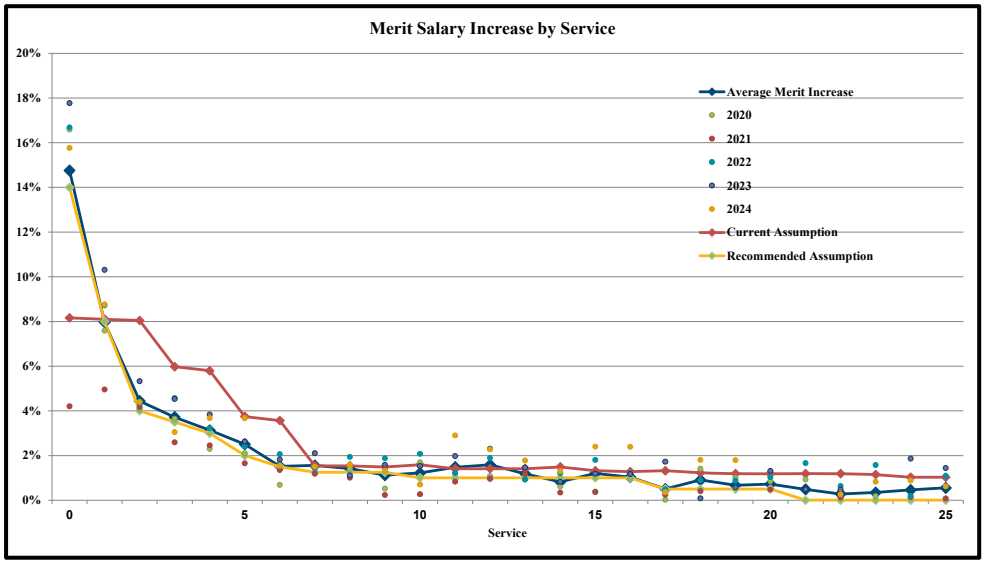
B. Experience and Proposed Assumptions

Salary Scale – Service Based

After reviewing the salary increases for PMRS by age and then by service, we suggest changing the assumptions to be based on service only. The following graph represents the merit pay increases after reducing total pay increases by the estimated wage inflation for the year.

SECTION III – ANALYSIS OF ECONOMIC ASSUMPTIONS

Chart III-3

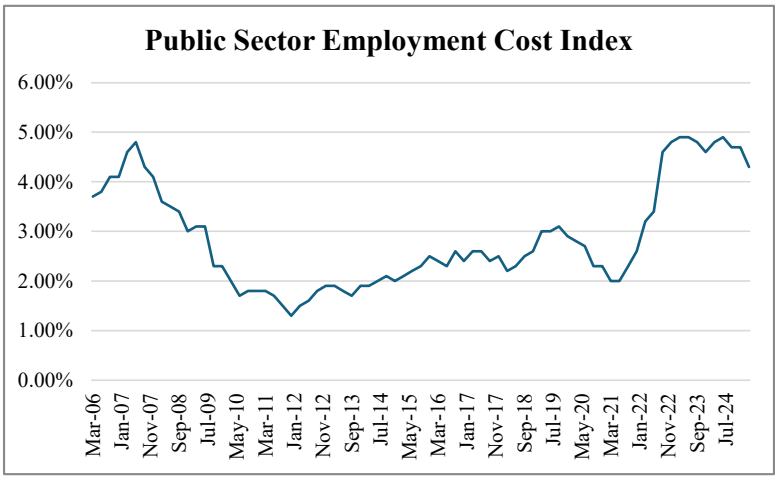


Dots represent individual data by year, with different colors for each year. The blue line represents the average merit increase for all years in the Study Period.

Salary Scale – Wage Inflation

Wage inflation can be considered an annual across-the-board increase in wages and tends to exceed inflation by some margin. The Employment Cost Index (ECI) measures the change in the hourly labor cost to employers over time as shown by the solid line in the following table.

Chart III-4



The average Employment Cost Index from March 2006 through May 2025 is about 2.75%. We recommend a wage inflation assumption of 2.75% (2.5% inflation + 0.25% margin).

Salary Scale – Prior to Retirement

The current salary scale assumption in the year prior to normal retirement is that pay will increase an additional 6%. This assumption is not included in the experience study because the final year of pay is often not included in the valuation data. Based on PMRS feedback confirming this salary experience, we propose maintaining the existing assumption.

3. Discount Rate

The discount rate, also referred to as the regular interest rate, is reviewed each year by the PMRS Pension Board, typically in the fall, following a robust process. The following outlines the process applied for this review annually.

A. Current Assumptions

PMRS's assets are assumed to earn 5.50% net of expenses for the measurement of liabilities effective with the January 1, 2025 valuation.

Under the Pennsylvania Municipal Retirement Law Act 15 of 1974 (PMRL), the PMRS Board is required to set the discount rate, which is also referred to as the "regular interest rate" in the PMRL. This is also referred to as the "investment rate" or the "crediting rate." Per the law, the regular interest rate is applied for the upcoming year to credit municipal and member accounts and used to calculate the actuarial liabilities for the upcoming valuation to determine the funding requirements.

The Board undertakes a comprehensive review of this assumption to determine if a change is needed for the following year. This annual review considers the following:

- Interest Rate Review Tool
- Probability of Future Asset Returns
- Other considerations

Interest Rate Review Tool

This tool was first developed to assist the Board with setting the regular interest rates once GASB 67/68 reporting was required starting in 2013. It incorporates PMRS specific details and blends long-term expected returns for active participants and short-term annuity rates for retirees. This is used as a rough proxy of possible rates if the assets associated with retirees were immunized with either insurance rates, as published by the Pension Benefit Guaranty Corporation (PBGC), or invested in long corporate bonds.

Inflation is an implicit building block of this tool because it is an underlying assumption associated with these rates and the long-term expected rate of return. As inflation has declined in the past years, these rates have declined as well.

SECTION III – ANALYSIS OF ECONOMIC ASSUMPTIONS

Probability of Future Asset Returns

The probability of the assets earning the assumed investment return is also considered by the Board to set the discount rate. The following table illustrates the confidence intervals of the expected investment return achieving each rate, as reviewed with the Board in September 2024.

Table III-4

Confidence Interval	Expected Return* per Confidence Interval						
	2018	2019	2020	2021	2022	2023	2024
95%	3.3%	3.5%	2.8%	2.2%	4.3%	4.2%	4.1%
90	4.4	4.4	3.9	3.1	5.0	4.9	4.9
85	5.0	5.1	4.6	3.8	5.3	5.5	5.3
80	5.6	5.7	5.1	4.3	5.7	5.9	5.7
75	6.0	6.1	5.5	4.7	6.1	6.1	6.0
70	6.5	6.5	5.9	5.1	6.4	6.5	6.4
50	7.9	7.9	7.3	6.4	7.3	7.4	7.3

* Confidence intervals of gross returns as of January 1 of each year, in the fall of each prior year. Based on the 20-year annualized returns provided by Dahab Associates prior to 2022, and 30-year assumption of returns provided by Marquette beginning in 2022

Other Considerations

One consideration for the Board is the ratio of the PMRS Market Value of Assets (MVA) to the PMRS Actuarial Value of Assets (AVA). If the MVA is less than the AVA, then there is a gap which can only be filled currently by investment returns exceeding the regular interest rate. This may be more likely to be achieved if the regular interest rate is reduced. Another consideration is reducing the investment volatility, which would also reduce the discount rate and fluctuating gaps between the MVA and the AVA ratio in the future.

B. Experience

(i) Historical Experience in General

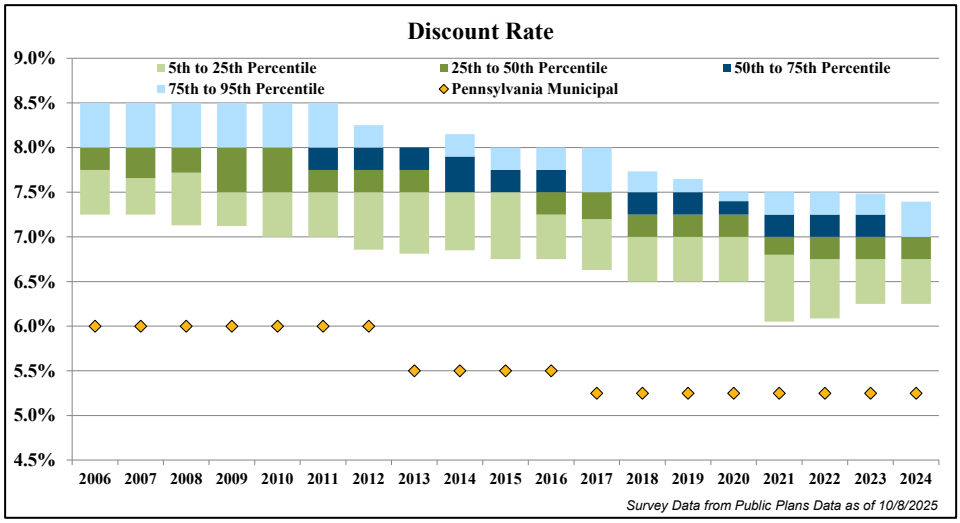
When the PMRS Board reviews this assumption, the current economic climate is considered.

(ii) Other Public Sector Plans

The findings from the Public Fund Survey as published by the National Association of State Retirement Administrators (NASRA) in the Research Update as of June 2025 show that the median investment return used by public sector plans has been trending lower over the period shown.

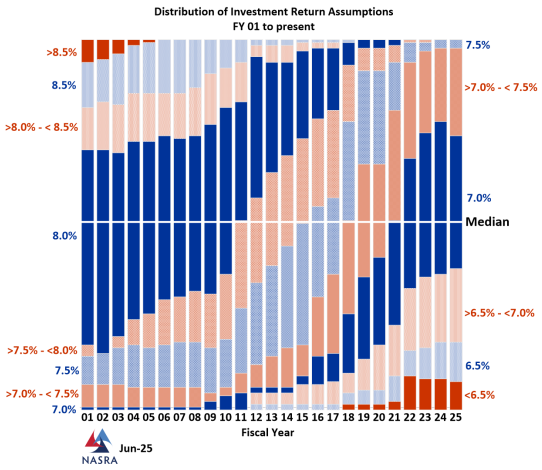
SECTION III – ANALYSIS OF ECONOMIC ASSUMPTIONS

Chart III-5



The gold diamonds on the graph indicate PMRS's historical discount rate compared to other public sector plans. *PMRS's discount rate is much lower because it is used to credit the member and municipal accounts each year in the calculation of the actuarial asset value without regard to the actual investment return. This is a unique feature to this system.*

Chart III-6



Because PMRS is crediting a defined investment return, this assumption be considered on a regular basis in terms of the long-term risk of the assumption and the capacity of PMRS to continue to provide this level of return to its members. *Although it is common to compare the discount rate to other public sector systems, for PMRS this comparison is not as relevant as it would be for other public sector plans because very few public sector plans credit asset accounts at the selected discount rate each year.*

C. Results

The discount rate is reviewed annually with the Board, as outlined above; therefore, this report does not provide a proposed future assumption.

APPENDIX A – CURRENT ACTUARIAL ASSUMPTIONS

Current Actuarial Assumptions from January 1, 2021 through December 31, 2025:

The current PMRS actuarial assumptions used in this study are as follows.

1. **Healthy Life Mortality:**

   Rates of Pre-Retirement Mortality
   Males: PUB-2010 General Employees male table
   Females: PUB-2010 General Employees female table

   Type of Death:
   (a) 20% of pre-retirement deaths are assumed to be service related for non-uniform plans, and
   (b) 70% of pre-retirement deaths are assumed to be service related for uniform plans.

   Rates of Post-Retirement Mortality
   Males: RP-2006 annuitant male table
   Females: RP-2006 annuitant female table

2. **Disabled Life Mortality Rates:**

   Males: RP-2006 disabled annuitant male table
   Females: RP-2006 disabled annuitant female table

3. **Mortality Improvement:**

   All base mortality tables described above are projected from the applicable table's base year to 2023 using Mortality Improvement Scale MP-2018

4. **Termination Rates Before Retirement**

Non-Uniform Participants		
	Number of Active Members in Plan	
Service	<25	25+
<1	11.0%	12.0%
1	11.0%	12.0%
2	10.0%	11.0%
3	9.0%	10.0%
4	8.0%	9.0%
5	7.0%	7.5%
6	8.0%	7.5%
7	6.0%	7.0%
8	5.0%	6.0%
9	4.0%	5.0%
10+	3.0%	3.5%

APPENDIX A – CURRENT ACTUARIAL ASSUMPTIONS

Participants in Uniformed Plans

Service	Termination Rates
<4	10.0%
5	5.0%
6	4.0%
7	4.0%
8	4.0%
9	3.0%
10+	3.0%

5. **Disability Incidence Rates:**

   50% of the 2017 CalPERS Public Miscellaneous Group disability rates for males. Sample rates are:

Age	Rate
25	0.0085%
35	0.0245%
45	0.0955%
55	0.1105%
65	0.1050%

   Type of Disability:

   (a) 20% of disablements are assumed to be service related for non-uniformed plans, and

   (b) 70% of disablements are assumed to be service related for uniform plans.

6. **Workers Compensation:** Service-related disability benefits payable from non-uniform plans are offset by 25% of final average salary.

7. **Salary Scale:**
   Inflation rate of 2.2% plus merit-based increases, as shown below for select ages. For 2021 and 2022, merit-based increases are assumed to be 0%.

Age	Total Rate[1] (including inflation)
25	6.22%
30	5.16%
35	4.49%
40	4.14%
45	3.82%
50	3.55%
55	3.28%
60	3.11%
65	2.79%

[1] *Add 3% for each of the first 2 years of service, 2% for years 3 and 4, and 1% for years 5 and 6*

APPENDIX A – CURRENT ACTUARIAL ASSUMPTIONS

8. Rates of Retirement:

(a) Non-Uniform Members:

Members are assumed to retire over a range of ages as shown below.

Age	Rate[1]		Age	Rate[1]
<55	33%		63	18%
55	30%		64	15%
56 – 57	12%		65 – 67	25%
58 – 59	14%		68 – 70	20%
60	18%		71 – 73	22%
61	10%		74	20%
62	20%		75	100%

[1]*Rates indicated are adjusted by adding 10% for ages 61-63 and 5% for ages 64-70 for the year in which the member is first eligible for normal retirement.*

(b) Uniform Members:

Members are assumed to retire over a range of ages as shown below.

Age	Rate		Age	Rate
<49	0%		62	28%
50	25%		63	22%
51 – 53	10%		64	25%
54 – 55	15%		65	35%
56 – 58	17%		66	30%
59 – 60	15%		67+	100%
61	20%			

For any members participating in a Deferred Retirement Option Program (DROP), the participant's date of entry into the DROP is considered the retirement date.

Reduced early retirement benefits are actuarially equivalent to the accrued benefit payable at normal retirement, so no early retirement is assumed.

9. DROP (Deferred Retirement Option Plans) or In-Service Distribution Plan:

For plans with these options, at Participant's Normal Retirement Age, retirement rate multiplied by the following factors:

(a) Uniform: 130%

(b) Non-uniform: 115%

APPENDIX A – CURRENT ACTUARIAL ASSUMPTIONS

10. **Marital Status and Spouse's Age (if applicable):** For plans with the 50% Joint & Survivor form of payment, 85% of active male members and 65% of active female members are assumed to be married. Male spouses are assumed to be three years older than female spouses.

11. **Post-Retirement Cost of Living Increases (if applicable)/Inflation:** 2.2% per year, subject to plan limitations.

APPENDIX B – NEW ACTUARIAL ASSUMPTIONS AS OF JANUARY 1, 2026

New Actuarial Assumptions:

The proposed PMRS actuarial assumptions developed in this study are as follows.

1. **Healthy Life Mortality:**

Pre-Retirement Mortality
Males: PUB-2016 General Employee Male below median amounts-weighted, mortality improvements with MP-2021 fully generational

Females: PUB-2016 General Employee Female below median amounts-weighted, mortality improvements with MP-2021 fully generational

Sample PUB-2016 General Employee Mortality Rates

Age	Male	Female
20	0.00028	0.00011
30	0.00061	0.00026
40	0.00099	0.00054
50	0.00217	0.00116
60	0.00467	0.00252

Post-Retirement Mortality
Males: PUB-2016 General Healthy Annuitant Male below median amounts-weighted, mortality improvements with MP-2021 fully generational

Females: PUB-2016 General Healthy Annuitant Female below median amounts-weighted, mortality improvements with MP-2021 fully generational

Sample PUB-2016 General Healthy Annuitant Mortality Rates

Age	Male	Female
50	0.00604	0.00286
60	0.00988	0.00428
70	0.01968	0.01057
80	0.05706	0.03727
90	0.16429	0.12980

Killed-in-Service Related Mortality Rates:

(a) 20% of active deaths are assumed to be service related for non-uniform plans

(b) 70% of active deaths are assumed to be service related for uniform plans

APPENDIX B – NEW ACTUARIAL ASSUMPTIONS AS OF JANUARY 1, 2026

2. Disabled Life Mortality Rates:

Males: PUB-2016 Disabled Annuitant Male Table, mortality improvements with MP-2021 fully generational

Females: PUB-2016 Disabled Annuitant Female Table, mortality improvements with MP-2021 fully generational

Sample PUB-2016 General Disabled Annuitant Mortality Rates, amounts-weighted

Age	Male	Female
40	0.00383	0.00320
50	0.00865	0.00733
60	0.02016	0.01698
70	0.02831	0.02256
80	0.06446	0.05742

3. Termination Rates Before Normal Retirement Eligibility

Non-Uniform Plans	
Service	Rates for All Plan Sizes
<1	14.00%
1	12.75%
2	11.50%
3	10.25%
4	9.00%
5	7.75%
6	6.50%
7	5.25%
8 – 9	4.00%
10 – 15	3.50%
16 – 18	2.50%
19+	1.50%

Uniform Plans	
Service	Rates for All Plan Sizes
<1	12.00%
1 – 3	11.00%
4 – 7	6.00%
8 – 11	3.00%
12	6.00%
13	4.50%
14 – 19	3.00%
20+	2.00%

APPENDIX B – NEW ACTUARIAL ASSUMPTIONS AS OF JANUARY 1, 2026

4. Disability Incidence Rates:

50% of the 2017 CalPERS Public Miscellaneous Group disability rate table for males. Sample rates are:

Age	Rate
25	0.0085%
35	0.0245%
45	0.0955%
55	0.1105%
65	0.1050%

(a) Service Related Disability Rates:

(i) 20% of disablements are assumed to be service related for non-uniform plans,

(ii) 70% of disablements are assumed to be service related for uniform plans

5. Workers Compensation: Service-related disability benefits are offset by 22% of final average salary and assumed to end at age 65 for all plans that have a workers compensation offset.

6. Salary Scale:

Service	Total Rate (merit only)
0	14.00%
1	8.00%
2	4.00%
3	3.50%
4	3.00%
5	2.00%
6	1.50%
7 – 9	1.25%
10 – 16	1.00%
17 – 20	0.50%
21+	0.00%

Wage inflation: 2.75%; includes Wage Inflation Margin of 0.25%
Prior to retirement, additional 6% wage increase is assumed.

APPENDIX B – NEW ACTUARIAL ASSUMPTIONS AS OF JANUARY 1, 2026

7. Rates of Retirement:

(a) Non-Uniform Members:

Upon First Eligibility for Normal Retirement:

Age	Non-DROP Rate	DROP Rate
<60	13.5%	14.9%
60 – 61	18.8%	20.6%
62	20.3%	22.3%
63	18.8%	20.6%
64	24.0%	26.4%
65	33.8%	37.1%
66	48.8%	53.6%
67-70	33.8%	37.1%
71-74	30.0%	33.0%
75+	100.0%	100.0%

After First Eligibility for Normal Retirement:

Age	Non-DROP Rate	DROP Rate
<60	9.0%	9.9%
60 – 61	12.5%	13.8%
62	13.5%	14.9%
63	12.5%	13.8%
64	16.0%	17.6%
65	22.5%	24.8%
66	32.5%	35.8%
67-70	22.5%	24.8%
70-74	20.0%	22.0%
75+	100.0%	100.0%

APPENDIX B – NEW ACTUARIAL ASSUMPTIONS AS OF JANUARY 1, 2026

(b) Uniform Members:

Members are assumed to retire over a range of ages as shown below.

Age	Non-DROP Rate	DROP Rate
<49	0%	0%
50	30%	35%
51	20%	25%
52 – 55	15%	25%
56 – 59	10%	25%
60 – 61	20%	25%
62 – 64	20%	35%
65-67	30%	35%
68+	100%	100%

8. **Marital Status and Spouse's Age (if applicable):** 80% of male active members are assumed to be married while 65% of female active members are assumed to be married. Male spouses are assumed to be three years-older than female spouses.

9. **Post-Retirement Cost of Living Increases (if applicable)/Inflation:** 2.5% per year, subject to plan limitations.