

Commonwealth of Pennsylvania State Employees' Retirement System

19th Investigation of Actuarial Experience
January 1, 2015 to December 31, 2019

July 29, 2020





**Nineteenth Investigation of Actuarial Experience of the State Employees'
Retirement System of the Commonwealth of Pennsylvania
Review of Experience from January 1, 2015 to December 31, 2019**

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I. Introduction & Executive Summary

Introduction

This is the nineteenth in a series of investigations of actuarial experience of the State Employees' Retirement System (SERS) for the Commonwealth of Pennsylvania. This report is based upon economic and demographic experience from January 1, 2015 through December 31, 2019. A periodic review of actuarial experience is essential if a retirement system is to be financed on a sound basis. The Commonwealth has formally recognized this need in Section 5902(j) of the State Employees' Retirement Code:

The board shall have the actuary make an annual valuation of the various accounts within six months of the close of each calendar year. In the year 1975 and in every fifth year thereafter the board shall have the actuary conduct an actuarial investigation and evaluation of the system based on data including the mortality, service, and compensation experience provided by the board annually during the preceding five years concerning the members and beneficiaries. The board shall by resolution adopt such tables as are necessary for the actuarial valuation of the fund and calculation of contributions, annuities and other benefits based on the reports and recommendations of the actuary.

A retirement system operates on a sound actuarial basis when the funds on hand, together with the expected future contributions, are sufficient to cover the value of future promised benefit payments. Each year the actuary projects the expected value of future benefits and the stream of contributions needed to meet the benefit payments. The projection serves as a basis for the determination of the needed employer contributions to the retirement fund. The projection is based on a wide variety of economic assumptions, such as assumed investment returns, and demographic assumptions, such as rates of mortality. Since both the economic and demographic experience change over time, it is essential to conduct a periodic review of the experience and to adjust the assumptions in the valuation to take into account the most recent experience as well as the actuary's expectations for the future.

Economic assumptions include the rates of investment return and salary growth. Both the nominal investment return and salary growth are affected by the general rate of inflation. In periods of low inflation, salary increases will typically be smaller, with a greater emphasis on promotions and longevity, whereas in times of rapid price increases, salary increases will be larger, to keep pace with salaries of other employers competing for talent, and to maintain purchasing power. The development of these rates therefore includes an investigation of the underlying inflation and expectations for future inflation. These relatively few rates, compared to the large number of demographic assumptions, generally have the most significant effect on the estimate of future contributions. General economic forces, instead of the specific experience of the retirement system, are often given more consideration when setting an investment return, or salary growth assumption.

Demographic assumptions include the set of rates that predict certain events occurring to a group of employees or annuitants. Events of significance to a retirement system are those that result in a commencement or termination of a benefit payment. The events affecting active employees include reasons for leaving the system such as retirement, becoming disabled, terminating service, or death. The events affecting annuitants include death. If an annuitant would return to service, or if a disabled



annuitant were to recover from disability, the benefit payments to the annuitant would stop. However, these events are not included in the analysis because the occurrences of these events are rare, and would not materially affect the calculation of the decrement rates.

It is general practice to introduce some degree of conservatism in setting actuarial assumptions. However, the degree of conservatism varies widely among pension plans. Some plans set assumptions so that the pension plan contributions will be at least as great as the contributions needed in the most adverse foreseeable circumstances. Other systems set assumptions that are close to the actual experience but conservative enough to protect against small deviations from past experience. The latter – a moderately conservative approach – has been used by the SERS Board and the recommended rates in this evaluation were developed on that basis.

The Actuarial Standards Board has issued standards (Actuarial Standards of Practice or ASOPs) on the selection of demographic and economic assumptions. These standards are revised from time to time to address emerging practice. The specific ASOPs that have guided Korn Ferry in performing this study and formulating recommended changes to the actuarial valuation assumptions for SERS are as follows:

- ASOP No. 27 – Selection of Economic Assumptions for Measuring Pension Obligations and
- ASOP No. 35 – Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

Contents of this report:

- Section II of this report provides background information relating to this actuarial experience investigation.
- Section III presents the results of the review of the economic experience and discusses the basis for the recommended economic assumptions.
- Section IV presents the results of the analysis of the demographic experience, and the basis for the recommended demographic assumptions.
- Section V presents the results of other experience analyses we have performed (such as optional form election rates) and our conclusions regarding the related actuarial assumptions.
- Section VI provides information relating to the cost impact of Korn Ferry's recommendations and includes some closing remarks.
- Section VII provides the Actuarial Certification for the report.
- Section VIII defines certain terms used in this report.
- The Appendix, including Tables A-1 through A-23, provides a full set of recommended assumptions, all of which will become effective with Korn Ferry's December 31, 2020 actuarial valuation.
- Following the Appendix are tables of the detailed results of the many separate studies undertaken by Korn Ferry that underlie this 2015-2019 Actuarial Experience Study.

The following Executive Summary provides an overview of Korn Ferry's findings and recommendations.



Executive Summary

The basic objective of this analysis is to develop economic and demographic assumptions in accordance with the expected future experience of the System. In general, it is good actuarial practice to select actuarial valuation assumptions taking into account the System’s actual experience over the recent past.

Economic Experience

The most important set of rates in the valuation is the set of economic assumptions that include the prediction of future rates of investment return and general salary increases. The assumed rates of investment return and general salary increases are both driven by the underlying rate of inflation. Based upon our analysis of SERS’ past economic experience and our expectations for the future (as discussed in detail in Section III of this report), we recommend that:

- The current investment return assumption of 7.125 percent per year (compounded annually) be reduced to 7.00 percent per year (compounded annually),
- The current inflation assumption of 2.60 percent per year (compounded annually) be reduced to 2.50 percent per year (compounded annually),
- The current general salary increase assumption of 2.9 percent per year (compounded annually) be reduced to 2.8 percent per year (compounded annually) and
- The current career salary increase assumptions (which vary by length of service) be reduced by varying amounts depending upon the employee’s length of service at all service levels.

Note that the actuarial valuation assumes that future salary growth will be the total of assumed increases in the general salary schedule (across-the-board increases) plus assumed career salary growth (via promotion and longevity increases).

Table I-1 below shows, for the first three recommendations listed above, (i) Korn Ferry’s recommended assumptions, (ii) the current assumptions and (iii) the prior assumptions, which were utilized over the preceding eleven years of actuarial valuations (from 2008 through 2018).

Table I-1 Recommended vs. Current vs. Prior Economic Assumptions					
	Annual Inflation	Investment Return		Salary Growth	
		Nominal	Real¹	Nominal	Real
Recommended	2.50%	7.00%	4.4%	2.8%	0.3%
Current – 2019	2.60%	7.125%	4.4%	2.9%	0.3%
Prior 2016 – 2018	2.60%	7.25%	4.5%	2.9%	0.3%
Prior 2011 – 2015	2.75%	7.50%	4.6%	3.05%	0.3%
Prior 2010	2.75%	8.00%	5.1%	3.05%	0.3%
Prior 2008 & 2009	3.00%	8.00%	4.9%	3.30%	0.3%

¹ The real investment return and real salary growth rate are determined using the formula $(1+real) = (1+nominal)/(1+inflation)$. The rates shown are annual rates.



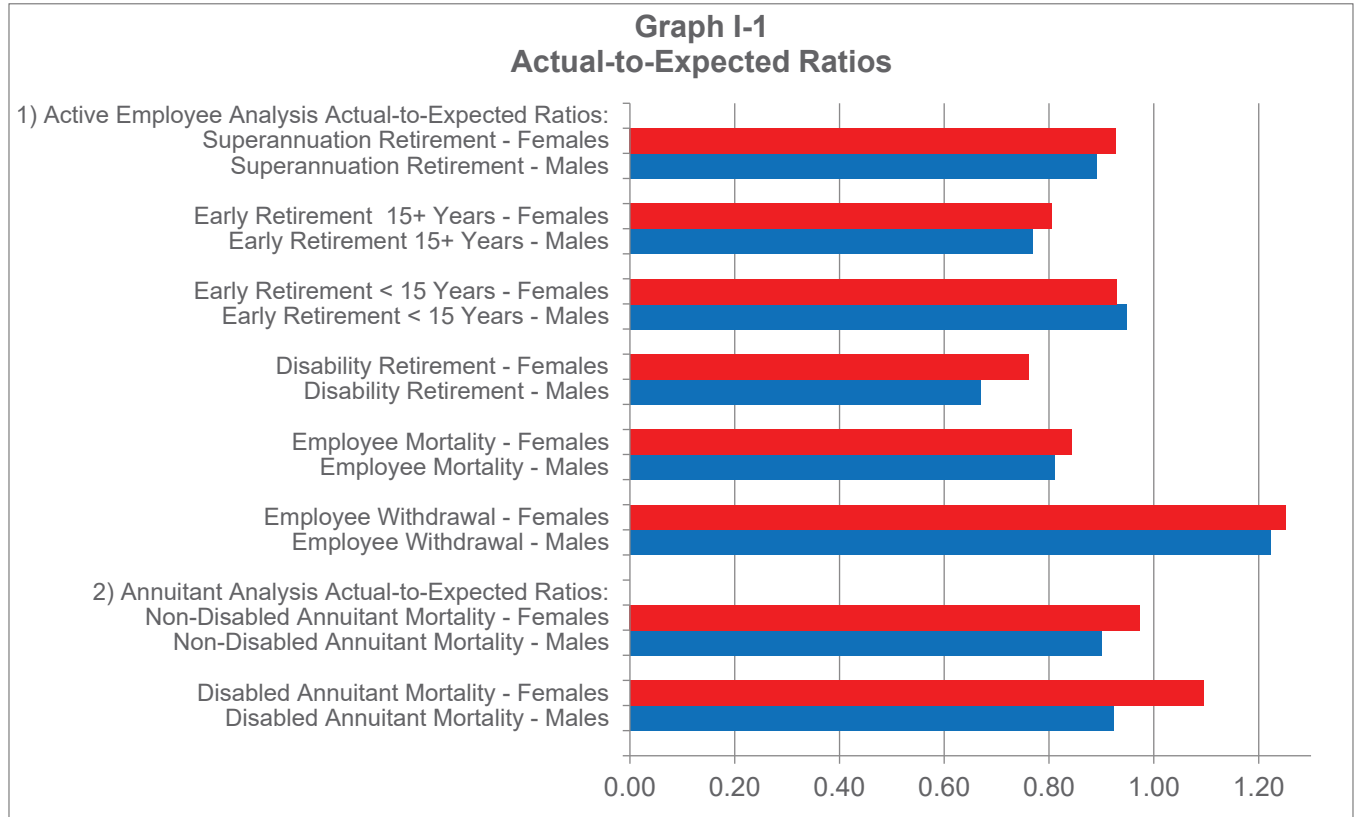
For the specific service-related reductions we are recommending to the salary increase assumptions, per the fourth recommendation listed above, see Table A-1 of the Appendix.

Demographic Experience

Development of demographic actuarial assumptions begins with the analysis of actual experience to expected experience, and the calculation of the actual-to-expected ratio. The actual-to-expected ratio gives a measure of how closely the assumption predicted what actually happened. If the actual-to-expected ratio is greater than 1.0, then the actuarial assumption under-predicted; if the actual-to-expected ratio is less than 1.0, then the assumption over-predicted the number of occurrences. The product of the analysis is a set of recommended actuarial assumptions that produce an actual-to-expected ratio close to 1.0, based on actual experience, unless circumstances warrant a deviation.

The analysis was performed separately for each category of membership expected to have unique patterns of termination experience. The general employees (i.e., those in Classes AA, A, A-3 and A-4) comprise close to 78 percent of the membership of SERS. The remaining 22 percent comprise the State Police, members of the General Assembly, members of the judiciary, and other members eligible to retire at age 50.

The actual-to-expected ratios for our general employee analyses (including members of Classes AA, A, A-3 and A-4) are shown graphically below in Graph I-1.





Demographic Experience Observations and Assumption Recommendations

In general and as indicated in Graph I-1, the experience was close to expected for 4 of the 8 studies we undertook relating to the general employee and annuitant populations. That is, actual to expected ratios for both males and females were generally in the range of 90% to 110% for the following studies:

- Superannuation retirement,
- Early retirement after less than 15 years of service,
- Non-disabled annuitant mortality, and
- Disabled annuitant mortality.

For the remaining 4 studies, the experience deviated more from our expectations, as follows:

- We observed only about 80% as many early retirements after 15 or more years of service as were expected,
- We observed only about 70-75% as many disability retirements as were expected,
- In-service deaths (i.e., active employee mortality) were at about 80% of expected levels and
- The numbers of employee withdrawals (turnover) ran about 20% more than expected.

Before summarizing Korn Ferry's demographic assumption change recommendations, it is important that we explain how (i) Class A-3 and Class A-4 general employees (all of whom were hired after 2010) and (ii) Class A-5 and Class A-6 general employees (all of whom were hired after 2018) were handled in our demographic experience studies:

Handling of Class A-3 and Class A-4 General Employees

- Since these employees are subject to the same rates of disability, mortality and separation from service due to withdrawal (turnover prior to eligibility for retirement) as the Class AA and Class A general employees, their experience was included in our studies of these three active employee assumptions.
- The retirement benefit provisions (for both superannuation and early retirement) applicable to these employees differ from those applicable to Class AA and Class A general employees, and different superannuation and early retirement rates apply. We included the Class A-3 and A-4 retirement experience in our retirement studies; however, with relatively few having reached retirement eligibility, they had little impact on the study results.
- As was true in 2011 and 2016, when our last two actuarial experience studies were performed, Act 120, the November 2010 legislation that created Classes A-3 and A-4, has still not been in place long enough for there to be sufficient retirement experience data available to establish new early retirement and superannuation retirement rates for this population. Nevertheless, as a part of this experience study, we did review the limited Class A-3/A-4 retirement experience that occurred over the 2015-2019 study period, and we found that just over 300 retirements occurred (most of whom were employees hired at older ages since 2010, who subsequently met the age 65 and 3 years of service superannuation requirements). In Korn Ferry's opinion, this was not a sufficient amount of experience to be used as a basis for recommending new Class A-3/A-4 retirement rates.
- Therefore, as we recommended at the time of our last (2016) experience study, Korn Ferry once again recommends the continued use of the Class A-3/A-4 retirement rates established during our 2011 experience study, as included in Tables A-20 and A-21, which were based



upon our past experience with SERS and our professional judgment. The Class A-3/A-4 retirement experience will continue to be segregated and analyzed in future experience studies; when there is sufficient retirement experience, these assumptions will be updated.

Handling of Class A-5 and Class A-6 General Employees

- The only Class A-5 or Class A-6 experience that was included in our studies would have been for the limited number of members (formerly Act 120 or pre-Act 120) who opted into the Act 2017-5 benefit provisions. All other Class A-5 or Class A-6 employees were hired during 2019, and were not included in our studies. This was due to the fact that our 5-year study period ended prior to their first anniversary of employment, so they did not meet the requirements to be included in our studies.
- Since the retirement benefit provisions (for both superannuation and early retirement) applicable to these employees differ from those applicable to Class AA, Class A, Class A-3 and Class A-4 general employees, different superannuation and early retirement rates apply; for purposes of Korn Ferry's December 31, 2019 actuarial valuation, we created and used Class A-5/A-6 retirement rates, which (similar to the Class A-3/A-4 rates discussed above) were based upon our past experience with SERS and our professional judgment.
- Korn Ferry recommends the continued use of these same Class A-5/A-6 retirement rates, as included in Tables A-22 and A-23, in future SERS valuations. When there is sufficient actual Class A-5/A-6 retirement experience, these assumptions will be updated.

Korn Ferry is recommending the following changes to SERS' demographic assumptions:

- With respect to the assumptions applicable to all active employees:
 - Decreases (net) to mortality rates for both males and females (See Table A-2)
 - Decreases to disability retirement rates for both females and males (See Table A-3)
- With respect to the assumptions applicable to Class AA and Class A general employees:
 - Decreases in the superannuation rates for males at ages prior to 64 and for females at ages 60 through 64; increases in the superannuation rates for both females and males at ages after 64 (See Table A-4)
 - For both males and females with 15 or more years of service, decreases (net) to the early retirement rates (See Table A-5)
 - For both males and females with fewer than 15 years of service, slight decreases (net) to the early retirement rates (See Table A-6)
 - With respect to not only Classes AA and A, but also Classes A-3, A-4, A-5 and A-6 (but not applicable to special benefit classes), for both males and females, increases to the employee withdrawal rates applicable to most age and service durations, but decreases to rates applicable to some age and service durations (See Table A-7)
- With respect to the assumptions applicable to annuitants and survivors, adoption of new base mortality tables developed from the Society of Actuaries' Pub-2010 study of public sector retirement systems and the Society of Actuaries' most recent forecast of future (generational) mortality improvements, as follows:
 - Male Non-Disabled: PubG-2010 Male Retiree Mortality Table (See Table A-8), with post-2010 mortality improvement based on Scale MP-2019 for Males



- Female Non-Disabled: PubG-2010 Female Retiree Mortality Table, set forward 1 year (See Table A-8), with post-2010 mortality improvement based on Scale MP-2019 for Females
- Male Disabled: PubNS-2010 Male Disabled Retiree Mortality Table, set forward 2 years (See Table A-9), with post-2010 mortality improvement based on Scale MP-2019 for Males
- Female Disabled: PubNS-2010 Female Disabled Retiree Mortality Table, set forward 2 years (See Table A-9), with post-2010 mortality improvement based on Scale MP-2019 for Females

Korn Ferry also studied the 2015-2019 demographic experience of employees in special benefit classes, leading to the following additional demographic assumption recommendations:

- With respect to the superannuation rates applicable to active State Police, both males and females, increases (net) to the superannuation rates at service levels greater than 19 years (See Table A-10)
- With respect to the superannuation rates applicable to active Hazardous Duty Employees other than State Police, both males and females, slight increases (net) to the superannuation rates (See Table A-11)
- With respect to other assumptions applicable to active State Police and other Hazardous Duty Employees, both males and females:
 - Increases (net) to the early retirement rates (See Table A-12)
 - Increases (net) to the withdrawal rates (See Table A-13)
- With respect to the assumptions applicable to active Legislators, both males and females:
 - Slight increases (net) to the superannuation rates (See Table A-14)
 - Increases (net) to the early retirement rates (See Table A-15)
 - Decreases (net) to the withdrawal rates (See Table A-16)
- With respect to the assumptions applicable to active Judicial Officers, both males and females:
 - Decreases (net) to the superannuation rates (See Table A-17)
 - Decrease (net) to the early retirement rates (See Table A-18)
 - Increases (net) to the withdrawal rates (See Table A-19)

For the specific age-related or service-related assumption changes we are recommending, as listed above, generally including a comparison versus the current assumptions, see the tables referenced above in the Appendix to this report. For a table of contents listing all the rate tables included in the Appendix, see the first page of the Appendix.



II. Background

The specific objective of this actuarial investigation is the development of the following assumptions as to the expected experience of the System:

- the investment return of the fund, including the underlying inflation rate;
- the rates of salary increase among active members;
- the rates of mortality among active members and annuitants;
- the rates of disability among active members;
- the rates of superannuation retirement among active members;
- the rates of separation for other reasons among active members.

The analysis was performed separately for each category of membership expected to have unique patterns of termination experience:

- Class AA and Class A general employees eligible for full benefits at age 60 or with 35 years of service;
- State Police;
- other hazardous duty employees eligible to retire at age 50;
- members of the General Assembly;
- members of the judiciary.

See Page 5 for an explanation as to how Korn Ferry handled the 2015 to 2019 experience of Class A-3 and Class A-4 general employees for purposes of this actuarial investigation.

Age and Service Requirements for Superannuation (full formula benefits)

Class AA & Class A

General Conditions	Age 60 with three years of service; or 35 or more years of credited service, regardless of age.
Legislators and certain enforcement officers	Age 50 with three years of service.
Park Rangers & Capitol Police	Age 50 with 20 years of Park Ranger or Capitol Police service as a Park Ranger or a Capitol Police Officer.
State Police	Age 50. State Police are eligible for special unreduced benefits after 20 years of service, regardless of age; however, age 50 remains their superannuation age.
Other Hazardous Duty	Age 50 with three years of service.

Class D-4 Legislators

Age 50 with three years of service.

Class E-1 & Class E-2 Judges

Age 60 with three years of service; or 35 or more years of credited service, regardless of age.



III. Analysis of Economic Experience and Recommended Economic Assumptions

The most important set of rates in the valuation is the set of economic assumptions that include the prediction of future rates of investment return and general salary increases. The assumed rates of investment return and general salary increases are nominal rates and are therefore developed from an assessment of the underlying rate of inflation.

Both the investment return and salary growth affect the valuation results. For the 2019 valuation the investment return rate was reduced from 7.25 percent to 7.125 percent, while there was no change made at that time to the salary growth rate. Changes in the investment return assumption affect all liabilities, whereas changes in the salary scale only affect liabilities for current employees. If the salary increases are greater than expected, the benefits will grow in direct proportion because they are based on the final average salary. Conversely, a decrease in investment earnings will directly increase the employer contributions needed to pay the benefits. For SERS, an equal change in the two assumptions will change the normal cost and actuarial liabilities. For instance, decreasing both the investment return and salary growth assumptions by the same 0.5 percent will increase both the normal cost and the unfunded accrued liability.

The current assumptions and rates in effect over prior actuarial valuations are shown in Table III-1. The assumed general salary growth does not include individual career salary increases, due to promotions and longevity. These increases are covered in a later section. The real rate of investment return and the real rate of salary growth are derived by dividing the nominal rates by the rate of inflation. (For example, the current real investment return is $[1.07125 / 1.0260] - 1.0$, which is approximately 4.4%).

Table III-1 Current & Prior Economic Assumptions					
	Annual Inflation	Investment Return		Salary Growth	
		Nominal	Real	Nominal	Real
Current - 2019	2.60%	7.125%	4.4%	2.9%	0.3%
Prior 2016 – 2018	2.60%	7.25%	4.5%	2.9%	0.3%
Prior 2011 – 2015	2.75%	7.50%	4.6%	3.05%	0.3%
Prior 2010	2.75%	8.00%	5.1%	3.05%	0.3%
Prior 2008 & 2009	3.00%	8.00%	4.9%	3.30%	0.3%

Table III-2 below shows the rate of inflation, the nominal and real investment return based on the market value of assets and the nominal and real salary growth for the past twenty years. The rate of inflation is based upon the Consumer Price Index for all Urban Consumers (CPI-U), the U.S. City Average. The annual rate of inflation is calculated as the change in the index from December of the



previous year to December of the current year. For example, the CPI-U for December of 2010 was 219.2 and the CPI-U for December of 2011 was 225.7, which resulted in an annual inflation for 2011 of 3.0 percent $[(225.7/219.2) - 1 = 3.0\%]$.

Table III-2 Annual Rates of Growth					
Year	Inflation	Investment Return		Salary Growth	
		Nominal	Real	Nominal	Real
2000	3.4%	2.2%	(1.1)%	3.0%	(0.4)%
2001	1.6	(7.9)	(9.3)	3.3	1.7
2002	2.4	(10.9)	(13.0)	3.5	1.1
2003	1.9	24.3	22.0	2.0	0.1
2004	3.3	15.1	11.4	1.9	(1.4)
2005	3.4	14.5	10.7	3.0	(0.4)
2006	2.5	16.4	13.6	3.5	1.0
2007	4.1	17.2	12.6	2.8	(1.2)
2008	0.1	(28.7)	(28.8)	3.0	2.9
2009	2.7	9.1	6.2	3.0	0.3
2010	1.5	11.9	10.2	3.0	1.5
2011	3.0	2.7	(0.3)	3.0	0.0
2012	1.7	12.0	10.1	1.0	(0.7)
2013	1.5	13.6	11.9	2.8	1.3
2014	0.8	6.4	5.6	3.5	2.7
2015	0.7	0.4	(0.3)	3.4	2.7
2016	2.1	6.5	4.3	1.8	(0.3)
2017	2.1	15.1	12.7	4.7	2.5
2018	1.9	(4.6)	(6.4)	5.3	3.3
2019	2.3	18.8	16.1	4.8	2.4
Averages					
2015-2019 (5 years)	1.8	6.9	5.0	4.0	2.1
2010-2019 (10 years)	1.8	8.1	6.2	3.3	1.5
2005-2019 (15 years)	2.0	6.7	4.5	3.2	1.2
2000-2019 (20 years)	2.1	5.9	3.7	3.1	0.9



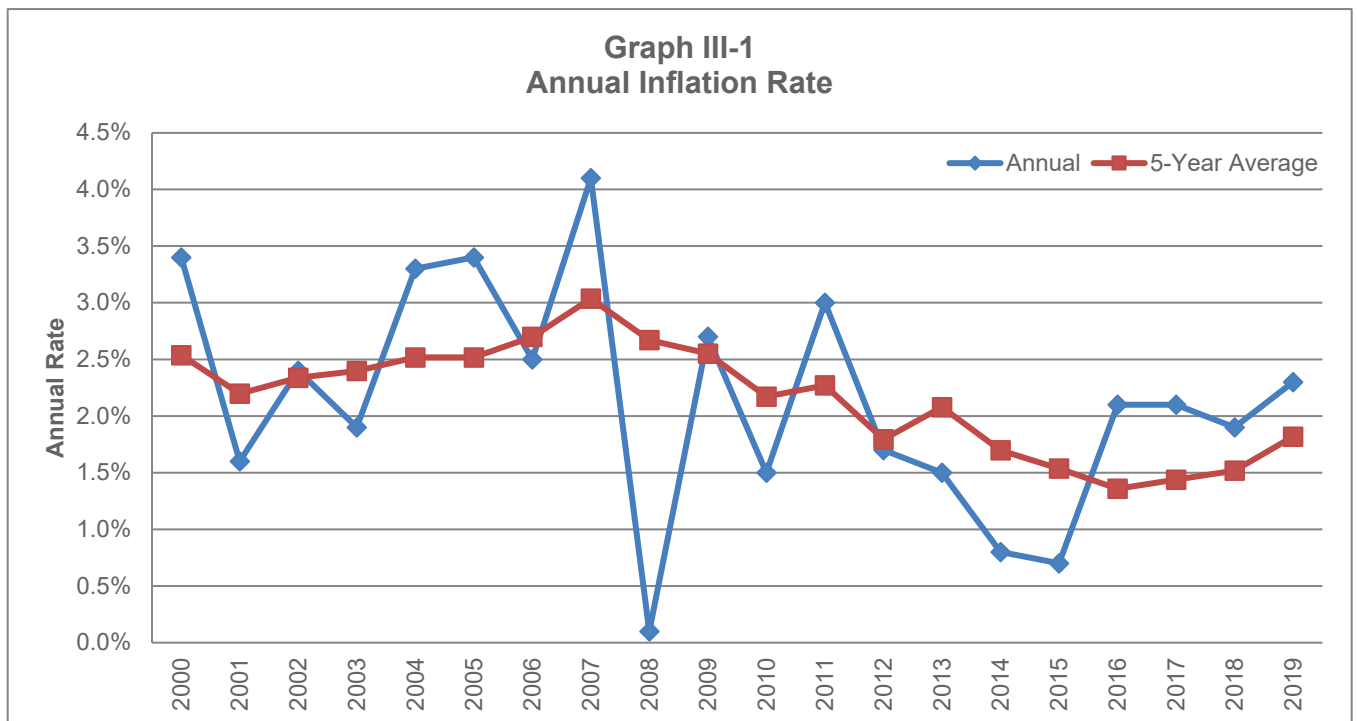
Inflation

While inflation does not directly affect SERS liabilities or assets (as it would if automatic COLAs applied under SERS), it is an important consideration in our review of both the investment return and general salary increase assumptions. There has been a gradual decline in inflation in the United States over the past 20 years, illustrated best by the downward trend of the rolling five-year average inflation rate (the red line) in the graph at the bottom of this page. As well, the graph indicates that, over the past 20 years, inflation in the U.S. has been relatively stable, with only one major fluctuation (a 1-year decrease of 4 percent, that occurred in connection with the 2008 economic downturn).

SERS investment consultant, Callan, included, among their 2020 Capital Market Assumptions, a U.S. annual inflation assumption of 2.25 percent. While we have given some consideration to this inflation forecast, we do not feel it projects far enough into the future for purposes of setting the inflation assumption for the SERS actuarial valuation. The Social Security Administration, for purposes of cost projections included in their most recent (2020) annual Trustees' Report (based upon their "intermediate assumptions"), projects future annual inflation will be at a rate of 2.4 percent. This was a 0.2 percent decrease from the assumption used in their 2019 report projections.

We believe, based upon historical inflation rates (as shown in Table III-2) and our current expectations for the future (giving significant credence to the inflation assumption change included in the 2020 Social Security Trustees Report), that it is appropriate to recommend a 0.1 percent reduction to the current SERS annual inflation assumption, from 2.60 percent to 2.50 percent.

As illustrated below in Graph III-1, while the annual inflation rate has ranged from a low of 0.1 percent to a high of 4.1 percent over the past 20 years, the rolling 5-year average has ranged only between 1.4 percent and 3.0 percent.

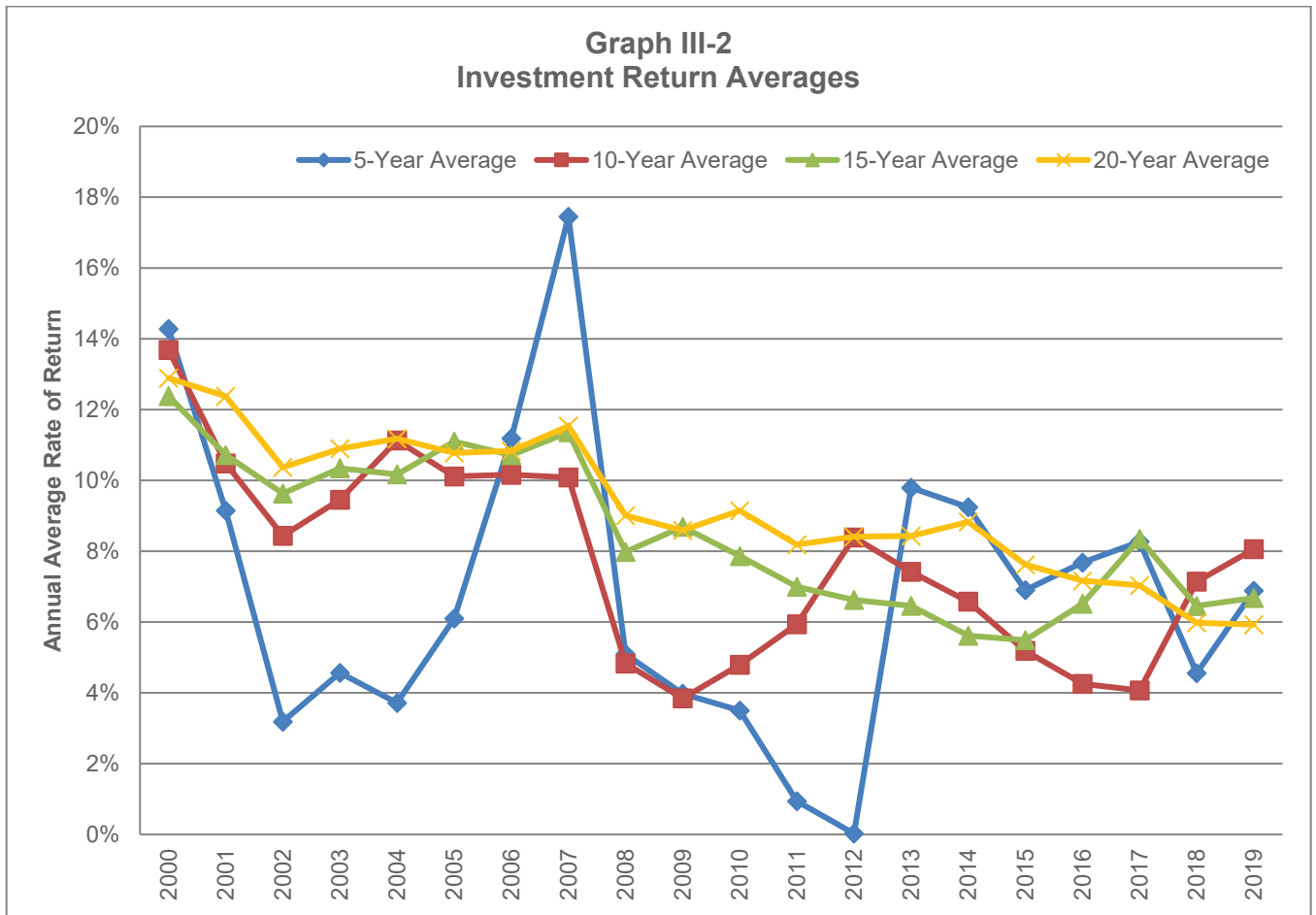




Investment Return

As shown in Table III-2, the 20-year, 15-year, 10-year and 5-year average annual rates of return were 5.9%, 6.7%, 8.1% and 6.9%, respectively. Of course, both the 15-year and 20-year averages were materially affected by the severe market decline of 2008.

The graph below shows that, while the annual investment return has ranged from a low in 2008 of minus 28.7 percent to a high in 2003 of 24.3 percent (as shown in Table III-2), the rolling 20-year average investment returns have ranged between 5.9 percent and 12.9 percent over the past twenty years.



It is important (and a widely-recognized best practice in pension funding) for the system actuary and general investment consultant to work as a team on an ongoing basis in connection with the annual determination of an appropriate investment return assumption for the actuarial valuation. Korn Ferry's discussions and collaboration with Callan during 2020 included Callan's preparation and presentation to the SERS Board of the three tables included on the following two pages, namely (i) Callan's 2020 capital market assumptions for SERS' asset classes, (ii) the current target allocations for SERS' portfolio and (iii) the probabilities Callan determined for SERS to achieve or exceed the recommended new 7.00% return assumption over coming time horizons. These assumptions are in nominal terms; that is, they include inflation (at Callan's assumed 2.25%/year, as shown at the bottom of the first table).



(i) **2020 Capital Market Projections – PA SERS Asset Classes**

Return and Risk 2020 - 2029

Asset Class	Index	PROJECTED RETURN			PROJECTED RISK
		1-Year Arithmetic	10-Year Geometric*	Real	Standard Deviation
Equities					
Broad Domestic Equity	Russell 3000	8.55%	7.15%	4.90%	18.10%
Developed Int'l Equity	MSCI World ex USA	8.70%	7.00%	4.75%	19.70%
Emerging Markets Equity	MSCI Emerging Markets	10.25%	7.25%	5.00%	25.70%
Alternatives					
Private Equity	Cambridge Private Equity	12.00%	8.50%	6.25%	27.80%
Custom Real Estate	Custom Benchmark*	9.25%	7.70%	5.45%	19.10%
Private Credit	Proxy	6.50%	5.90%	3.65%	12.10%
Fixed Income					
Core Fixed Income	Bloomberg Barclays Aggregate	2.80%	2.75%	0.50%	3.75%
TIPS	Bloomberg Barclays TIPS	2.50%	2.40%	0.15%	5.05%
Opportunistic Fixed Income	Custom Benchmark**	4.75%	4.55%	2.30%	7.65%
Cash equivalents					
Cash equivalents	90-Day T-Bill	2.25%	2.25%	0.00%	0.90%
Inflation					
	CPI-U	2.25%	2.25%	0.00%	1.50%

Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

*Custom Real Estate assumption = 35% Core Real Estate, 55% Opportunistic, 10% REITs

**Custom Opportunistic Fixed Income assumption = 34% EMD, 33% Levered Loans, 33% High Yield

(ii) **2020-2029 Investment Return Expectation – PA SERS Target**

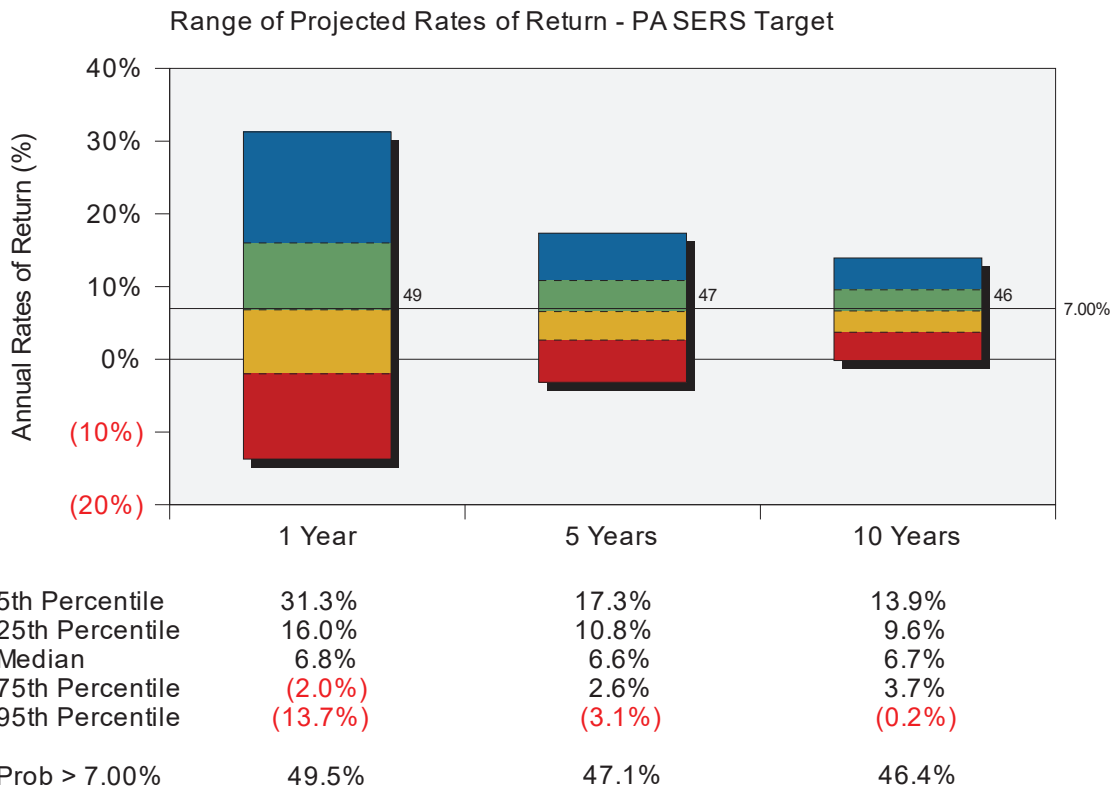
Portfolio Component	Target
Public Equity	
Broad Domestic Equity	25%
Developed Int'l Equity	13%
Emerging Markets Equity	4%
Private Equity	
	14%
Real Estate	
	8%
Private Credit	
	4%
Fixed Income	
Core Fixed Income	22%
TIPS	4%
Opportunistic Fixed Income	4%
Cash equivalents	2%
Total	100%
10-Yr. Compound Return	6.65%
Real Return (inflation adjusted)	4.40%
Projected Standard Deviation	12.98%

Current target is projected to generate a 10-year compound return of 6.65%, which translates to a real return of 4.40%.



(iii) 2020-2029 Investment Return Expectations – Probability of Achieving 7.0%

Range of Projected Returns – One, Five, and Ten Years



Probability of achieving or exceeding a 7.0% return assumption is closer to 50% across 1, 5 and 10 year horizons than for 7.125%

Source of (i), (ii) & (iii) above: Callan

Largely due to the longer future time horizon underlying the actuary’s economic assumptions (30 to 40 or more years) versus the horizon underlying the investment consultant’s investment return assumptions (5 to 10 years), as noted earlier, Korn Ferry assumes future U.S. inflation will be at a rate of 2.50% per year, whereas Callan assumes (per above) a rate of 2.25% per year.

With respect to the overall annual investment return assumption and the underlying assumed real return, per (ii) and (iii) above, Callan clearly communicated their professional comfort with both the 7.00% overall return assumption and the 4.4% real return assumption, thereby supporting the appropriateness of Korn Ferry’s new economic assumption recommendations.

Investment Return Assumptions Used by Other Large Public Plans

Another important factor to keep in mind as we consider the SERS investment return assumption is the range of investment return assumptions being used in actuarial valuations of other large public pension systems in the U.S. (most of which are state-wide retirement systems like SERS). The table below shows the distribution of annual investment return assumptions in use over time (from December 2011 to June 2020) by the 126 (or more) plans in the Public Fund Survey conducted by the National Association of State Retirement Administrators (NASRA). In each of the columns of Table III-3, the number that includes SERS is highlighted. Note that the number of plans with



assumed returns of 7.50 percent or lower has increased from 26 of 126 plans (21 percent of the total) in late 2011 to 119 of 130 plans (92 percent of the total) as of June 2020. As of June 2020, the median return assumption was 7.25 percent. After SERS' adoption of the new 7.00% return assumption effective with the December 31, 2020 actuarial valuation, based upon the June 2020 survey (and assuming no other systems revise their assumed returns), about 23 of 130 (or 18%) of these systems will be using an annual investment return assumption lower than SERS' 7.00%.

Table III-3 Number of Retirement Systems								
Assumed Return	Dec 2011	Dec 2013	Oct 2014	Feb 2016	Feb 2017	Feb 2018	Feb 2019	Jun 2020
8.01%-8.50%	23	4	9	4	3	1	0	0
8.00%	47	45	36	31	19	11	6	3
7.76%-7.99%	9	11	11	10	7	0	0	0
7.75%	21	17	14	18	14	11	9	3
7.51%-7.74%	0	3	4	4	12	13	5	5
7.50%	17	30	34	36	31	34	32	30
7.00%-7.49%								
7.45%	0	0	0	0	1	2	3	1
7.40%	0	0	0	0	1	1	4	4
7.375%	0	0	0	0	1	0	0	2
7.35%	0	0	0	0	0	0	2	1
7.30%	0	0	0	0	0	0	1	2
7.25%	2	7	7	7	15	19	20	18
7.20%	1	1	1	2	3	4	2	3
7.15%	0	0	0	0	0	1	1	1
7.125%	0	0	2	2	0	1	0	1
7.05-7.10%	0	0	0	0	0	1	0	1
7.00%	6	4	4	5	9	18	28	32
6.50% to 6.99%								
6.95%	0	0	0	0	0	1	1	2
6.90%	0	0	0	0	1	1	1	2
6.875%	0	0	0	0	2	2	0	0
6.80%	0	0	0	0	0	0	1	3
6.75%	0	2	2	5	5	3	7	9
6.70%	0	0	0	0	0	0	1	1
6.50%	0	2	2	2	3	3	3	4
< 6.50%								
6.25%	0	0	0	0	0	1	1	1
5.25%	0	0	0	0	0	1	1	1
Total Systems	126	126	126	126	127	129	129	130



Salary Experience

As the retirement benefit that SERS members receive is a final average salary based annuity, the salary increase assumption is a key valuation assumption. There are two components to the salary increase assumption: a general salary increase assumption that applies to all employees at all ages and points in their career and a career salary increase assumption. The general salary increase would be the expected increase for a member remaining in the same job, whereas the career salary increase reflects pay increases due to promotions and longevity.

General Salary Increase Assumption

The general salary increase assumption is the rate by which salaries are expected to increase each year. The assumption consists of an assumed inflation rate and an assumed real salary growth rate. The current assumptions are an assumed inflation rate of 2.60 percent and a real salary growth rate of 0.3 percent for a total of 2.90 percent. Consistent with our recommendation to reduce the long-term inflation assumption to 2.50 percent, we recommend reducing the current general salary increase assumption from the current 2.90 percent to 2.80 percent.

Both the current and the recommended economic assumptions are shown below in Table III-3.

Table III-3 Current & Recommended Economic Assumptions					
	Annual Inflation	Investment Return		Salary Growth	
		Nominal	Real	Nominal	Real
Recommended	2.50%	7.00%	4.4%	2.80%	0.3%
Current - 2019	2.60%	7.125%	4.4%	2.90%	0.3%

Career Salary Increase Assumption

For the experience analysis, we reviewed individual pay for all members who were active in any consecutive pair of years from 2015 to 2019. As we always do when performing our actuarial investigation of the SERS salary increase experience, we considered any unusual events that may have occurred during the 2015-2019 study period that could have distorted salary increase levels for all or any significant portion of the population under study. Having identified no such unusual events, we concluded that the salary increase data could be used in aggregate without adjustment.

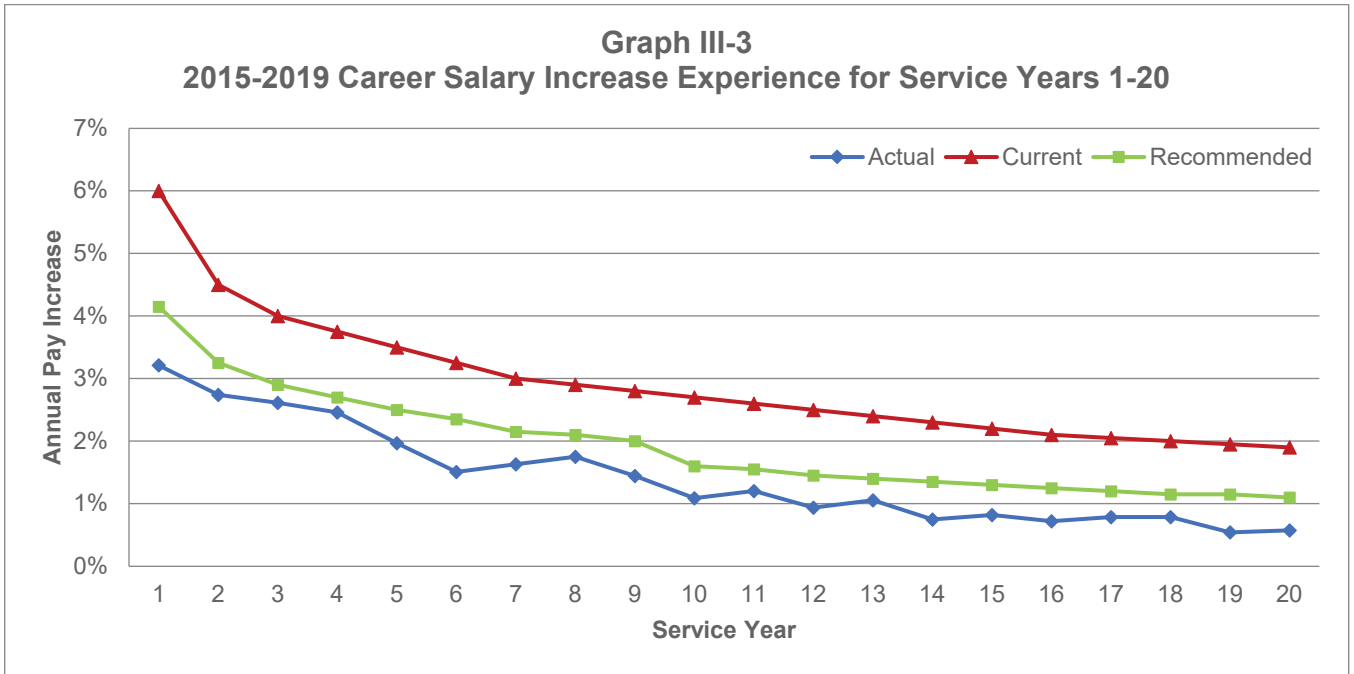
Since the actuarial valuation assumes that overall future salary growth will be the total of (i) assumed increases in the general salary schedule (across-the-board increases) plus (ii) assumed career salary growth (via promotion and longevity increases, and therefore varying by a member's length of service), our study of salary increase experience examined the pattern of actual 2015 to 2019 career salary increases, by length of service.

Graph III-3 shows the career salary increase experience for the experience period for the verified records for employees in their first 20 years of service and Graph III-4 shows the experience for employees with 20 to 40 years of service.

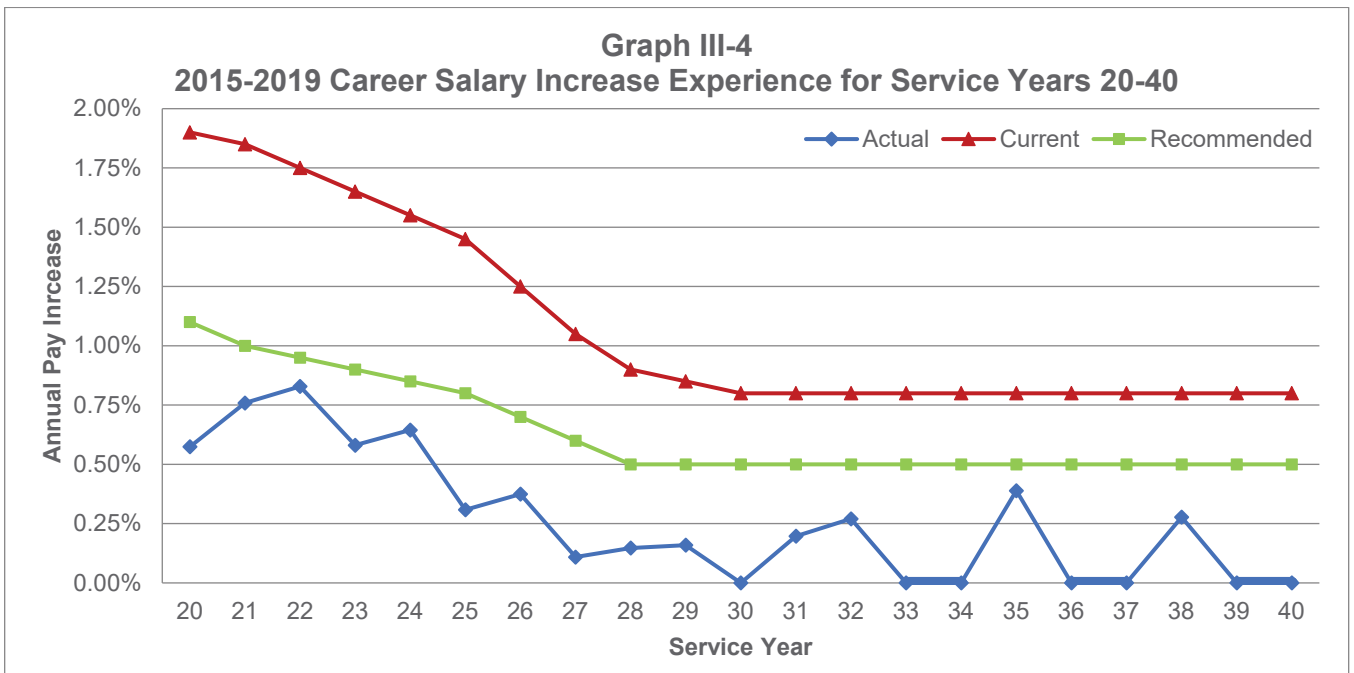
Graph III-3 below shows that the pattern of higher increases in the first years of employment continues; however, the rate of increase was much lower than expected (ranging from 1 to 3 percent



lower) for those in their first three years of employment. The pattern of the actual salary increases otherwise conforms well with the pattern of the current assumption, with actual increases generally running close to 1.5 percent lower than expected at all durations.



Graph III-4 on the next page shows that the pattern of increases for employees with more than 20 years of service also conforms rather well to the valuation assumption, again with actual increases generally running close to 0.5 to 1.0 percent lower than expected at all durations.





Based upon our career salary increase experience findings, as illustrated in Graphs III-3 and III-4, we recommend lowering the current career salary increase assumptions at all service levels. Our recommended career salary increase rates are shown in Table A-1 in the Appendix. The table shows the actual 2015-2019 career salary increase experience, the current total salary increase assumptions from general and career increases combined, the recommended total salary increase assumptions, the current career salary increase assumptions, and the recommended career salary increase assumptions.



IV. Analysis of Demographic Experience and Recommended Demographic Assumptions

The terminations from active employment for SERS participants are analyzed by four categories depending on the eligibility for SERS benefits:

- Deaths
- Disabilities
- Superannuation retirements
- Other separations from active employment

The terminations are split by the categories above to calculate the long-term rates to be used for the valuation.

The following sections describe the analysis of the demographic experience and show the results of the actual-to-expected experience analysis. The first section discusses the analysis and results for active Class AA and Class A general employees subject to age 60 superannuation, and the second section discusses the results for employees subject to different retirement provisions. The different eligibility rules for retirement do not affect the probability of death or disability, so these rates are the same for all classes. The final section describes the actual-to-expected analysis for retirees and survivors.

As a result of Act 120, Class A-3 and Class A-4 members (with original hire occurring after 2010) generally have longer requirements for vesting and retirement. Vesting for these classes is 10 years and superannuation is age 65 for most employees (and age 55 for certain categories of service). In the experience study, these members were valued using the vesting and retirement conditions that apply to them. See Page 5 for further explanation relating to Korn Ferry's handling of the 2015 to 2019 experience of this portion of the active employee population. It should be noted that the largest impact these members have is in studies involving non-vested separations; they have negligible impact in studies involving early retirement or superannuation. Therefore, the discussion going forward will generally focus on Classes AA and A.

Tables IV-1 through IV-6 below compare the actual terminations that have occurred in the 2015-2019 period to the expected results based on the current set of actuarial demographic assumptions used in the 2019 actuarial valuation. These actuarial demographic assumptions were based on the previous experience study. The actual-to-expected ratio is the actual terminations as a percent of the expected terminations. Total deaths among female employees, for instance, were 207, or approximately 84 percent of the 246 female employee deaths that would have been expected using the current valuation tables.

In general, we are recommending that the assumptions for the valuation for active employees be revised to more closely reflect the actual experience of the study period.

Analysis of Deaths

Members who die while on active duty are eligible for a death benefit. If the member had less than 5 years of credited service, the member's accumulated contributions are returned. If the member



was eligible to receive a retirement benefit, an eligible beneficiary or survivor will receive a benefit from SERS.

During the study period, there were 591 deaths. Based on the current assumptions, we would have expected 719 deaths during the 5 year period. The resulting actual-to-expected ratio was 0.82. The long-term rates for death are calculated separately for males and females. Table IV-1 shows the actual deaths, expected deaths based on the current rates, and expected deaths based on the recommended rates. Mortality of the overall U.S. population continues to improve so it is not surprising that the actual deaths during this recent period are lower than expected.

We propose to adjust the current rates to produce an actual-to-expected ratio close to 0.90. Unlike post-retirement mortality, lower mortality (fewer deaths) among active participants reduces benefits and benefit costs. Therefore, the somewhat higher death rates we are recommending are intended to be somewhat conservative.

Table IV-1 Employees Leaving Active Employment Because of Death				
	Actual Deaths	Expected Deaths	Ratio Actual-to-Expected	Ratio Actual-to-Recommended
	2015-2019	2015-2019	2015-2019	2015-2019
Female Deaths	207	246	0.84	0.90
Male Deaths	384	473	0.81	0.90
Total Deaths	591	719	0.82	0.90

Analysis of Disability Retirements

A member is eligible for disability retirement if the member is unable to perform his or her current job and has at least 5 years of service. A State Police or enforcement officer does not have a minimum service requirement.

The data on terminations included 1,143 disability retirements. However, 323 of those members were eligible for superannuation retirement based on their age and credited service at termination. Since there is no difference in benefit, we combined the disabled and non-disabled members who retire after superannuation into the superannuation rates. Therefore, the disability rates are based on the 820 members who became disabled before superannuation age.

The total number of disability retirement terminations included in this analysis was 820. We would have expected 1,144 disability retirements during the same period, based on the current assumptions. The actual disabilities were 28 percent fewer than expected. We recommend disability retirement rates that are closer to the actual experience of the disability retirements calculated separately for males and females. Table IV-2 shows the number of disability retirements, the expected disability retirements based on the current assumptions, the ratio of actual to expected based on the current assumptions, and the ratio based on the recommended rates.



Table IV-2 Employees Leaving Active Employment for Disability Retirement				
	Actual Disability Retirements	Expected Disability Retirements	Ratio Actual-to- Expected	Ratio Actual-to- Recommended
	2015-2019	2015-2019	2015-2019	2015-2019
Female Disabilities	455	598	0.76	0.90
Male Disabilities	365	546	0.67	0.90
Total Disabilities	820	1,144	0.72	0.90

Analysis of Superannuation Retirements - Class AA & Class A General Employees

Class AA and Class A general employees can retire and receive full formula benefits after attaining superannuation age. Superannuation age is defined as age 60 with three years of service. Members of Class AA and Class A with 35 or more years of credited service are entitled to full formula benefits regardless of age. As mentioned under the disability retirement analysis, members who terminated on a disability retirement, but were eligible for unreduced benefits at the time of disability were treated as superannuation retirements and included in that part of the analysis.

Table IV-3 below shows the actual superannuation retirements compared to the expected superannuation retirements based on the current assumptions.

Table IV-3 Employees Leaving Active Employment for Superannuation Retirement				
	Actual Superannuation Retirements	Expected Superannuation Retirements	Ratio Actual-to- Expected	Ratio Actual-to- Recommended
	2015-2019	2015-2019	2015-2019	2015-2019
Female Retirements	5,958	6,422	0.93	0.95
Male Retirements	6,450	7,242	0.89	0.95
Total Retirements	12,408	13,664	0.91	0.95

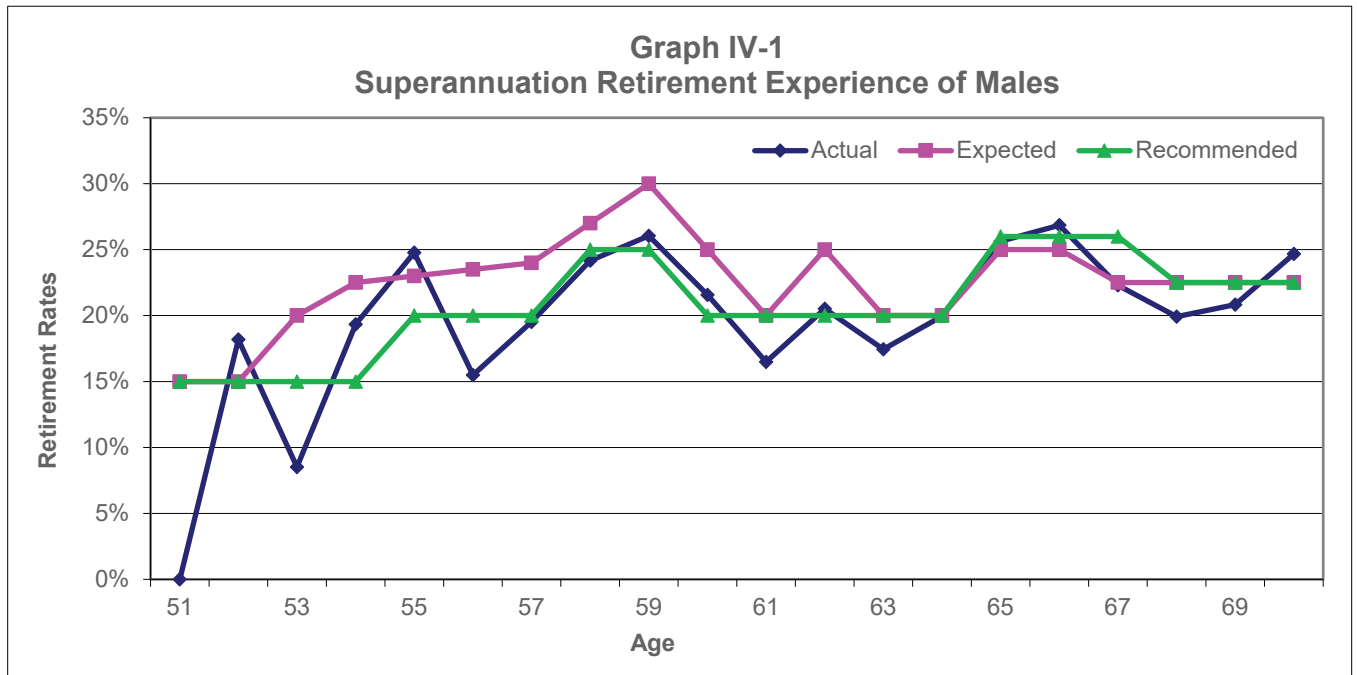
The overall experience was a lower number of retirements than expected, which implies employees are retiring later.

Table IV-4 Ratio of Actual to Expected Superannuation Retirements by Year						
	2015	2016	2017	2018	2019	Total
Ratio of Actual-to- Expected	0.92	0.92	0.85	0.91	0.95	0.91

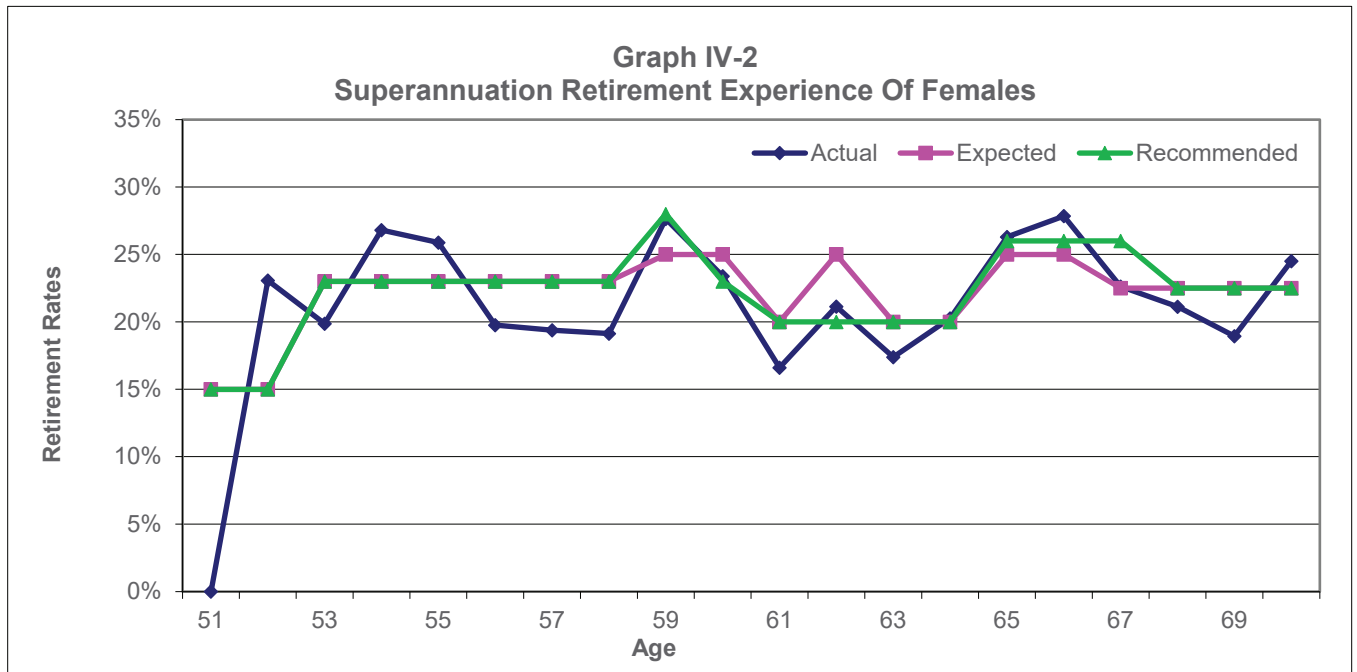
Our demographic experience studies that include all Class AA and Class A general employees (other than those in special benefit classes) are performed separately for each year of the five-year study period, to allow us to observe any possible individual year aberrations (e.g., one or more unusual years of experience), which may require some type of adjustment to our results/recommendations. The superannuation retirement experience shown above in Table IV-4 is an example of a very consistent year to year pattern, one which we would accept without any required adjustment.



The following charts show the retirement experience by age at retirement. The current assumption generally has higher rates around ages 60, 62 and 65 (Superannuation, Social Security Early Retirement Eligibility and Medicare Eligibility respectively).



In comparing the actual experience to the expected, relatively fewer employees are retiring at, or prior to, the earliest superannuation age and relatively more are deferring retirement until Social Security Normal Retirement Ages (65-66) or beyond. Although our recommended rates continue to anticipate “spikes” around ages 60, 62 and 65, they also attempt to capture the observed experience of members increasingly delaying retirement beyond their initial superannuation eligibility.





Consistent with the Male Superannuation graph (Graph IV-1) on the previous page, in comparing the actual female experience to the expected, again, relatively fewer employees are retiring at, or prior to, the earliest superannuation age and relatively more are deferring retirement until Social Security Normal Retirement Ages (65-66) or beyond. As with the male recommendations, our recommended rates for females continue to anticipate “spikes” around ages 60, 62 and 65, but they also attempt to capture the observed experience of members increasingly delaying retirement beyond their initial superannuation eligibility.

The recommended rates for Superannuation Retirement for general employees are shown in the Appendix in Table A-4.

Analysis of Other Separations from Active Employment – Class AA & Class A General Employees

Table IV-5 shows the ratio of actual to expected terminations for reasons other than death, disability or superannuation retirement. These rates would be expected to vary somewhat according to the economic cycle. Employees are more likely to continue with an employer in a tight job market.

Our valuation splits the other separations into two categories. These are (1) withdrawals: non-vested separations (i.e., those who do not have five years of service upon separation) and vested separations who defer their benefits until superannuation age, and (2) early retirements: vested separations who take immediate early retirement benefits.

Table IV-5 Other Separations from Active Employment				
	Actual Separations	Expected Separations	Ratio Actual-to-Expected	Ratio Actual-to-Recommended
	2015-2019	2015-2019	2015-2019	2015-2019
Female Separations	12,166	10,922	1.11	1.00
Male Separations	10,465	9,715	1.08	1.00
Total Separations	22,631	20,636	1.10	1.00

The following charts show the withdrawal experience by age. The valuation assumptions include select and ultimate rates that are higher expected rates of withdrawal in the early years of an employee’s career, reducing to an age-specific rate after seven to fifteen years, depending on age at hire. Both charts show withdrawal experience higher than expected at most ages. We recommend changes to all the rates to bring the expected separations closer to the actual observed separations.

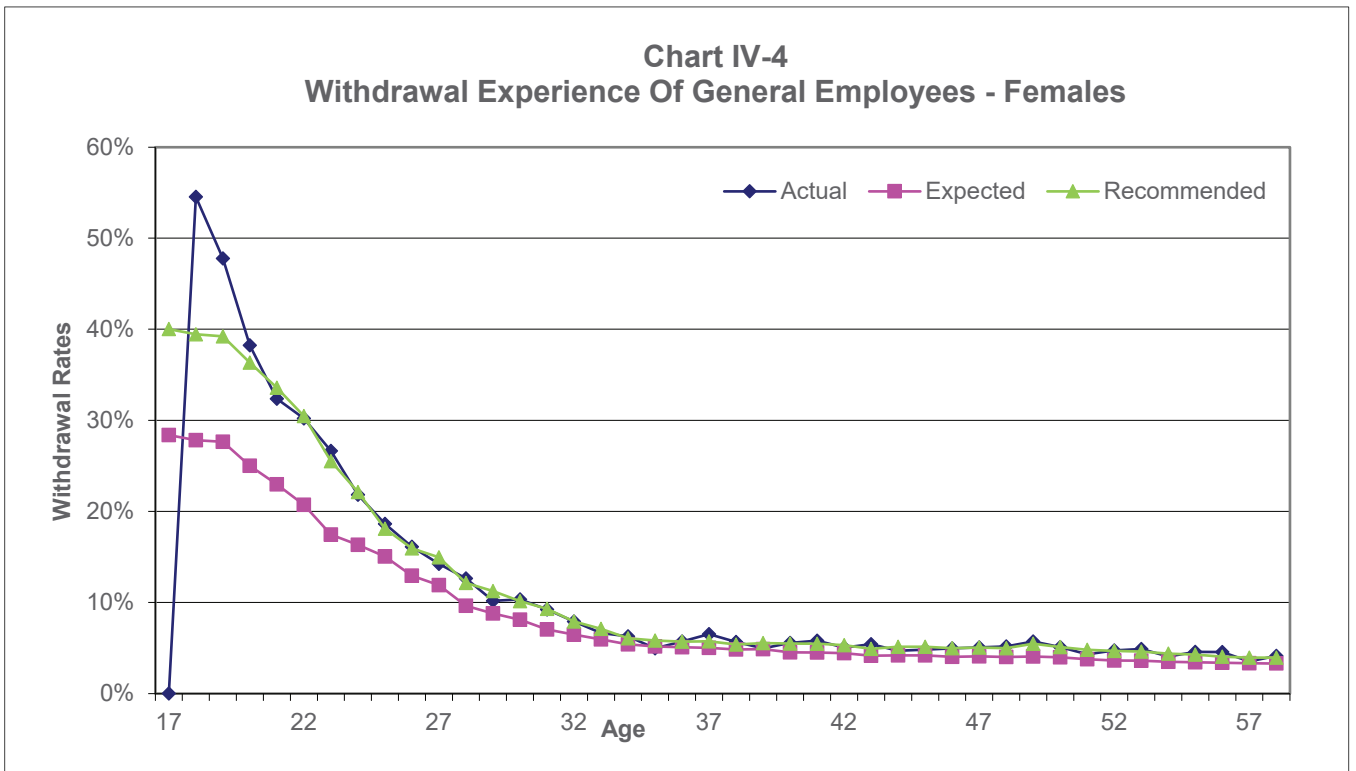


Table IV-6 summarizes the total actual terminations, expected terminations based on the current rates, the actual-to-expected ratio, and the actual-to-expected ratio based upon the recommended rates.



**Table IV-6
Total Employees Leaving Active Employment**

	Actual Terminations	Expected Terminations	Ratio Actual-to-Expected	Ratio Actual-to-Recommended
	2015-2019	2015-2019	2015-2019	2015-2019
Deaths	591	719	0.82	0.90
Disabilities	820	1,144	0.72	0.90
Superannuation Retirements	12,408	13,664	0.91	0.95
Other Separations	22,631	20,636	1.10	1.00
TOTAL	36,450	36,163	1.01	0.98

Analysis of Experience for Special Benefit Classes

Members who are in the General Assembly, members of the Judiciary, State Police and other members of law enforcement (categorized as Hazardous Duty employees) have different patterns of termination than do Class AA and Class A members eligible to retire at age 60, or with 35 years of service. Some of the differences, such as retirement at ages before 60, are attributable to different retirement eligibility conditions; and other differences, such as terminations without eligibility for a benefit before five years, are attributable to the characteristics of the group. Table IV-7 on the following page compares the actual terminations, expected terminations based on the current rates, the actual-to-expected ratio, and the actual-to-expected ratio based upon the recommended rates for each of the employee groups.

The rates of decrement for special classes tend to fluctuate more than for general employees because there are fewer employees in special classes and, therefore, more of a statistical variation from one study to the next. Of particular note, is the distinct pattern of retirements among State Police officers eligible for DiLauro Award benefits. The DiLauro Award creates significant incentives to delay retirement until reaching superannuation eligibility at either 20 or 25 years of service. This has had a significant impact on State Police superannuation rates in the past. In this study, the observed retirement behaviors among State Police during 2015 to 2019 have led us to recommend:

- Significantly higher (than current) retirement rates for those with 20 to 23 years of service,
- Little change to the current retirement rates for those with 24 or 25 years of service and
- Somewhat lower (than current) retirement rates for those with more than 25 years of service.

In general for all the special classes, we have reviewed the superannuation and other separation rates, and believe that it would be reasonable to set rates that project the same proportion of future retirements as the actual experience in the five-year study period. Therefore, we recommend the adoption of termination assumptions for superannuation and other terminations that approximately reproduce the actual experience of the study period.



**Table IV-7
Special Benefit Classes Leaving Active Employment**

	Actual Terminations	Expected Terminations	Ratio Actual-to-Expected	Ratio Actual-to-Recommended
	2015-2019	2015-2019	2015-2019	2015-2019
<u>Superannuation</u>				
State Police With More Than 20 Years of Service	1,247	1,067	1.17	0.99
Other Hazardous Duty	2,845	2,809	1.01	0.98
Legislators	49	49	1.00	0.96
Members of the Judiciary	189	300	0.63	0.96
<u>Early Retirement</u>				
Hazardous Duty and State Police	722	652	1.11	1.03
Legislators	5	5	1.07	1.00
Members of the Judiciary	17	24	0.71	0.96
<u>Withdrawal</u>				
Hazardous Duty and State Police	1,656	1,491	1.11	1.02
Legislators	17	22	0.78	0.93
Members of the Judiciary	20	11	1.86	0.97

Analysis of Annuitant Mortality – Benefit-Weighted, NOT Headcount-Weighted

As noted in the heading above, the actual and expected numbers of deaths among annuitants (categorized as either [i] non-disabled retirees and survivors or [ii] disabled retirees) ARE NOT shown on the following page in Tables IV-8, IV-9 and IV-10 in the form of headcounts of deaths, as they have been presented in the past. Rather, Korn Ferry has, effective with this 2015-2019 investigation of actuarial experience, modernized our annuitant mortality study methodology to weight deaths in all respects (i.e., for purposes of studying/measuring actual, expected or recommended deaths) by the benefit amount applicable to each individual annuitant included in the study.

It is widely recognized and has long been accepted among actuaries who develop mortality tables for use in pension valuations that pension participants with higher income amounts (salary for employees and benefit amount for nondisabled annuitants) tend to have lower rates of mortality than those with lower amounts. This is borne out in the results developed in the Society of Actuaries' "Pub-2010 Public Retirement Plans Mortality Tables Report", published in January of 2019, which included and compared the statistical results of both benefit-weighted and headcount-weighted mortality studies for the same populations. Korn Ferry as well, as a step in this 2015-2019 SERS experience study, performed both benefit-weighted and headcount-weighted annuitant mortality studies and concluded that (i) differences in results can be noteworthy and (ii) using the benefit-weighted methodology is preferred, especially as SERS adopts, on Korn Ferry's recommendation, new Pub-2010 mortality tables which were constructed using this same methodology.



Therefore, the appropriate terminology for describing the experience study results shown in Table IV-8 is as follows: Based upon SERS' current mortality assumptions, during the 5-year study period, \$18,202,037 in annual benefits was expected to cease as a result of expected deaths among male annuitants whereas \$16,398,736 in annual benefits actually did cease as a result of actual deaths among male annuitants, for an actual-to-expected ratio of 0.90. Table IV-9 shows that, during the 5-year study period, expected benefit-weighted deaths among female annuitants were \$10,099,811 compared to actual benefit-weighted deaths of \$9,916,825 for an actual-to-expected ratio of 0.98.

Table IV-8 Benefit-Weighted Deaths of Male Annuitants					
	Actual Deaths*	Expected Deaths*	Ratio Actual-to-Expected	Expected* with Recommended Rates	Ratio Actual-to-Recommended
	2015-2019	2015-2019	2015-2019	2015-2019	2015-2019
Non-disabled Retirees and Survivors	15,470,930	17,196,001	0.90	14,890,758	1.04
Disabled Retirees	927,806	1,006,036	0.92	903,168	1.03
TOTAL	16,398,736	18,202,037	0.90	15,793,926	1.04

Table IV-9 Benefit-Weighted Deaths of Female Annuitants					
	Actual Deaths*	Expected Deaths*	Ratio Actual-to-Expected	Expected* with Recommended Rates	Ratio Actual-to-Recommended
	2015-2019	2015-2019	2015-2019	2015-2019	2015-2019
Non-disabled Retirees and Survivors	9,150,940	9,399,924	0.97	8,940,009	1.02
Disabled Retirees	765,885	699,887	1.09	723,595	1.06
TOTAL	9,916,825	10,099,811	0.98	9,663,604	1.03

Table IV-10 Total Benefit-Weighted Deaths of All (Male + Female) Annuitants					
	Actual Deaths*	Expected Deaths*	Ratio Actual-to-Expected	Expected* with Recommended Rates	Ratio Actual-to-Recommended
	2015-2019	2015-2019	2015-2019	2015-2019	2015-2019
Non-disabled Retirees and Survivors	24,621,870	26,595,925	0.93	23,830,767	1.03
Disabled Retirees	1,693,691	1,705,923	0.99	1,626,763	1.04
TOTAL	26,315,561	28,301,848	0.93	25,457,530	1.03

*Benefit-Weighted Deaths, therefore amounts in this column are in dollars



The mortality assumption for annuitants is one of the most important factors in the valuation. Mortality has generally improved throughout the last 100 years, so we have set rates in the past that have anticipated this; we have consistently recommended mortality rates that have accounted for future mortality improvement.

As noted earlier, in January of 2019, the Society of Actuaries (SOA) published the results of its first-ever mortality experience study to focus solely on U.S. public pension plans, entitled “Pub-2010 Public Retirement Plans Mortality Tables Report”. Korn Ferry sees this actuarial experience study as an opportune time to significantly modernize the annuitant mortality assumptions for SERS, as follows:

- By adopting appropriate Pub-2010 base mortality tables for each of SERS’ four annuitant populations:
 - Male Non-disabled Retirees and Survivors
 - Female Non-disabled Retirees and Survivors
 - Male Disabled Retirees
 - Female Disabled Retirees

and

- By adopting the SOA’s most recent forecast of future mortality improvements, mortality improvement scale MP-2019, published in October of 2019, as the basis for projecting mortality improvement (increased longevity) for all years following 2010, the base year that applies for all of the Pub-2010 mortality tables. By applying MP-2019 to the mortality rates in each of the 4 recommended Pub-2010 mortality tables, an automatic (“built-in”) annual adjustment will occur on a generational basis (meaning the adjustment takes into account both the annuitant’s year of birth and the calendar year in which the adjustment is being applied). The effect over time on any individual annuitant is to automatically extend his/her life expectancy to reflect future expectations derived from the SOA’s mortality improvement research.

Korn Ferry’s Specific Annuitant Mortality Assumption Recommendations

Male Non-Disabled Annuitants & Survivors

- Our benefit-weighted actual-to-expected ratio for 2015-2019: 0.90, meaning our valuations have been over-predicting total deaths.
- Out of the three available Pub-2010 tables intended for use with healthy annuitants (one based on retired Teacher experience, one based on retired Public Safety experience and one based on retired General Public Employee experience) the General retiree table was considered most relevant. Since this group is male, we concluded that the PubG-2010 Male Retiree Mortality Table will match up best with this SERS annuitant population.
- Next, we compared the actual 2015-2019 mortality experience for this SERS group (treating all this experience as year 2017 experience, since that was the mid-year of our study) to the mortality results under the PubG-2010 Male Retiree Mortality Table adjusted for mortality improvement to 2017, which produced an actual-to-recommended ratio of 1.04. Adoption of this table, Korn Ferry felt, because it would be expected to slightly under-predict SERS deaths, would be a slightly conservative base table for this group. Thus, we recommend this mortality table as the basis for setting the 2010 mortality rates for Male Non-Disabled Annuitants & Survivors.
- To project mortality improvement for the years after 2010, we recommend use of Scale MP-2019 for Males.



Female Non-Disabled Annuitants & Survivors

- Our benefit-weighted actual-to-expected ratio for 2015-2019: 0.97, meaning our valuations have been over-predicting total deaths.
- Consistent with our conclusion (above) relating to the Male Non-Disabled Annuitants & Survivors, we determined the General retiree table was most relevant. Since this group is female, we concluded that the PubG-2010 Female Retiree Mortality Table will match up best with this SERS annuitant population
- Next, we compared the actual 2015-2019 mortality experience for this SERS group (treating all this experience as year 2017 experience, since that was the mid-year of our study) to the mortality results under the PubG-2010 Female Retiree Mortality Table adjusted for mortality improvement to 2017, which produced an actual-to-recommended ratio that was too high (well in excess of 1.0); however, setting forward the PubG-2010 Female Retiree Mortality Table by one year produced an actual-to-recommended ratio of 1.02. Adoption of this table, Korn Ferry felt, because it would be expected to slightly under-predict SERS deaths, would be a slightly conservative base table for this group. Thus, we recommend this mortality table, with a one year set forward, as the basis for setting the 2010 mortality rates for Female Non-Disabled Annuitants & Survivors
- To project mortality improvement for the years after 2010, we recommend use of Scale MP-2019 for Females.

Male Disabled Annuitants

- Our benefit-weighted actual-to-expected ratio for 2015-2019: 0.92, meaning our valuations have been over-predicting total deaths.
- Out of the two available Pub-2010 tables intended for use with disabled annuitants (one based on disabled Public Safety retiree experience and the other based on disabled non-Public Safety retiree experience) the non-Public Safety disabled retiree table was considered most relevant. Since this group is male, we concluded that the PubNS-2010 Male Disabled Retiree Mortality Table will match up best with this SERS annuitant population.
- Next, we compared the actual 2015-2019 mortality experience for this SERS group (treating all this experience as year 2017 experience, since that was the mid-year of our study) to the mortality results under the PubNS-2010 Male Disabled Retiree Mortality Table adjusted for mortality improvement to 2017, which produced an actual-to-recommended ratio that was too high (well in excess of 1.0); however, setting forward the PubNS-2010 Male Disabled Retiree Mortality Table by two years produced an actual-to-recommended ratio of 1.03. Adoption of this table, Korn Ferry felt, because it would be expected to slightly under-predict SERS deaths, would be a slightly conservative base table for this group. Thus, we recommend this mortality table, with a two-year set forward, as the basis for setting the 2010 mortality rates for Male Disabled Annuitants.
- To project mortality improvement for the years after 2010, we recommend use of Scale MP-2019 for Males.

Female Disabled Annuitants

- Our benefit-weighted actual-to-expected ratio for 2015-2019: 1.09, meaning our valuations have been under-predicting total deaths.
- Consistent with our conclusion (above) relating to the Male Disabled Annuitants, we determined the non-Public Safety disabled retiree table was most relevant. Since this group



is female, we concluded that the PubNS-2010 Female Disabled Retiree Mortality Table will match up best with this SERS annuitant population

- Next, we compared the actual 2015-2019 mortality experience for this SERS group (treating all this experience as year 2017 experience, since that was the mid-year of our study) to the mortality results under the PubNS-2010 Female Disabled Retiree Mortality Table adjusted for mortality improvement to 2017, which produced an actual-to-recommended ratio that was too high (well in excess of 1.0); however, setting forward the PubNS-2010 Female Disabled Retiree Mortality Table by two years produced an actual-to-recommended ratio of 1.06. Adoption of this table, Korn Ferry felt, because it would be expected to under-predict SERS deaths, would be a slightly conservative base table for this group. Thus, we recommend this mortality table, with a two-year set forward, as the basis for setting the 2010 mortality rates for Female Disabled Annuitants.
- To project mortality improvement for the years after 2010, we recommend use of Scale MP-2019 for Females.

Mortality Assumptions Underlying Actuarial Equivalence

Mortality tables are also used to establish the early retirement and other actuarial equivalence factors used to determine benefits payable to retirees who make optional elections. The two sets of mortality assumptions, those used for the valuation and those used for the actuarial equivalence factors, should be kept in step over the long run to avoid any significant cumulative gains or losses that could result from the exercise of optional elections at retirement.

However, we continue to feel, as we have communicated in our past actuarial investigation reports, that it is not necessary to change the actuarial equivalence factors every time there is a change in the valuation mortality assumptions. The change in equivalence factors is a very costly and time-consuming process. SERS staff has determined that the State Employees' Retirement Code does not require that the actuarial equivalence factors be changed every time the actuarial assumptions are changed. Therefore, we do not recommend that SERS' current actuarial equivalence factors be changed as a direct consequence of this actuarial experience study; however, this issue is one that Korn Ferry would like to explore further with SERS in the near future, rather than delay addressing it until the time of the next actuarial experience study.



V. Other Experience Analyses

Optional Retirement Elections

The valuation includes a prediction of the number of new retirees who will select each of the options. Prediction of the proportion that will elect Option 4 is particularly important because of the adverse effect on the fund of each such election. Table V-1 compares the current assumptions to the selection by new retirees during the experience period. Option 4, the return of the present value of all or part of the employee contributions, can be selected along with any other available option. The experience study shows a slight decrease in the prevalence of election of an Option 1 form of benefit and a slight increase in the prevalence of Option 2 and 3 elections.

Table V-1 Assumed Elections of Options at Retirement			
Election	Current Assumption	Experience	Recommended Assumption
I. Single Life Annuity	32%	33.3%	33%
II. Option 1	43%	41.0%	41%
III. Option 2 or 3 or other percentage survivor	25%	25.7%	26%
IV. Option 1 combined with III	Included in II and III	Included in II and III	Included in II and III
V. Total	100%	100%	100%
VI. Percent of available funds withdrawn under Option 4	80%	67.8%	70%

Korn Ferry's recommended assumptions are shown in the far right column above. These recommended assumptions are very similar to the current assumptions.

Purchases of Service

Employees can purchase certain past service by agreeing to pay the cost of that service. The most common purchases are for past SERS service and for military service. Before Act 9 in 2001, employees had to agree to pay the cost in a lump sum or in installment payments over no more than three years. Board policy permits payments over as long as six years. Act 9 permitted members to defer payment until retirement. The deferred payments, plus interest, are used to reduce the benefits at retirement.

This experience study included a review of purchases of service by eligible SERS members over the 2015-2019 period. Our study revealed a significant overall decline in purchases of service since this was last studied. We also determined that this lower level of activity of purchasing service is expected to continue. Therefore, Korn Ferry recommends the adoption of the purchased service assumptions included in the table below, which represent significantly lower levels of service expected to be purchased by eligible members of SERS in the future.



Table V-2 Number of Years Purchased		
Service	Current Assumption	Recommended Assumption
0	0.4	0.08
1	0.3	0.06
2	0.2	0.04
3	0.1	0.02
4+	0.0	0.00



VI. Cost Impact of Recommended Assumptions & Conclusion

On the following page, Korn Ferry (KF) provides estimates of the cost impact of our recommended new actuarial assumptions resulting from this 2015-2019 actuarial experience study. The four columns of liability/cost information, numbered (1) through (4) from left to right, can be described as follows:

- (1) Baseline Liabilities/Costs = Actual 12/31/19 Valuation Results
- (2) Hypothetical 12/31/19 Liabilities/Costs IF:
All of KF's Demographic and Career Salary Increase Assumptions Were Adopted
- (3) Hypothetical 12/31/19 Liabilities/Costs IF:
All of KF's Demographic and Career Salary Increase Assumptions Were Adopted & Annual Inflation Assumption Was Reduced From Current 2.60% to 2.50%
- (4) Hypothetical 12/31/19 Liabilities/Costs IF:
All of KF's Demographic and Career Salary Increase Assumptions Were Adopted & Annual Inflation Assumption Was Reduced From Current 2.60% to 2.50% & Investment Return Assumption Was Reduced From Current 7.125% to 7.00%

Based upon comparison of the results in Columns (1) and (4), KF estimated that adoption of all our assumption change recommendations would:

- Increase SERS' Unfunded Liability by approximately \$1.132B (an increase of about 4.9%)
- Increase SERS' Total Employer Cost by 1.11% of payroll (an increase of about 3.3%) and
- Decrease SERS' Funded Status from the current 56.5% to approximately 55.3%

On July 29, 2020, Korn Ferry and Callan co-presented to the SERS Board the assumption change recommendations included in this report, including the cost impact information shown on the following page. The SERS Board adopted all of the recommendations, to become effective with Korn Ferry's December 31, 2020 actuarial valuation.



Approximate Impact on SERS Liabilities/Costs Under Alternative Actuarial Valuation Assumptions

Actual 12/31/19 Valuation Results 12/31/19 Results Using Recommended Demographic Assumptions
AND:

	Actual 12/31/19 Valuation Results	7.125% 2.60%	Current 7.125% Current 2.60%	Current 7.125% Recommended 2.50%	Alternative 7.00% Recommended 2.50%
Economic Assumptions					
Investment Return:					
Annual Inflation:					
I. Present Value of Benefits:					
A) Active and Inactive Participants					
1) Superannuation and Withdrawal	\$ 27,386,294,187	\$ 26,502,431,465	\$ 26,279,242,895	\$ 26,868,507,792	\$ 26,868,507,792
2) Disability	943,382,930	737,567,236	732,469,356	749,283,527	749,283,527
3) Death	887,933,670	752,969,359	746,717,535	755,632,190	755,632,190
4) Refunds	74,161,038	81,211,415	81,167,928	81,240,860	81,240,860
5) Special Police and Enforcement Officer Benefits	-	-	-	-	-
6) Subtotal	\$ 29,291,771,825	\$ 28,074,179,475	\$ 27,839,597,714	\$ 28,454,664,369	\$ 28,454,664,369
B) Annuitants and Beneficiaries	29,651,542,459	30,793,056,194	30,793,056,194	31,099,640,793	31,099,640,793
C) Total	\$ 58,943,314,284	\$ 58,867,235,669	\$ 58,632,653,908	\$ 59,554,305,162	\$ 59,554,305,162
II. Present Value of Member and Employer Contributions:					
A) Employer Portion of Normal Cost	\$ 1,140,175,343	\$ 834,396,073	\$ 783,658,123	\$ 898,051,139	\$ 898,051,139
B) Member Contributions	4,055,157,687	3,753,066,086	3,722,406,338	3,757,339,675	3,757,339,675
C) Administrative Expenses	(250,942,612)	(232,336,563)	(230,428,327)	(232,451,292)	(232,451,292)
D) Fiscal Year Amortization Payable	1,026,348,597	1,026,348,597	1,026,348,597	1,026,648,217	1,026,648,217
E) Total	\$ 5,970,739,015	\$ 5,381,474,193	\$ 5,301,984,731	\$ 5,449,587,739	\$ 5,449,587,739
III. Actuarial Accrued Liability: (I) - (II)	\$ 52,972,575,269	\$ 53,485,761,476	\$ 53,330,669,177	\$ 54,104,717,423	\$ 54,104,717,423
IV. Actuarial Value of Assets	\$ 29,934,023,548	\$ 29,934,023,548	\$ 29,934,023,548	\$ 29,934,023,548	\$ 29,934,023,548
V. Unfunded Liability: (III) - (IV)	\$ 23,038,551,721	\$ 23,551,737,928	\$ 23,396,645,629	\$ 24,170,693,875	\$ 24,170,693,875
VI. Amortization of Unfunded Liability as Percentage of Pay	31.12%	32.05%	31.88%	32.48%	32.48%
VII. Employer Normal Cost as Percentage of Pay	1.67%	1.32%	1.25%	1.42%	1.42%
VIII. Extra Contribution to Return Act 5 Savings	0.66%	0.66%	0.66%	0.66%	0.66%
IX. Total Employer Cost: (VI) + (VII) + (VIII)	33.45%	34.03%	33.79%	34.56%	34.56%
X. Employer Cost Increase Vs Actual 12/31/19 Valuation	0.00%	0.58%	0.34%	1.11%	1.11%
XI. Funded Status (Actuarial Assets): (IV)/(III)	56.5%	56.0%	56.1%	55.3%	55.3%



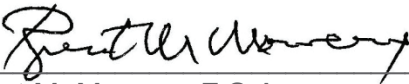
VII. Actuarial Certification

This report presents an investigation of the actuarial experience of the State Employees' Retirement System of the Commonwealth of Pennsylvania, covering the period from January 1, 2015 to December 31, 2019.

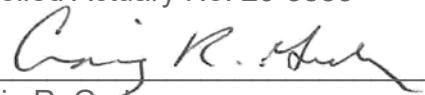
To the best of our knowledge, this report is complete and accurate, and all recommended assumptions shown in this report are reasonable actuarial assumptions which represent our best estimate of anticipated experience under the plan, determined in conformance with generally accepted actuarial principles.

The actuaries certifying to this investigation are members of the Society of Actuaries or other professional actuarial organizations, and meet the General Qualification Standards of the American Academy of Actuaries for purposes of issuing Statements of Actuarial Opinion.

Respectfully submitted,
Korn Ferry
July 29, 2020

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VIII. Glossary

Actual-to-Expected Ratio – The actual number of members leaving for a specific cause (such as retirement) divided by the number the actuary expected to leave.

Actuarial Assumptions – Predicted probability of future events including economic and demographic assumptions.

ASOP – Actuarial Standard of Practice; ASOPs are promulgated by the Actuarial Standards Board.

Demographic Assumptions – Predictions about the rate at which employees will leave the retirement plan and the rate at which annuitants will die. These include rates of retirement and disability.

Economic Assumptions – Predictions about the future earnings of the retirement fund, salary growth and inflation.

Investment Rate – The expected return on plan assets. This rate is expressed as an annual rate and is a compound rate, meaning that a sum of \$10,000 invested for 10 years at 7.50 percent will yield \$20,610.

Salary Growth Rate – The expected increase in salary from the current year to the next year. Salary increase rates vary with service, with larger percentage increases expected in the beginning of an employee's career and smaller increases expected in the later years.



Appendix – Recommended Assumptions

The recommended assumptions are shown in detail in the following tables.

Recommended Economic Assumptions					
	Annual Inflation	Investment Return		Salary Growth	
		Nominal	Real	Nominal	Real
Recommended	2.50%	7.00%	4.4%	2.8%	0.3%
Current - 2019	2.60%	7.125%	4.4%	2.9%	0.3%
Prior 2016 – 2018	2.60%	7.25%	4.5%	2.9%	0.3%
Prior 2011 – 2015	2.75%	7.50%	4.6%	3.05%	0.3%
Prior 2010	2.75%	8.00%	5.1%	3.05%	0.3%
Prior 2008 & 2009	3.00%	8.00%	4.9%	3.30%	0.3%

- Table A – 1 Career Salary Increase Rates
- Table A – 2 Mortality Rates for All Active Employees
- Table A – 3 Disability Retirement Rates for All Active Employees
- Table A – 4 Superannuation Retirement Rates for General Employees
- Table A – 5 Early Retirement Rates for General Employees with 15 or More Years of Service
- Table A – 6 Early Retirement Rates for General Employees with 5 – 14 Years of Service
- Table A – 7 Recommended Withdrawal Rates for General Employees (Current Rates Not Shown)
- Table A – 8 Mortality Rates for Non-Disabled Annuitants and Survivors
- Table A – 9 Mortality Rates for Disabled Annuitants
- Table A – 10 Superannuation Retirement Rates for State Police
- Table A – 11 Superannuation Retirement Rates for Hazardous Duty Employees
- Table A – 12 Early Retirement Rates for State Police and Hazardous Duty Employees
- Table A – 13 Withdrawal Rates for State Police and Hazardous Duty Employees
- Table A – 14 Superannuation Retirement Rates for Legislators
- Table A – 15 Early Retirement Rates for Legislators
- Table A – 16 Withdrawal Rates for Legislators
- Table A – 17 Superannuation Rates for Judicial Officers
- Table A – 18 Early Retirement Rates for Judicial Officers
- Table A – 19 Withdrawal Rates for Judicial Officers
- Table A – 20 Early Retirement Rates for Class A-3 and A-4 General Employees
- Table A – 21 Superannuation Retirement Rates for Class A-3 and A-4 General Employees
- Table A – 22 Early Retirement Rates for Class A-5 and A-6 General Employees
- Table A – 23 Superannuation Retirement Rates for Class A-5 and A-6 General Employees



Career Salary Increase Rates

Table A-1 shows the actual salary growth experience (A), current total salary increase assumptions from general and career increases combined (B), recommended total salary increase assumptions (C), the current career salary increase assumptions (D) and the recommended career salary increase assumptions (E).

Table A-1 Development of Recommended Career Salary Increase Assumptions					
Years of Credited Service	Actual Salary Increase	Current Assumed Total Salary Increase	Recommended Total Salary Increase	Current Career Salary Increase	Recommended Career Salary Increase
	(A)	(B)	(C)	(D)	(E)
1	3.21%	8.90%	6.95%	6.00%	4.15%
2	2.74%	7.40%	6.05%	4.50%	3.25%
3	2.61%	6.90%	5.70%	4.00%	2.90%
4	2.46%	6.65%	5.50%	3.75%	2.70%
5	1.97%	6.40%	5.30%	3.50%	2.50%
6	1.51%	6.15%	5.15%	3.25%	2.35%
7	1.63%	5.90%	4.95%	3.00%	2.15%
8	1.75%	5.80%	4.90%	2.90%	2.10%
9	1.44%	5.70%	4.80%	2.80%	2.00%
10	1.09%	5.60%	4.40%	2.70%	1.60%
11	1.20%	5.50%	4.35%	2.60%	1.55%
12	0.94%	5.40%	4.25%	2.50%	1.45%
13	1.05%	5.30%	4.20%	2.40%	1.40%
14	0.75%	5.20%	4.15%	2.30%	1.35%
15	0.82%	5.10%	4.10%	2.20%	1.30%
16	0.72%	5.00%	4.05%	2.10%	1.25%
17	0.79%	4.95%	4.00%	2.05%	1.20%
18	0.79%	4.90%	3.95%	2.00%	1.15%
19	0.54%	4.85%	3.95%	1.95%	1.15%
20	0.57%	4.80%	3.90%	1.90%	1.10%
21	0.76%	4.75%	3.80%	1.85%	1.00%
22	0.83%	4.65%	3.75%	1.75%	0.95%
23	0.58%	4.55%	3.70%	1.65%	0.90%
24	0.64%	4.45%	3.65%	1.55%	0.85%
25	0.31%	4.35%	3.60%	1.45%	0.80%
26	0.37%	4.15%	3.50%	1.25%	0.70%
27	0.11%	3.95%	3.40%	1.05%	0.60%
28	0.15%	3.80%	3.30%	0.90%	0.50%
29	0.16%	3.75%	3.30%	0.85%	0.50%
30	0.00%	3.70%	3.30%	0.80%	0.50%
31	0.20%	3.70%	3.30%	0.80%	0.50%
32	0.27%	3.70%	3.30%	0.80%	0.50%
33	0.00%	3.70%	3.30%	0.80%	0.50%
34	0.00%	3.70%	3.30%	0.80%	0.50%
35	0.39%	3.70%	3.30%	0.80%	0.50%
36	0.00%	3.70%	3.30%	0.80%	0.50%
37	0.00%	3.70%	3.30%	0.80%	0.50%
38	0.28%	3.70%	3.30%	0.80%	0.50%
39	0.00%	3.70%	3.30%	0.80%	0.50%
40	0.00%	3.70%	3.30%	0.80%	0.50%



**Table A-2
Mortality Rates for All Active Employees**

Age	Males		Females	
	Current	Recommended	Current	Recommended
17	0.0004	0.0006	0.0001	0.0001
18	0.0004	0.0006	0.0001	0.0001
19	0.0004	0.0006	0.0002	0.0003
20	0.0004	0.0006	0.0002	0.0003
21	0.0004	0.0006	0.0002	0.0003
22	0.0004	0.0006	0.0002	0.0003
23	0.0004	0.0006	0.0002	0.0003
24	0.0004	0.0006	0.0002	0.0003
25	0.0004	0.0006	0.0002	0.0003
26	0.0004	0.0006	0.0002	0.0003
27	0.0004	0.0006	0.0002	0.0003
28	0.0004	0.0006	0.0002	0.0003
29	0.0004	0.0006	0.0002	0.0003
30	0.0005	0.0007	0.0002	0.0003
31	0.0005	0.0007	0.0002	0.0003
32	0.0005	0.0007	0.0002	0.0003
33	0.0005	0.0007	0.0003	0.0004
34	0.0005	0.0007	0.0003	0.0004
35	0.0006	0.0008	0.0003	0.0004
36	0.0007	0.0008	0.0003	0.0004
37	0.0007	0.0009	0.0004	0.0005
38	0.0008	0.0010	0.0004	0.0005
39	0.0008	0.0011	0.0004	0.0005
40	0.0009	0.0011	0.0004	0.0005
41	0.0009	0.0012	0.0004	0.0005
42	0.0010	0.0013	0.0005	0.0006
43	0.0010	0.0013	0.0005	0.0007
44	0.0011	0.0014	0.0006	0.0008
45	0.0013	0.0014	0.0006	0.0008
46	0.0015	0.0015	0.0007	0.0009
47	0.0017	0.0015	0.0007	0.0010
48	0.0019	0.0017	0.0008	0.0010
49	0.0022	0.0018	0.0008	0.0011
50	0.0024	0.0020	0.0009	0.0011
51	0.0025	0.0021	0.0009	0.0011
52	0.0026	0.0022	0.0010	0.0011
53	0.0027	0.0023	0.0010	0.0011
54	0.0028	0.0024	0.0012	0.0011
55	0.0029	0.0025	0.0014	0.0012
56	0.0030	0.0026	0.0016	0.0013
57	0.0031	0.0027	0.0018	0.0014
58	0.0032	0.0028	0.0020	0.0016
59	0.0033	0.0028	0.0022	0.0017
60	0.0035	0.0029	0.0024	0.0019
61	0.0037	0.0031	0.0026	0.0020
62	0.0039	0.0033	0.0028	0.0022
63	0.0041	0.0035	0.0030	0.0023
64	0.0043	0.0037	0.0035	0.0027



Table A-2				
Mortality Rates for All Active Employees				
Age	Males		Females	
	Current	Recommended	Current	Recommended
65	0.0048	0.0041	0.0040	0.0031
66	0.0054	0.0046	0.0045	0.0035
67	0.0059	0.0050	0.0050	0.0039
68	0.0067	0.0057	0.0060	0.0047
69	0.0075	0.0064	0.0070	0.0055
70	0.0086	0.0073	0.0080	0.0062
71	0.0097	0.0082	0.0090	0.0070
72	0.0108	0.0092	0.0100	0.0078
73	0.0129	0.0110	0.0110	0.0086
74	0.0156	0.0133	0.0120	0.0094
75	0.0183	0.0156	0.0130	0.0101
76	0.0215	0.0183	0.0140	0.0109
77	0.0258	0.0220	0.0150	0.0117
78	0.0280	0.0238	0.0160	0.0125
79	0.0301	0.0256	0.0170	0.0133
80	0.0323	0.0275	0.0180	0.0140
81	0.0323	0.0275	0.0190	0.0148
82+	0.0323	0.0275	0.0200	0.0156

Table A-3				
Disability Retirement Rates for All Active Employees				
Age	Males		Females	
	Current	Recommended	Current	Recommended
23	0.00021	0.00011	0.00035	0.00020
24	0.00021	0.00011	0.00035	0.00020
25	0.00021	0.00011	0.00035	0.00020
26	0.00034	0.00018	0.00040	0.00022
27	0.00034	0.00018	0.00050	0.00028
28	0.00050	0.00026	0.00050	0.00028
29	0.00062	0.00032	0.00070	0.00039
30	0.00062	0.00032	0.00085	0.00047
31	0.00069	0.00035	0.00100	0.00056
32	0.00076	0.00039	0.00109	0.00061
33	0.00083	0.00042	0.00129	0.00072
34	0.00103	0.00053	0.00139	0.00078
35	0.00110	0.00056	0.00144	0.00081
36	0.00117	0.00060	0.00149	0.00084
37	0.00117	0.00060	0.00154	0.00086
38	0.00124	0.00063	0.00169	0.00109
39	0.00131	0.00067	0.00179	0.00132
40	0.00172	0.00088	0.00189	0.00155
41	0.00193	0.00098	0.00209	0.00178
42	0.00220	0.00125	0.00229	0.00201
43	0.00241	0.00151	0.00254	0.00223
44	0.00268	0.00177	0.00264	0.00232
45	0.00303	0.00204	0.00298	0.00263



Table A-3				
Disability Retirement Rates for All Active Employees				
Age	Males		Females	
	Current	Recommended	Current	Recommended
46	0.00323	0.00230	0.00333	0.00293
47	0.00351	0.00256	0.00358	0.00315
48	0.00358	0.00283	0.00398	0.00350
49	0.00399	0.00315	0.00428	0.00376
50	0.00420	0.00332	0.00453	0.00398
51	0.00447	0.00353	0.00472	0.00416
52	0.00468	0.00370	0.00497	0.00438
53	0.00509	0.00402	0.00527	0.00464
54	0.00530	0.00419	0.00547	0.00481
55	0.00551	0.00435	0.00572	0.00503
56	0.00564	0.00446	0.00597	0.00525
57	0.00592	0.00468	0.00622	0.00547
58	0.00606	0.00478	0.00646	0.00569
59	0.00633	0.00500	0.00671	0.00591
60	0.00000	0.00000	0.00000	0.00000

Table A-4				
Comparison of Current and Recommended Superannuation Retirement Rates for General Employees				
Age	Males		Females	
	Current Superannuation Retirement Rates	Recommended Superannuation Retirement Rates	Current Superannuation Retirement Rates	Recommended Superannuation Retirement Rates
51	0.15	0.15	0.15	0.15
52	0.15	0.15	0.15	0.15
53	0.20	0.15	0.23	0.23
54	0.23	0.15	0.23	0.23
55	0.23	0.20	0.23	0.23
56	0.24	0.20	0.23	0.23
57	0.24	0.20	0.23	0.23
58	0.27	0.25	0.23	0.23
59	0.30	0.25	0.25	0.28
60	0.25	0.20	0.25	0.23
61	0.20	0.20	0.20	0.20
62	0.25	0.20	0.25	0.20
63	0.20	0.20	0.20	0.20
64	0.20	0.20	0.20	0.20
65	0.25	0.26	0.25	0.26
66	0.25	0.26	0.25	0.26
67	0.23	0.26	0.23	0.26
68	0.23	0.23	0.23	0.23
69	0.23	0.23	0.23	0.23
70	0.23	0.23	0.23	0.23
71 to 79	0.20	0.20	0.20	0.20
80	1.00	1.00	1.00	1.00



Table A-5
Early Retirement Rates for Active General Employees
with 15 or more Years of Service

Age	Males		Females	
	Current	Recommended	Current	Recommended
31	0.01000	0.00800	0.01200	0.01400
32	0.01000	0.00800	0.01200	0.01400
33	0.01000	0.00800	0.01200	0.01400
34	0.01000	0.00800	0.01200	0.01400
35	0.01000	0.00800	0.01200	0.01400
36	0.01000	0.00800	0.01200	0.01400
37	0.01000	0.00800	0.01200	0.01400
38	0.01000	0.00800	0.01200	0.01400
39	0.01000	0.00800	0.01200	0.01400
40	0.01000	0.00600	0.01200	0.01300
41	0.01000	0.00600	0.01200	0.01300
42	0.01000	0.00600	0.01200	0.01300
43	0.01000	0.00600	0.01600	0.01300
44	0.01000	0.00600	0.01600	0.01300
45	0.01000	0.00600	0.01600	0.01300
46	0.01000	0.00600	0.01600	0.01300
47	0.02000	0.01100	0.01600	0.01300
48	0.02000	0.01100	0.01600	0.01300
49	0.02000	0.01100	0.01600	0.01300
50	0.02000	0.01100	0.02000	0.01600
51	0.02000	0.01100	0.03000	0.02400
52	0.03000	0.02400	0.05000	0.04500
53	0.04000	0.03200	0.06000	0.04500
54	0.05000	0.04000	0.06000	0.04500
55	0.06000	0.05000	0.06000	0.04500
56	0.07000	0.05500	0.07000	0.05500
57	0.08000	0.06300	0.08000	0.06300
58	0.10000	0.08000	0.10000	0.08000
59	0.20000	0.16000	0.20000	0.16000
60	0.00000	0.00000	0.00000	0.00000



Table A-6
Early Retirement Rates for Active General Employees
with 5 - 14 Years of Service

Age	Males		Females	
	Current	Recommended	Current	Recommended
21	0.02000	0.02200	0.03700	0.04000
22	0.02000	0.02200	0.03700	0.04000
23	0.02000	0.02200	0.03700	0.04000
24	0.02000	0.02200	0.03700	0.04000
25	0.02000	0.02200	0.03700	0.04000
26	0.02000	0.02200	0.03700	0.04000
27	0.02000	0.02200	0.03700	0.04000
28	0.02000	0.02200	0.03700	0.04000
29	0.03000	0.02200	0.03700	0.04000
30	0.01600	0.02200	0.01900	0.02000
31	0.01600	0.02200	0.01900	0.02000
32	0.01600	0.02200	0.01900	0.02000
33	0.01600	0.02200	0.01900	0.02000
34	0.01600	0.02200	0.01900	0.02000
35	0.01600	0.01300	0.01900	0.02000
36	0.01600	0.01300	0.01900	0.02000
37	0.01600	0.01300	0.01900	0.02000
38	0.01600	0.01300	0.01900	0.02000
39	0.01600	0.01300	0.01900	0.02000
40	0.01600	0.01000	0.01900	0.01400
41	0.01600	0.01000	0.01900	0.01400
42	0.01600	0.01000	0.01900	0.01400
43	0.01600	0.01000	0.01900	0.01400
44	0.01600	0.01000	0.01900	0.01400
45	0.01350	0.01000	0.01900	0.01400
46	0.01350	0.01000	0.01900	0.01400
47	0.01350	0.01000	0.01900	0.01400
48	0.01350	0.01000	0.01900	0.01400
49	0.01350	0.01000	0.01900	0.01400
50	0.01350	0.01000	0.01900	0.01400
51	0.01350	0.01000	0.01900	0.01400
52	0.01350	0.01000	0.01900	0.01400
53	0.01350	0.01000	0.01900	0.01400
54	0.01350	0.01000	0.01900	0.01400
55	0.01350	0.02000	0.01900	0.02300
56	0.01350	0.02000	0.01900	0.02300
57	0.01350	0.02000	0.01900	0.02300
58	0.01350	0.02000	0.01900	0.02300
59	0.01350	0.02000	0.01900	0.02300
60	0.00000	0.00000	0.00000	0.00000



**Table A-7
Recommended Withdrawal Rates for Males**

Age	Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
17	0.30000	0.18400													
18	0.30000	0.18400	0.17000												
19	0.30000	0.18400	0.17000	0.12590											
20	0.30000	0.18400	0.17000	0.12590	0.07450										
21	0.30000	0.18400	0.15040	0.12590	0.07450	0.06140									
22	0.30000	0.18400	0.15040	0.12590	0.07450	0.06140	0.04600								
23	0.28730	0.18400	0.14910	0.11790	0.07450	0.06140	0.04600	0.03180							
24	0.24630	0.18400	0.14910	0.11790	0.07450	0.06140	0.04600	0.03180	0.02630						
25	0.20950	0.15820	0.14910	0.11790	0.07450	0.06140	0.04600	0.03180	0.02630	0.02950					
26	0.20220	0.15710	0.14910	0.11790	0.07450	0.06140	0.04600	0.03180	0.02630	0.02950	0.02430				
27	0.19480	0.15710	0.11330	0.11790	0.07450	0.06140	0.04600	0.03180	0.02630	0.02950	0.02430	0.02030			
28	0.19480	0.11920	0.11330	0.11790	0.07450	0.06140	0.03750	0.02730	0.02520	0.02950	0.02430	0.02030	0.04620		
29	0.19480	0.11920	0.11330	0.09060	0.07450	0.06140	0.03750	0.02730	0.02520	0.02950	0.02430	0.02030	0.04620	0.01460	
30	0.18540	0.13410	0.07240	0.09060	0.07450	0.06140	0.03750	0.03050	0.02520	0.02950	0.02430	0.02030	0.04620	0.01460	0.01850
31	0.18540	0.13410	0.13610	0.09060	0.07450	0.06140	0.03750	0.03050	0.02520	0.02950	0.02430	0.02030	0.04620	0.01460	0.01850
32	0.18540	0.13410	0.13610	0.09060	0.07450	0.06140	0.03750	0.03050	0.02520	0.02950	0.02430	0.02030	0.04620	0.01460	0.01850
33	0.18540	0.09250	0.13610	0.06720	0.06680	0.04870	0.03390	0.03980	0.02480	0.01820	0.02230	0.01420	0.01920	0.01460	0.01850
34	0.18540	0.09250	0.13610	0.06720	0.06680	0.04870	0.03390	0.03980	0.02480	0.01550	0.02230	0.01420	0.01920	0.01460	0.01850
35	0.18540	0.10540	0.10580	0.05910	0.06680	0.04870	0.03390	0.03980	0.02480	0.01550	0.02230	0.01420	0.01920	0.01460	0.01850
36	0.14720	0.10440	0.10480	0.05910	0.06680	0.04870	0.02430	0.03980	0.02480	0.01550	0.02230	0.01420	0.01920	0.01460	0.01850
37	0.14720	0.10340	0.08030	0.05910	0.06680	0.04870	0.02430	0.03980	0.02480	0.01550	0.02230	0.01420	0.01920	0.01460	0.01850
38	0.14720	0.10240	0.07940	0.05910	0.06680	0.04870	0.02430	0.02250	0.02480	0.01550	0.02230	0.00900	0.01920	0.01460	0.01850
39	0.18280	0.10150	0.07860	0.05910	0.05240	0.04870	0.02430	0.02250	0.02480	0.01550	0.02230	0.00900	0.01920	0.01460	0.01850



**Table A-7
Recommended Withdrawal Rates for Males**

Age	Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
40	0.18200	0.10050	0.07790	0.05280	0.04730	0.03400	0.02530	0.01530	0.02700	0.02840	0.02060	0.00900	0.01920	0.01460	0.01850
41	0.17980	0.09950	0.07790	0.06060	0.04730	0.03400	0.02530	0.02390	0.01920	0.02840	0.02060	0.00900	0.01920	0.01460	0.01850
42	0.17840	0.09850	0.07040	0.06060	0.04730	0.03400	0.02530	0.02390	0.01920	0.02840	0.02060	0.00900	0.01920	0.01460	0.00920
43	0.17690	0.09750	0.07040	0.05940	0.04730	0.03400	0.02530	0.02390	0.01920	0.02840	0.02060	0.00900	0.01920	0.01460	0.00920
44	0.17410	0.09650	0.07040	0.05940	0.04730	0.03400	0.02530	0.02390	0.01920	0.02840	0.02060	0.00900	0.01920	0.01460	0.00920
45	0.17410	0.10980	0.08240	0.05940	0.04730	0.03400	0.04540	0.03310	0.02230	0.01600	0.02670	0.01850	0.01670	0.00410	0.00580
46	0.17410	0.10870	0.08240	0.05940	0.04730	0.03400	0.04540	0.03310	0.02230	0.01600	0.01880	0.01850	0.01330	0.01300	0.00580
47	0.17410	0.10750	0.08240	0.06910	0.04730	0.03400	0.01730	0.02070	0.02230	0.01600	0.01880	0.01850	0.01330	0.01300	0.00580
48	0.17410	0.10640	0.08240	0.06910	0.03180	0.03400	0.01730	0.02070	0.02230	0.01600	0.01880	0.01850	0.01330	0.01300	0.00580
49	0.19140	0.10530	0.08240	0.06910	0.03180	0.02860	0.01730	0.02070	0.02230	0.01600	0.01880	0.01850	0.00630	0.01190	0.00580
50	0.19140	0.10530	0.08170	0.06910	0.02280	0.03120	0.02500	0.02180	0.00910	0.01600	0.01170	0.02390	0.00630	0.01190	0.00580
51	0.19140	0.10530	0.08170	0.06910	0.04380	0.03120	0.02500	0.02180	0.01870	0.01600	0.01170	0.01160	0.00630	0.01190	0.00580
52	0.19140	0.10530	0.08170	0.06910	0.04380	0.03120	0.02500	0.02180	0.01870	0.01600	0.01170	0.01160	0.00630	0.01190	0.00580
53	0.19140	0.10530	0.08170	0.06910	0.04380	0.03120	0.04860	0.02180	0.01870	0.01600	0.01170	0.01160	0.00630	0.01190	0.00580
54	0.19140	0.10320	0.05930	0.06910	0.04380	0.03640	0.04860	0.02180	0.01870	0.01600	0.01170	0.00730	0.00630	0.01190	0.00580
55	0.19140	0.10320	0.05930	0.06910	0.04380	0.02640	0.01850	0.01410	0.01800	0.00800	0.01420	0.00900	0.00800	0.00890	0.00380
56	0.19140	0.10320	0.05930	0.06910	0.04380	0.02640	0.01850	0.01410	0.01800	0.00800	0.01420	0.00900	0.00800	0.00890	0.00380
57	0.19140	0.10320	0.05930	0.06910	0.04380	0.02640	0.01850	0.01410	0.01800	0.00800	0.01420	0.00900	0.00800	0.00890	0.00380
58	0.19140	0.10320	0.05930	0.06910	0.04380	0.02640	0.01850	0.01410	0.01800	0.00800	0.01420	0.00900	0.00800	0.00890	0.00380
59	0.19140	0.10320	0.05930	0.06910	0.04380	0.02640	0.01850	0.01410	0.01800	0.00800	0.01420	0.00900	0.00800	0.00890	0.00380



**Table A-7
Recommended Withdrawal Rates for Females**

Age	Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
17	0.40020	0.27210													
18	0.40020	0.27210	0.14930												
19	0.40020	0.27210	0.14930	0.13160											
20	0.40020	0.27210	0.14930	0.13160	0.13140										
21	0.40020	0.27210	0.14930	0.13160	0.13140	0.08540									
22	0.40020	0.27210	0.14930	0.13160	0.13140	0.08540	0.06230								
23	0.31540	0.25500	0.14930	0.13160	0.13140	0.08540	0.06230	0.04600							
24	0.31540	0.17590	0.14540	0.13160	0.13140	0.08540	0.06230	0.04600	0.03410						
25	0.24830	0.17590	0.14540	0.13160	0.13140	0.08540	0.06230	0.04600	0.03410	0.02420					
26	0.21310	0.17590	0.14540	0.13160	0.13140	0.08540	0.06230	0.04600	0.03410	0.02420	0.02930				
27	0.21310	0.17590	0.14540	0.13160	0.13140	0.08540	0.06230	0.03960	0.03410	0.02420	0.02930	0.02790			
28	0.21310	0.14360	0.12550	0.11840	0.07490	0.07680	0.05670	0.03960	0.03410	0.02340	0.02930	0.02790	0.02400		
29	0.21310	0.14360	0.12550	0.11840	0.07490	0.07680	0.05670	0.03960	0.03410	0.02340	0.02930	0.02790	0.02400	0.02140	
30	0.21310	0.14360	0.12550	0.09290	0.07490	0.07680	0.05670	0.03960	0.03410	0.02340	0.02930	0.02790	0.02400	0.02140	0.02910
31	0.19660	0.14360	0.12550	0.09290	0.07490	0.07680	0.05670	0.03960	0.03410	0.02340	0.02930	0.02790	0.02400	0.02140	0.02910
32	0.19660	0.09740	0.12550	0.09290	0.05640	0.07680	0.05670	0.03960	0.03410	0.02340	0.02930	0.02790	0.02400	0.02140	0.02910
33	0.19660	0.09740	0.12550	0.08290	0.05520	0.04700	0.04710	0.03960	0.02390	0.02390	0.02090	0.02790	0.01970	0.01660	0.02100
34	0.16710	0.09740	0.08770	0.07860	0.05190	0.04530	0.04710	0.03010	0.03530	0.02390	0.01690	0.02150	0.01860	0.01660	0.02100
35	0.16600	0.09740	0.08770	0.07860	0.05060	0.04530	0.04710	0.03010	0.03530	0.02390	0.01690	0.02150	0.01860	0.01660	0.02100
36	0.16490	0.09740	0.08770	0.07860	0.04940	0.04530	0.04710	0.03010	0.03530	0.02390	0.01690	0.02150	0.01860	0.01660	0.02100
37	0.16380	0.09740	0.08770	0.07860	0.06400	0.04530	0.04710	0.03010	0.03530	0.02390	0.01690	0.02150	0.01860	0.01660	0.02100
38	0.16270	0.09740	0.08770	0.07860	0.06240	0.04530	0.04280	0.02190	0.02640	0.01200	0.01570	0.01670	0.01450	0.01290	0.01450
39	0.16170	0.09740	0.08770	0.07860	0.06240	0.04530	0.04280	0.02190	0.02640	0.02340	0.01570	0.01670	0.01450	0.01290	0.01450



Table A-7
Recommended Withdrawal Rates for Females

Age	Service														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
40	0.14770	0.11040	0.08770	0.07860	0.06240	0.04530	0.03740	0.02190	0.02640	0.02340	0.01160	0.01650	0.01140	0.01440	0.01620
41	0.14660	0.11040	0.08770	0.07860	0.05690	0.05140	0.03740	0.02040	0.02640	0.02340	0.01160	0.01650	0.01870	0.00810	0.01620
42	0.14550	0.11040	0.09160	0.07860	0.05690	0.05140	0.02910	0.02040	0.01440	0.02340	0.02180	0.00940	0.01870	0.00810	0.01620
43	0.14440	0.09360	0.08400	0.07360	0.05690	0.04280	0.02910	0.02040	0.01440	0.01080	0.02180	0.00940	0.01870	0.00810	0.01620
44	0.17780	0.09360	0.08400	0.05280	0.05120	0.04280	0.02910	0.02040	0.01440	0.01080	0.02180	0.00940	0.01870	0.00810	0.01620
45	0.17780	0.09360	0.08400	0.05280	0.05120	0.04280	0.02910	0.02040	0.01440	0.01080	0.02180	0.00940	0.01870	0.00810	0.01620
46	0.17780	0.09360	0.08400	0.05280	0.05120	0.04280	0.02240	0.02040	0.01440	0.01080	0.02180	0.01790	0.01430	0.01400	0.01620
47	0.17780	0.09360	0.08400	0.05280	0.05120	0.04280	0.02240	0.02040	0.01440	0.01080	0.02180	0.01790	0.01430	0.01400	0.01620
48	0.17780	0.09360	0.08400	0.05280	0.05120	0.04280	0.02240	0.01860	0.01330	0.01810	0.02180	0.01790	0.01430	0.01400	0.01620
49	0.17780	0.09360	0.08400	0.09110	0.07200	0.04280	0.02240	0.01860	0.01330	0.01810	0.02180	0.01790	0.01430	0.01400	0.01620
50	0.15750	0.09360	0.08400	0.09110	0.07200	0.04280	0.02240	0.01860	0.01330	0.01810	0.01200	0.01790	0.01430	0.01400	0.01620
51	0.15750	0.09200	0.08400	0.07570	0.05920	0.03990	0.02240	0.01860	0.01330	0.01810	0.01200	0.01790	0.01430	0.01400	0.01620
52	0.15750	0.09200	0.08400	0.07570	0.05920	0.03990	0.02000	0.01860	0.02710	0.01810	0.01200	0.01790	0.01430	0.01400	0.00620
53	0.15750	0.09200	0.07180	0.07570	0.05920	0.03990	0.02890	0.01860	0.02710	0.01810	0.01110	0.02280	0.00620	0.01400	0.00620
54	0.15750	0.09200	0.07180	0.06460	0.05920	0.03990	0.02890	0.01860	0.02710	0.01810	0.01110	0.02280	0.00620	0.01400	0.00620
55	0.15750	0.09200	0.07180	0.06460	0.05920	0.03990	0.03840	0.01790	0.01700	0.01280	0.00940	0.01740	0.01030	0.00990	0.01040
56	0.15750	0.09200	0.07180	0.06460	0.03320	0.03990	0.03840	0.01790	0.01090	0.01280	0.00940	0.01740	0.01030	0.00990	0.01040
57	0.15750	0.09200	0.07180	0.06460	0.03320	0.03990	0.03840	0.01790	0.01090	0.01280	0.00940	0.01740	0.01030	0.00990	0.01040
58	0.15750	0.09200	0.07180	0.06460	0.03320	0.03990	0.03840	0.01790	0.01090	0.01280	0.00940	0.01740	0.01030	0.00990	0.01040
59	0.15750	0.09200	0.07180	0.06460	0.03320	0.03990	0.03840	0.01790	0.01090	0.01280	0.00940	0.01740	0.01030	0.00990	0.01040



**Table A-8
Mortality Rates for Non-Disabled Annuitants and Survivors**

Age	Males		Females	
	Current	Recommended	Current	Recommended
50	0.00160	0.00298	0.00119	0.00233
51	0.00180	0.00321	0.00134	0.00246
52	0.00193	0.00346	0.00152	0.00259
53	0.00211	0.00372	0.00173	0.00272
54	0.00231	0.00401	0.00198	0.00286
55	0.00267	0.00431	0.00231	0.00301
56	0.00314	0.00463	0.00274	0.00318
57	0.00357	0.00497	0.00315	0.00336
58	0.00407	0.00533	0.00355	0.00358
59	0.00459	0.00573	0.00402	0.00384
60	0.00521	0.00615	0.00457	0.00416
61	0.00603	0.00661	0.00526	0.00454
62	0.00688	0.00713	0.00602	0.00500
63	0.00799	0.00770	0.00692	0.00552
64	0.00900	0.00836	0.00702	0.00613
65	0.01017	0.00913	0.00790	0.00682
66	0.01169	0.01003	0.00892	0.00760
67	0.01304	0.01108	0.00990	0.00849
68	0.01426	0.01229	0.01095	0.00950
69	0.01580	0.01368	0.01210	0.01063
70	0.01744	0.01526	0.01363	0.01191
71	0.01929	0.01703	0.01483	0.01335
72	0.02142	0.01904	0.01649	0.01497
73	0.02386	0.02129	0.01796	0.01679
74	0.02662	0.02384	0.01991	0.01883
75	0.03019	0.02671	0.02154	0.02111
76	0.03365	0.02995	0.02373	0.02368
77	0.03805	0.03361	0.02667	0.02658
78	0.04297	0.03775	0.02940	0.02986
79	0.04853	0.04243	0.03246	0.03360
80	0.05481	0.04774	0.03588	0.03787
81	0.06234	0.05374	0.04412	0.04276



**Table A-8
Mortality Rates for Non-Disabled Annuitants and Survivors**

Age	Males		Females	
	Current	Recommended	Current	Recommended
82	0.07078	0.06052	0.04892	0.04834
83	0.07338	0.06811	0.05431	0.05474
84	0.08293	0.07656	0.06041	0.06205
85	0.09205	0.08591	0.06866	0.07041
86	0.10206	0.09615	0.07814	0.07987
87	0.11491	0.10733	0.08892	0.09046
88	0.12926	0.11947	0.09904	0.10216
89	0.14284	0.13260	0.11221	0.11487
90	0.15997	0.14672	0.12400	0.12833
91	0.17425	0.16170	0.13617	0.14239
92	0.19199	0.17745	0.14843	0.15702
93	0.22270	0.19392	0.16374	0.17228
94	0.23893	0.21107	0.17562	0.18825
95	0.26324	0.22888	0.19142	0.20505
96	0.27939	0.24731	0.20212	0.22278
97	0.29509	0.26634	0.21352	0.24147
98	0.31278	0.28589	0.22216	0.26113
99	0.32758	0.30586	0.22954	0.28160
100	0.34181	0.32609	0.23557	0.30265
101	0.35863	0.34636	0.24483	0.32382
102	0.37169	0.36640	0.25450	0.34494
103	0.38304	0.38604	0.26604	0.36581
104	0.39200	0.40512	0.27906	0.38625
105	0.39789	0.42352	0.29312	0.40609
106	0.40000	0.44113	0.30781	0.42519
107	0.40000	0.45786	0.32273	0.44341
108	0.40000	0.47364	0.33744	0.46067
109	0.40000	0.48843	0.35154	0.47690
110	0.40000	0.50000	0.36462	0.49205
111	0.40000	0.50000	0.37625	0.50000
112	0.40000	0.50000	0.38602	0.50000
113	0.40000	0.50000	0.39351	0.50000



Table A-8
Mortality Rates for Non-Disabled Annuitants and Survivors

Age	Males		Females	
	Current	Recommended	Current	Recommended
114	0.40000	0.50000	0.39831	0.50000
115	0.40000	0.50000	0.40000	0.50000
116	0.40000	0.50000	0.40000	0.50000
117	0.40000	0.50000	0.40000	0.50000
118	0.40000	0.50000	0.40000	0.50000
119	0.40000	0.50000	0.40000	0.50000
120	1.00000	1.00000	1.00000	1.00000



**Table A-9
Mortality Rates for Disabled Annuitants**

Age	Males		Females	
	Current	Recommended	Current	Recommended
30	0.02032	0.00391	0.00628	0.00307
31	0.02032	0.00411	0.00650	0.00336
32	0.02032	0.00434	0.00650	0.00367
33	0.02032	0.00458	0.00639	0.00401
34	0.02032	0.00486	0.00628	0.00438
35	0.02032	0.00518	0.00617	0.00479
36	0.02032	0.00555	0.00607	0.00524
37	0.02032	0.00597	0.00597	0.00574
38	0.01989	0.00645	0.00586	0.00629
39	0.01948	0.00700	0.00576	0.00689
40	0.01907	0.00763	0.00576	0.00754
41	0.01867	0.00834	0.00576	0.00825
42	0.01828	0.00916	0.00576	0.00902
43	0.01789	0.01007	0.00576	0.00985
44	0.01752	0.01109	0.00576	0.01073
45	0.01715	0.01221	0.00566	0.01167
46	0.01774	0.01342	0.00612	0.01267
47	0.01829	0.01470	0.00658	0.01373
48	0.01882	0.01605	0.00718	0.01483
49	0.01932	0.01712	0.00781	0.01535
50	0.01979	0.01818	0.00862	0.01587
51	0.02023	0.01921	0.00949	0.01640
52	0.02065	0.02020	0.01059	0.01692
53	0.02150	0.02114	0.01178	0.01742
54	0.02234	0.02201	0.01306	0.01789
55	0.02369	0.02280	0.01443	0.01833
56	0.02508	0.02355	0.01589	0.01874
57	0.02653	0.02428	0.01713	0.01914
58	0.02803	0.02503	0.01810	0.01956
59	0.02898	0.02584	0.01907	0.02000
60	0.02996	0.02677	0.02006	0.02051
61	0.03165	0.02785	0.02106	0.02110



**Table A-9
Mortality Rates for Disabled Annuitants**

Age	Males		Females	
	Current	Recommended	Current	Recommended
62	0.03275	0.02908	0.02211	0.02178
63	0.03465	0.03044	0.02323	0.02256
64	0.03593	0.03193	0.02443	0.02346
65	0.03732	0.03353	0.02574	0.02450
66	0.03967	0.03524	0.02718	0.02569
67	0.04137	0.03706	0.02877	0.02706
68	0.04233	0.03901	0.03052	0.02862
69	0.04434	0.04113	0.03245	0.03039
70	0.04556	0.04344	0.03456	0.03239
71	0.04794	0.04599	0.03624	0.03464
72	0.05053	0.04880	0.03868	0.03718
73	0.05336	0.05192	0.04062	0.04003
74	0.05643	0.05537	0.04339	0.04322
75	0.06104	0.05921	0.04556	0.04678
76	0.06467	0.06347	0.04866	0.05075
77	0.07001	0.06822	0.05284	0.05517
78	0.07578	0.07348	0.05639	0.06007
79	0.08196	0.07929	0.06016	0.06550
80	0.08856	0.08565	0.06417	0.07150
81	0.09556	0.09259	0.06845	0.07811
82	0.10296	0.10010	0.07304	0.08536
83	0.10842	0.10815	0.07795	0.09331
84	0.11642	0.11678	0.08324	0.10163
85	0.12218	0.12605	0.09046	0.11014
86	0.12802	0.13603	0.09835	0.11878
87	0.13681	0.14861	0.10697	0.12757
88	0.14598	0.16253	0.11440	0.13665
89	0.15233	0.17681	0.12445	0.14617
90	0.16860	0.19126	0.13308	0.15635
91	0.18364	0.20588	0.14224	0.16740
92	0.20336	0.22078	0.15196	0.17955
93	0.21938	0.23617	0.16473	0.19298



**Table A-9
Mortality Rates for Disabled Annuitants**

Age	Males		Females	
	Current	Recommended	Current	Recommended
94	0.23536	0.25226	0.17668	0.20784
95	0.25648	0.26924	0.18800	0.22444
96	0.27222	0.28723	0.19851	0.24226
97	0.28751	0.30624	0.21161	0.26135
98	0.30874	0.32609	0.22017	0.28160
99	0.32334	0.34636	0.22748	0.30265
100	0.33739	0.36640	0.23346	0.32382
101	0.35863	0.38604	0.24483	0.34494
102	0.37169	0.40512	0.25450	0.36581
103	0.38304	0.42352	0.26604	0.38625
104	0.39200	0.44113	0.27906	0.40609
105	0.39789	0.45786	0.29312	0.42519
106	0.40000	0.47364	0.30781	0.44341
107	0.40000	0.48843	0.32273	0.46067
108	0.40000	0.50000	0.33744	0.47690
109	0.40000	0.50000	0.35154	0.49205
110	0.40000	0.50000	0.36462	0.50000
111	0.40000	0.50000	0.37625	0.50000
112	0.40000	0.50000	0.38602	0.50000
113	0.40000	0.50000	0.39351	0.50000
114	0.40000	0.50000	0.39831	0.50000
115	0.40000	0.50000	0.40000	0.50000
116	0.40000	0.50000	0.40000	0.50000
117	0.40000	0.50000	0.40000	0.50000
118	0.40000	0.50000	0.40000	0.50000
119	0.40000	0.50000	0.40000	0.50000
120	1.00000	1.00000	1.00000	1.00000



Table A-10 Superannuation Retirement Rates for State Police		
Service	Males & Females	
	Current	Recommended
20	0.01000	0.07500
21	0.01000	0.07500
22	0.01000	0.07500
23	0.01000	0.07500
24	0.50000	0.60000
25	0.70000	0.60000
26	0.40000	0.25000
27	0.40000	0.25000
28	0.40000	0.25000
29	0.40000	0.25000
30	0.50000	0.25000
31	0.40000	0.25000
32	0.40000	0.25000
33	0.50000	0.25000
34	0.50000	0.25000
35	0.50000	0.25000
36	0.50000	0.40000
37	0.50000	0.40000
38	0.50000	0.40000
39	0.50000	0.40000
40	1.00000	1.00000



Table A-11 Superannuation Retirement Rates for Hazardous Duty Employees		
Age	Males & Females	
	Current	Recommended
49	0.10000	0.10000
50	0.10000	0.15000
51	0.10000	0.10000
52	0.10000	0.10000
53	0.10000	0.10000
54	0.10000	0.10000
55	0.10000	0.12000
56	0.10000	0.10000
57	0.10000	0.10000
58	0.10000	0.10000
59	0.10000	0.12000
60	0.19000	0.16000
61	0.19000	0.16000
62	0.19000	0.20000
63	0.19000	0.20000
64	0.19000	0.20000
65	0.27000	0.23000
66	0.27000	0.30000
67	0.27000	0.25000
68	0.27000	0.25000
69	0.27000	0.20000
70	0.27000	0.20000
71 to 79	0.32000	0.20000
80	1.00000	1.00000



Table A-12 Early Retirement Rates for State Police and Hazardous Duty Employees		
Age	Males & Females	
	Current	Recommended
17 to 49	0.0140	0.0150
50 to 59	0.0000	0.0000

Table A-13 Withdrawal Rates for State Police and Hazardous Duty Employees		
Service	Males & Females	
	Current	Recommended
0	0.0900	0.0900
1	0.0400	0.0500
2	0.0300	0.0300
3	0.0300	0.0300
4	0.0200	0.0200
5	0.0100	0.0200
6	0.0100	0.0100
7	0.0050	0.0055
8	0.0050	0.0055
9	0.0050	0.0055
10	0.0020	0.0030



Table A-14 Superannuation Retirement Rates for Legislators		
Age	Males & Females	
	Current	Recommended
49	0.05000	0.07000
50	0.05000	0.07000
51	0.05000	0.07000
52	0.05000	0.07000
53	0.05000	0.07000
54	0.05000	0.07000
55	0.05000	0.07000
56	0.05000	0.07000
57	0.05000	0.07000
58	0.05000	0.07000
59	0.05000	0.07000
60	0.05000	0.07000
61	0.05000	0.07000
62	0.05000	0.07000
63	0.11000	0.11000
64	0.11000	0.11000
65	0.11000	0.11000
66	0.11000	0.11000
67	0.11000	0.11000
68	0.11000	0.11000
69	0.11000	0.11000
70	0.15000	0.09000
71	0.15000	0.09000
72	0.15000	0.09000
73 +	0.15000	0.09000

Table A-15 Early Retirement Rates for Legislators		
Age	Males & Females	
	Current	Recommended
17 to 49	0.0270	0.0290
50 to 59	0.0000	0.0000



Table A-16		
Withdrawal Rates for Legislators		
Service	Males & Females	
	Current	Recommended
0	0.04000	0.04000
1	0.04000	0.04000
2	0.04000	0.04000
3	0.04000	0.04000
4	0.04000	0.04000
5	0.04000	0.04000
6	0.04000	0.04000
7	0.12000	0.04000
8	0.12000	0.04000
9	0.12000	0.04000
10	0.01600	0.04000

Table A-17		
Superannuation Retirement Rates for Judicial Officers		
Age	Males & Females	
	Current	Recommended
49 to 58	0.0500	0.0500
59	0.0500	0.0500
60	0.0500	0.0500
61	0.0500	0.0500
62	0.0500	0.0500
63	0.0500	0.0500
64	0.0500	0.0500
65	0.1000	0.1000
66	0.1000	0.1000
67	0.1000	0.1000
68	0.1000	0.1000
69	0.1000	0.2000
70	1.0000	0.2500
71	1.0000	0.2000
72	1.0000	0.2000
73	1.0000	0.2000
74	1.0000	0.2000
75	1.0000	1.0000



Table A-18		
Early Retirement Rates for Judicial Officers		
Age	Males & Females	
	Current	Recommended
17 to 49	0.00200	0.01000
50 to 59	0.01800	0.01000

Table A-19		
Withdrawal Rates for Judicial Officers		
Service	Males & Females	
	Current	Recommended
0	0.0100	0.0300
1	0.0100	0.0300
2	0.0030	0.0040
3	0.0030	0.0040
4	0.0030	0.0040
5	0.0030	0.0040
6	0.0030	0.0040
7	0.0030	0.0040
8	0.0030	0.0040
9	0.0030	0.0040
10	0.0030	0.0040



Table A-20 Early Retirement Rates for Class A-3 and Class A-4 Active General Employees with 10 or more Years of Service		
Ages	Males & Females	
	Current	Recommended
31 to 46	0.01500	0.01500
47	0.02000	0.02000
48	0.02000	0.02000
49	0.02000	0.02000
50	0.02000	0.02000
51	0.03000	0.03000
52	0.04000	0.04000
53	0.04500	0.04500
54	0.05000	0.05000
55	0.05500	0.05500
56	0.05500	0.05500
57	0.05500	0.05500
58	0.05500	0.05500
59	0.05500	0.05500
60	0.05500	0.05500
61	0.06000	0.06000
62	0.20000	0.20000
63	0.10000	0.10000
64	0.15000	0.15000
65	0.00000	0.00000

It should be noted that the above rates in Table A-20 were not based upon the actual experience of Class A-3 and Class A-4 members. Rather, these rates were developed by Korn Ferry at the time of the 2011 actuarial experience study, based upon our past SERS experience and professional judgment. In Korn Ferry's opinion, these rates remain reasonable and appropriate for use until such time as actual Class A-3 and Class A-4 early retirement experience becomes available, at which time they will be updated.



Table A-21 Superannuation Retirement Rates for Class A-3 and Class A-4 General Employees		
Age	Males & Females	
	Current Superannuation Retirement Rates	Recommended Superannuation Retirement Rates
55	0.15	0.15
56	0.16	0.16
57	0.17	0.17
58	0.18	0.18
59	0.19	0.19
60	0.20	0.20
61	0.20	0.20
62	0.25	0.25
63	0.20	0.20
64	0.20	0.20
65	0.25	0.25
66 to 79	0.20	0.20
80	1.00	1.00

It should be noted that the above rates in Table A-21 were not based upon the actual experience of Class A-3 and Class A-4 members. Rather, these rates were developed by Korn Ferry at the time of the 2011 actuarial experience study, based upon our past SERS experience and professional judgment. In Korn Ferry's opinion, these rates remain reasonable and appropriate for use until such time as actual Class A-3 and Class A-4 superannuation retirement experience becomes available, at which time they will be updated.



Table A-22 Early Retirement Rates for Class A-5 and Class A-6 Active General Employees with 10 or more Years of Service		
Ages	Males & Females	
	Current	Recommended
31 to 46	0.01500	0.01500
47	0.02000	0.02000
48	0.02000	0.02000
49	0.02000	0.02000
50	0.02000	0.02000
51	0.03000	0.03000
52	0.04000	0.04000
53	0.04500	0.04500
54	0.05000	0.05000
55	0.05500	0.05500
56	0.05500	0.05500
57	0.05500	0.05500
58	0.05500	0.05500
59	0.05500	0.05500
60	0.05500	0.05500
61	0.06000	0.06000
62	0.08000	0.08000
63	0.10000	0.10000
64	0.10000	0.10000
65	0.15000	0.15000
66	0.20000	0.20000
67	0.00000	0.00000

It should be noted that the above rates in Table A-22 were not based upon the actual experience of Class A-5 and Class A-6 members. Rather, these rates were developed by Korn Ferry at the time of the 2019 actuarial valuation, based upon our past SERS experience and professional judgment. In Korn Ferry's opinion, these rates remain reasonable and appropriate for use until such time as actual Class A-5 and Class A-6 early retirement experience becomes available, at which time they will be updated.



Table A-23 Superannuation Retirement Rates for Class A-5 and Class A-6 General Employees		
Age	Males & Females	
	Current Superannuation Retirement Rates	Recommended Superannuation Retirement Rates
55	0.15	0.15
56	0.16	0.16
57	0.17	0.17
58	0.18	0.18
59	0.19	0.19
60	0.20	0.20
61	0.20	0.20
62	0.25	0.25
63	0.20	0.20
64	0.20	0.20
65	0.25	0.25
66 to 79	0.20	0.20
80	1.00	1.00

It should be noted that the above rates in Table A-23 were not based upon the actual experience of Class A-5 and Class A-6 members. Rather, these rates were developed by Korn Ferry at the time of the 2019 actuarial valuation, based upon our past SERS experience and professional judgment. In Korn Ferry's opinion, these rates remain reasonable and appropriate for use until such time as actual Class A-5 and Class A-6 superannuation retirement experience becomes available, at which time they will be updated.



**Nineteenth Investigation of Actuarial Experience of the State Employees'
Retirement System of the Commonwealth of Pennsylvania
Review of Experience from January 1, 2015 to December 31, 2019**

Supplemental Tables

Underlying Details of Demographic Experience Study Results

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

EXPERIENCE STUDY RESULTS SUMMARY				
Table Number		Calendar Years 2015 - 2019		
		Ratio of Actual to		Average Number of Decrements Per Year
		Expected	Recommended*	
1	Active Member Pre Retirement Mortality			
	Males	0.81	0.90	76.8
	Females	0.84	0.90	41.4
2	Non Disabled Annuitant and Survivor Mortality			
	Males	0.90	1.04	\$3,094.2K
	Females	0.97	1.02	\$1,830.2K
3	Disabled Annuitant Mortality			
	Males	0.92	1.03	\$185.6K
	Females	1.09	1.06	\$153.2K
4	Active Member Ordinary Disability			
	Males	0.67	0.90	73.0
	Females	0.76	0.90	91.0
	Rate of Early Retirements			
5	5-14 Years of Service			
	Males	0.95	1.00	154.6
	Females	0.93	1.00	206.4
6	15 or More Years of Service			
	Males	0.77	1.00	401.6
	Females	0.80	1.00	409.0
7	Rate of Superannuation Retirement			
	Males	0.89	0.95	1,290.0
	Females	0.93	0.95	1,191.6
8	Withdrawal Rates for Active Members			
	Males	1.22	1.00	1,536.8
	Females	1.25	1.00	1,817.8

* If blank, no assumption change is being recommended

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 1A

Calendar Years 2015 - 2019

Mortality Experience of Active General Employees

Males

Age	Life Years Exposed	Number of Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
17	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0431%	0.0560%
18	11	0	0.0	0.0	0.00	0.00	0.0000%	0.0431%	0.0560%
19	149	0	0.1	0.1	0.00	0.00	0.0000%	0.0431%	0.0560%
20	327	0	0.1	0.2	0.00	0.00	0.0000%	0.0431%	0.0560%
21	571	0	0.2	0.3	0.00	0.00	0.0000%	0.0431%	0.0560%
22	863	1	0.4	0.5	2.69	2.07	0.1159%	0.0431%	0.0560%
23	1,231	0	0.5	0.7	0.00	0.00	0.0000%	0.0431%	0.0560%
24	1,754	1	0.8	1.0	1.32	1.02	0.0570%	0.0431%	0.0560%
25	2,006	2	0.9	1.1	2.32	1.78	0.0997%	0.0431%	0.0560%
26	2,274	0	1.0	1.3	0.00	0.00	0.0000%	0.0431%	0.0560%
27	2,740	1	1.2	1.5	0.85	0.65	0.0365%	0.0431%	0.0560%
28	2,956	4	1.3	1.7	3.14	2.42	0.1353%	0.0431%	0.0560%
29	3,034	2	1.3	1.7	1.53	1.18	0.0659%	0.0431%	0.0560%
30	3,428	1	1.8	2.4	0.54	0.42	0.0292%	0.0538%	0.0700%
31	3,501	3	1.9	2.4	1.59	1.22	0.0857%	0.0538%	0.0700%
32	3,636	5	2.0	2.5	2.55	1.97	0.1375%	0.0538%	0.0700%
33	3,749	3	2.0	2.6	1.49	1.14	0.0800%	0.0538%	0.0700%
34	3,862	2	2.1	2.7	0.96	0.74	0.0518%	0.0538%	0.0700%
35	3,949	2	2.3	3.0	0.86	0.66	0.0506%	0.0592%	0.0770%
36	4,105	3	2.7	3.4	1.13	0.87	0.0731%	0.0646%	0.0840%
37	4,070	3	2.8	3.7	1.05	0.81	0.0737%	0.0700%	0.0910%
38	4,083	6	3.1	4.0	1.95	1.50	0.1470%	0.0754%	0.0980%
39	4,105	3	3.3	4.3	0.91	0.70	0.0731%	0.0807%	0.1050%
40	4,089	4	3.5	4.6	1.14	0.87	0.0978%	0.0861%	0.1120%
41	4,215	3	3.9	5.0	0.78	0.60	0.0712%	0.0915%	0.1190%
42	4,232	5	4.1	5.3	1.22	0.94	0.1181%	0.0969%	0.1260%
43	4,473	4	4.6	5.9	0.87	0.67	0.0894%	0.1023%	0.1330%
44	4,896	5	5.3	6.9	0.95	0.73	0.1021%	0.1077%	0.1400%
45	5,201	4	6.7	7.5	0.60	0.54	0.0769%	0.1292%	0.1435%
46	5,338	7	8.0	7.7	0.87	0.90	0.1311%	0.1507%	0.1449%
47	5,569	7	9.6	8.2	0.73	0.86	0.1257%	0.1723%	0.1464%
48	5,592	9	10.8	9.2	0.83	0.98	0.1609%	0.1938%	0.1647%
49	5,730	11	12.3	10.5	0.89	1.05	0.1920%	0.2153%	0.1830%
50	5,985	10	14.2	12.0	0.71	0.83	0.1671%	0.2368%	0.2013%
51	6,131	7	15.2	12.9	0.46	0.54	0.1142%	0.2476%	0.2105%
52	6,465	6	16.7	14.2	0.36	0.42	0.0928%	0.2584%	0.2196%
53	6,797	10	18.3	15.5	0.55	0.64	0.1471%	0.2691%	0.2288%
54	6,879	14	19.3	16.4	0.73	0.86	0.2035%	0.2799%	0.2379%
55	7,043	22	20.5	17.4	1.07	1.26	0.3124%	0.2907%	0.2471%
56	6,997	8	21.1	17.9	0.38	0.45	0.1143%	0.3014%	0.2562%
57	6,925	17	21.6	18.4	0.79	0.93	0.2455%	0.3122%	0.2654%
58	6,825	18	22.0	18.7	0.82	0.96	0.2637%	0.3230%	0.2745%
59	6,755	18	22.5	19.2	0.80	0.94	0.2665%	0.3337%	0.2837%
60	6,087	19	21.0	17.8	0.91	1.07	0.3121%	0.3445%	0.2928%
61	5,204	20	19.0	16.2	1.05	1.24	0.3843%	0.3660%	0.3111%
62	4,654	12	18.0	15.3	0.67	0.78	0.2578%	0.3876%	0.3294%
63	3,800	14	15.5	13.2	0.90	1.06	0.3684%	0.4091%	0.3477%
64	3,126	9	13.5	11.4	0.67	0.79	0.2879%	0.4306%	0.3660%
65	2,568	16	12.4	10.6	1.29	1.51	0.6231%	0.4845%	0.4118%
66	1,985	7	10.7	9.1	0.66	0.77	0.3526%	0.5383%	0.4575%
67	1,503	15	8.9	7.6	1.69	1.98	0.9980%	0.5921%	0.5033%
68	1,206	10	8.0	6.8	1.24	1.46	0.8292%	0.6675%	0.5674%
69	1,004	3	7.6	6.4	0.40	0.47	0.2988%	0.7536%	0.6406%
70	673	2	5.8	4.9	0.35	0.41	0.2972%	0.8613%	0.7321%
71	528	4	5.1	4.3	0.78	0.92	0.7576%	0.9689%	0.8236%
72	402	3	4.3	3.7	0.69	0.82	0.7463%	1.0766%	0.9151%
73	296	1	3.8	3.3	0.26	0.31	0.3378%	1.2919%	1.0981%
74	231	4	3.6	3.1	1.11	1.31	1.7316%	1.5611%	1.3269%
75	210	2	3.8	3.3	0.52	0.61	0.9524%	1.8302%	1.5557%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 1A

Calendar Years 2015 - 2019

Mortality Experience of Active General Employees

Males

Age	Life Years Exposed	Number of Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
76	180	1	3.9	3.3	0.26	0.30	0.5556%	2.1532%	1.8302%
77	160	3	4.1	3.5	0.73	0.85	1.8750%	2.5838%	2.1962%
78	106	3	3.0	2.5	1.01	1.19	2.8302%	2.7991%	2.3793%
79	78	1	2.4	2.0	0.43	0.50	1.2821%	3.0144%	2.5623%
80	56	0	1.8	1.5	0.00	0.00	0.0000%	3.2298%	2.7453%
81	43	3	1.4	1.2	2.16	2.54	6.9767%	3.2298%	2.7453%
82	34	1	1.1	0.9	0.91	1.07	2.9412%	3.2298%	2.7453%
83	15	0	0.5	0.4	0.00	0.00	0.0000%	3.2298%	2.7453%
84	22	0	0.7	0.6	0.00	0.00	0.0000%	3.2298%	2.7453%
85	14	0	0.5	0.4	0.00	0.00	0.0000%	3.2298%	2.7453%
86	10	0	0.3	0.3	0.00	0.00	0.0000%	3.2298%	2.7453%
87	9	0	0.3	0.2	0.00	0.00	0.0000%	3.2298%	2.7453%
88	3	0	0.1	0.1	0.00	0.00	0.0000%	3.2298%	2.7453%
89	3	0	0.1	0.1	0.00	0.00	0.0000%	3.2298%	2.7453%
90	3	0	0.1	0.1	0.00	0.00	0.0000%	3.2298%	2.7453%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
93	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
94	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
95	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
96	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
97	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	3.2298%	2.7453%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	206,754	384	473.4	428.9	0.81	0.90	0.1857%	0.2290%	0.2074%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 1A

Calendar Years 2015 - 2019

Mortality Experience of Active General Employees

Females

Age	Life Years Exposed	Number of Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
17	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0100%	0.0136%
18	22	0	0.0	0.0	0.00	0.00	0.0000%	0.0100%	0.0136%
19	157	0	0.0	0.0	0.00	0.00	0.0000%	0.0200%	0.0272%
20	395	0	0.1	0.1	0.00	0.00	0.0000%	0.0200%	0.0272%
21	689	0	0.1	0.2	0.00	0.00	0.0000%	0.0200%	0.0272%
22	924	1	0.2	0.3	5.41	3.98	0.1082%	0.0200%	0.0272%
23	1,419	0	0.3	0.4	0.00	0.00	0.0000%	0.0200%	0.0272%
24	1,837	0	0.4	0.5	0.00	0.00	0.0000%	0.0200%	0.0272%
25	2,170	0	0.4	0.6	0.00	0.00	0.0000%	0.0200%	0.0272%
26	2,494	0	0.5	0.7	0.00	0.00	0.0000%	0.0200%	0.0272%
27	2,727	0	0.5	0.7	0.00	0.00	0.0000%	0.0200%	0.0272%
28	2,975	0	0.6	0.8	0.00	0.00	0.0000%	0.0200%	0.0272%
29	3,116	2	0.6	0.8	3.21	2.36	0.0642%	0.0200%	0.0272%
30	3,279	1	0.7	0.9	1.52	1.12	0.0305%	0.0200%	0.0272%
31	3,417	5	0.7	0.9	7.32	5.38	0.1463%	0.0200%	0.0272%
32	3,667	2	0.7	1.0	2.73	2.01	0.0545%	0.0200%	0.0272%
33	3,861	1	1.2	1.6	0.86	0.63	0.0259%	0.0300%	0.0408%
34	4,036	1	1.2	1.6	0.83	0.61	0.0248%	0.0300%	0.0408%
35	4,156	2	1.2	1.7	1.60	1.18	0.0481%	0.0300%	0.0408%
36	4,332	3	1.3	1.8	2.31	1.70	0.0693%	0.0300%	0.0408%
37	4,356	0	1.7	2.4	0.00	0.00	0.0000%	0.0400%	0.0544%
38	4,360	2	1.7	2.4	1.15	0.84	0.0459%	0.0400%	0.0544%
39	4,381	2	1.8	2.4	1.14	0.84	0.0457%	0.0400%	0.0544%
40	4,423	0	1.8	2.4	0.00	0.00	0.0000%	0.0400%	0.0544%
41	4,429	3	1.8	2.4	1.69	1.25	0.0677%	0.0400%	0.0544%
42	4,480	5	2.0	2.7	2.48	1.82	0.1116%	0.0450%	0.0612%
43	4,608	3	2.3	3.1	1.30	0.96	0.0651%	0.0500%	0.0680%
44	4,966	4	2.7	3.7	1.46	1.08	0.0805%	0.0550%	0.0748%
45	5,258	4	3.2	4.3	1.27	0.93	0.0761%	0.0600%	0.0816%
46	5,560	3	3.6	4.9	0.83	0.61	0.0540%	0.0650%	0.0884%
47	5,824	5	4.1	5.5	1.23	0.90	0.0859%	0.0700%	0.0952%
48	5,979	7	4.5	6.1	1.56	1.15	0.1171%	0.0750%	0.1020%
49	6,060	4	4.8	6.5	0.83	0.61	0.0660%	0.0800%	0.1077%
50	6,143	5	5.2	6.7	0.96	0.75	0.0814%	0.0850%	0.1089%
51	6,302	11	5.7	6.9	1.94	1.59	0.1745%	0.0900%	0.1101%
52	6,569	3	6.2	7.3	0.48	0.41	0.0457%	0.0950%	0.1113%
53	6,835	8	6.8	7.7	1.17	1.04	0.1170%	0.1000%	0.1125%
54	7,015	6	8.4	8.0	0.71	0.75	0.0855%	0.1200%	0.1137%
55	6,995	11	9.8	8.3	1.12	1.32	0.1573%	0.1400%	0.1192%
56	6,936	11	11.1	8.7	0.99	1.27	0.1586%	0.1600%	0.1248%
57	6,901	4	12.4	9.7	0.32	0.41	0.0580%	0.1800%	0.1404%
58	6,872	15	13.7	10.7	1.09	1.40	0.2183%	0.2000%	0.1560%
59	6,555	10	14.4	11.2	0.69	0.89	0.1526%	0.2200%	0.1716%
60	5,899	10	14.2	11.0	0.71	0.91	0.1695%	0.2400%	0.1872%
61	4,802	8	12.5	9.7	0.64	0.82	0.1666%	0.2600%	0.2028%
62	4,090	6	11.5	8.9	0.52	0.67	0.1467%	0.2800%	0.2184%
63	3,247	9	9.7	7.6	0.92	1.18	0.2772%	0.3000%	0.2340%
64	2,690	5	9.4	7.3	0.53	0.68	0.1859%	0.3500%	0.2730%
65	2,078	2	8.3	6.5	0.24	0.31	0.0962%	0.4000%	0.3120%
66	1,473	2	6.6	5.2	0.30	0.39	0.1358%	0.4500%	0.3510%
67	1,019	3	5.1	4.0	0.59	0.75	0.2944%	0.5000%	0.3900%
68	810	7	4.9	3.8	1.44	1.85	0.8642%	0.6000%	0.4680%
69	582	2	4.1	3.2	0.49	0.63	0.3436%	0.7000%	0.5460%
70	437	3	3.5	2.7	0.86	1.10	0.6865%	0.8000%	0.6240%
71	315	0	2.8	2.2	0.00	0.00	0.0000%	0.9000%	0.7020%
72	250	2	2.5	2.0	0.80	1.03	0.8000%	1.0000%	0.7800%
73	177	0	1.9	1.5	0.00	0.00	0.0000%	1.1000%	0.8580%
74	140	2	1.7	1.3	1.19	1.53	1.4286%	1.2000%	0.9360%
75	104	0	1.4	1.1	0.00	0.00	0.0000%	1.3000%	1.0140%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 1A

Calendar Years 2015 - 2019

Mortality Experience of Active General Employees

Females

Age	Life Years Exposed	Number of Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
76	85	0	1.2	0.9	0.00	0.00	0.0000%	1.4000%	1.0920%
77	51	0	0.8	0.6	0.00	0.00	0.0000%	1.5000%	1.1700%
78	39	0	0.6	0.5	0.00	0.00	0.0000%	1.6000%	1.2480%
79	34	0	0.6	0.5	0.00	0.00	0.0000%	1.7000%	1.3260%
80	24	0	0.4	0.3	0.00	0.00	0.0000%	1.8000%	1.4040%
81	17	0	0.3	0.3	0.00	0.00	0.0000%	1.9000%	1.4820%
82	15	1	0.3	0.2	3.33	4.27	6.6667%	2.0000%	1.5600%
83	13	1	0.3	0.2	3.85	4.93	7.6923%	2.0000%	1.5600%
84	7	0	0.1	0.1	0.00	0.00	0.0000%	2.0000%	1.5600%
85	5	0	0.1	0.1	0.00	0.00	0.0000%	2.0000%	1.5600%
86	6	0	0.1	0.1	0.00	0.00	0.0000%	2.0000%	1.5600%
87	2	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
88	2	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
89	1	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
90	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
93	1	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
94	1	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
95	1	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
96	1	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
97	1	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.5600%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
<i>Total</i>	<i>205,900</i>	<i>207</i>	<i>245.7</i>	<i>230.8</i>	<i>0.84</i>	<i>0.90</i>	<i>0.1005%</i>	<i>0.1193%</i>	<i>0.1121%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 1A
Mortality Experience of Active General Employees
Calendar Years 2015 - 2019
Males

Age	Life Years Exposed	Number of Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	4,906	2	2.1	2.7	0.95	0.73	0.0408%	0.0431%	0.0560%
25-29	13,010	9	5.6	7.3	1.61	1.24	0.0692%	0.0431%	0.0560%
30-34	18,176	14	9.8	12.7	1.43	1.10	0.0770%	0.0538%	0.0700%
35-39	20,312	17	14.2	18.5	1.19	0.92	0.0837%	0.0701%	0.0911%
40-44	21,905	21	21.3	27.7	0.98	0.76	0.0959%	0.0974%	0.1266%
45-49	27,430	38	47.5	43.1	0.80	0.88	0.1385%	0.1733%	0.1570%
50-54	32,257	47	83.6	71.1	0.56	0.66	0.1457%	0.2592%	0.2203%
55-59	34,545	83	107.8	91.6	0.77	0.91	0.2403%	0.3120%	0.2652%
60-64	22,871	74	87.1	74.0	0.85	1.00	0.3236%	0.3807%	0.3236%
65-69	8,266	51	47.6	40.5	1.07	1.26	0.6170%	0.5764%	0.4899%
70-74	2,130	14	22.7	19.3	0.62	0.73	0.6573%	1.0643%	0.9047%
75-79	734	10	17.2	14.6	0.58	0.69	1.3624%	2.3394%	1.9885%
80-84	170	4	5.5	4.7	0.73	0.86	2.3529%	3.2298%	2.7453%
85-89	39	0	1.3	1.1	0.00	0.00	0.0000%	3.2298%	2.7453%
90-94	3	0	0.1	0.1	0.00	0.00	0.0000%	3.2298%	2.7453%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	206,754	384	473.4	428.9	0.81	0.90	0.1857%	0.2290%	0.2074%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 1A Calendar Years 2011 - 2015
Mortality Experience of Active General Employees **Females**

Age	Life Years Exposed	Number of Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	5,444	1	1.1	1.5	0.92	0.68	0.0184%	0.0200%	0.02
25-29	13,482	2	2.7	3.7	0.74	0.55	0.0148%	0.0200%	0.02
30-34	18,260	10	4.4	6.0	2.25	1.66	0.0548%	0.0243%	0.03
35-39	21,585	9	7.8	10.6	1.16	0.85	0.0417%	0.0361%	0.04
40-44	22,906	15	10.6	14.4	1.42	1.04	0.0655%	0.0462%	0.06
45-49	28,681	23	20.2	27.4	1.14	0.84	0.0802%	0.0704%	0.09
50-54	32,864	33	32.4	36.6	1.02	0.90	0.1004%	0.0985%	0.11
55-59	34,259	51	61.5	48.7	0.83	1.05	0.1489%	0.1794%	0.14
60-64	20,728	38	57.3	44.7	0.66	0.85	0.1833%	0.2762%	0.21
65-69	5,962	16	29.0	22.6	0.55	0.71	0.2684%	0.4859%	0.37
70-74	1,319	7	12.5	9.7	0.56	0.72	0.5307%	0.9445%	0.73
75-79	313	0	4.5	3.5	0.00	0.00	0.0000%	1.4406%	1.12
80-84	76	2	1.5	1.1	1.37	1.76	2.6316%	1.9145%	1.49
85-89	16	0	0.3	0.2	0.00	0.00	0.0000%	2.0000%	1.56
90-94	2	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	1.56
95-99	3	0	0.1	0.0	0.00	0.00	0.0000%	2.0000%	1.56
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.00
<i>Total</i>	<i>205,900</i>	<i>207</i>	<i>245.7</i>	<i>230.8</i>	<i>0.84</i>	<i>0.90</i>	<i>0.1005%</i>	<i>0.1193%</i>	<i>0.11</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 1B

Mortality Experience of Active General Employees

Males

Year	Life Years Exposed	Number of Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	42,352	74	96.5	87.4	0.77	0.85	0.1747%	0.2278%	0.2064%
2016	41,927	70	95.4	86.4	0.73	0.81	0.1670%	0.2275%	0.2062%
2017	41,927	75	95.4	86.4	0.79	0.87	0.1789%	0.2275%	0.2062%
2018	40,493	93	93.6	84.7	0.99	1.10	0.2297%	0.2311%	0.2092%
2019	40,055	72	92.6	83.9	0.78	0.86	0.1798%	0.2312%	0.2095%
<i>Total</i>	<i>206,754</i>	<i>384</i>	<i>473.4</i>	<i>428.9</i>	<i>0.81</i>	<i>0.90</i>	<i>0.1857%</i>	<i>0.2290%</i>	<i>0.2075%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 1B

Mortality Experience of Active General Employees

Females

Year	Life Years Exposed	Number of Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	41,804	39	48.8	46.1	0.80	0.85	0.0933%	0.1167%	0.1102%
2016	41,818	31	49.0	46.2	0.63	0.67	0.0741%	0.1171%	0.1104%
2017	41,492	51	49.3	46.3	1.04	1.10	0.1229%	0.1187%	0.1115%
2018	40,583	38	49.2	46.0	0.77	0.83	0.0936%	0.1213%	0.1134%
2019	40,203	48	49.5	46.1	0.97	1.04	0.1194%	0.1231%	0.1147%
<i>Total</i>	<i>205,900</i>	<i>207</i>	<i>245.7</i>	<i>230.7</i>	<i>0.84</i>	<i>0.90</i>	<i>0.1005%</i>	<i>0.1193%</i>	<i>0.1120%</i>

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 2A

Calendar Years 2015 - 2019

Mortality Experience of Non Disabled Annuitants and Survivors

Males

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
30	20,921	0	8.6	9.4	0.00	0.00	0.0000%	0.0410%	0.0450%
31	26,283	773	12.1	12.6	63.85	61.14	2.9407%	0.0461%	0.0481%
32	26,142	0	13.6	13.3	0.00	0.00	0.0000%	0.0519%	0.0510%
33	44,101	0	25.7	23.7	0.00	0.00	0.0000%	0.0582%	0.0537%
34	43,470	0	28.2	24.4	0.00	0.00	0.0000%	0.0648%	0.0562%
35	50,771	0	36.2	30.2	0.00	0.00	0.0000%	0.0713%	0.0595%
36	68,950	63	53.5	43.1	1.19	1.47	0.0920%	0.0776%	0.0624%
37	81,540	0	68.0	53.0	0.00	0.00	0.0000%	0.0834%	0.0649%
38	101,376	1,330	88.8	69.1	14.98	19.23	1.3115%	0.0876%	0.0682%
39	106,479	43	97.2	75.6	0.45	0.57	0.0407%	0.0912%	0.0710%
40	132,254	1,753	125.5	98.5	13.97	17.79	1.3255%	0.0949%	0.0745%
41	133,854	1,741	132.3	103.9	13.16	16.76	1.3006%	0.0988%	0.0776%
42	152,176	425	157.4	124.0	2.70	3.42	0.2790%	0.1035%	0.0815%
43	190,468	730	207.3	162.4	3.52	4.49	0.3832%	0.1088%	0.0853%
44	343,759	6,678	395.9	309.3	16.87	21.59	1.9426%	0.1152%	0.0900%
45	657,398	220	804.1	629.2	0.27	0.35	0.0335%	0.1223%	0.0957%
46	1,236,324	1,160	1,594.4	1,268.8	0.73	0.91	0.0938%	0.1290%	0.1026%
47	2,332,022	6,911	3,175.1	2,562.4	2.18	2.70	0.2964%	0.1362%	0.1099%
48	3,612,888	1,151	5,191.5	4,315.7	0.22	0.27	0.0319%	0.1437%	0.1195%
49	4,696,995	11,661	7,122.3	6,083.6	1.64	1.92	0.2483%	0.1516%	0.1295%
50	6,150,248	33,411	9,833.0	17,246.1	3.40	1.94	0.5433%	0.1599%	0.2804%
51	7,396,396	6,012	13,326.4	22,479.8	0.45	0.27	0.0813%	0.1802%	0.3039%
52	7,684,511	29,316	14,833.9	25,404.1	1.98	1.15	0.3815%	0.1930%	0.3306%
53	7,826,072	37,497	16,517.7	28,128.7	2.27	1.33	0.4791%	0.2111%	0.3594%
54	8,115,775	31,138	18,773.9	31,828.5	1.66	0.98	0.3837%	0.2313%	0.3922%
55	8,703,241	31,205	23,204.6	37,163.4	1.34	0.84	0.3585%	0.2666%	0.4270%
56	9,487,643	37,496	29,798.3	44,086.0	1.26	0.85	0.3952%	0.3141%	0.4647%
57	10,400,466	46,207	37,098.8	52,512.4	1.25	0.88	0.4443%	0.3567%	0.5049%
58	11,523,406	71,938	46,941.9	63,046.7	1.53	1.14	0.6243%	0.4074%	0.5471%
59	12,724,869	89,278	58,442.2	75,428.1	1.53	1.18	0.7016%	0.4593%	0.5928%
60	15,221,061	90,124	79,337.3	97,261.9	1.14	0.93	0.5921%	0.5212%	0.6390%
61	19,172,916	96,541	115,558.7	131,728.4	0.84	0.73	0.5035%	0.6027%	0.6871%
62	21,685,691	165,186	149,110.5	160,041.1	1.11	1.03	0.7617%	0.6876%	0.7380%
63	24,536,240	207,613	196,046.7	194,019.2	1.06	1.07	0.8461%	0.7990%	0.7907%
64	26,653,560	212,122	239,935.8	226,282.7	0.88	0.94	0.7958%	0.9002%	0.8490%
65	28,847,739	220,318	293,230.8	263,831.0	0.75	0.84	0.7637%	1.0165%	0.9146%
66	31,036,317	348,483	362,725.8	307,395.3	0.96	1.13	1.1228%	1.1687%	0.9904%
67	33,291,912	416,646	434,074.4	359,213.2	0.96	1.16	1.2515%	1.3038%	1.0790%
68	35,852,811	421,516	511,331.7	423,695.6	0.82	0.99	1.1757%	1.4262%	1.1818%
69	35,346,739	487,660	558,584.7	460,122.2	0.87	1.06	1.3796%	1.5803%	1.3017%
70	33,540,724	451,875	584,820.3	482,939.6	0.77	0.94	1.3472%	1.7436%	1.4399%
71	31,514,218	526,960	607,982.9	503,290.2	0.87	1.05	1.6721%	1.9292%	1.5970%
72	28,692,207	571,972	614,616.1	510,295.3	0.93	1.12	1.9935%	2.1421%	1.7785%
73	24,031,324	524,834	573,383.5	476,752.8	0.92	1.10	2.1840%	2.3860%	1.9839%
74	21,762,555	493,108	579,281.0	482,968.0	0.85	1.02	2.2659%	2.6618%	2.2193%
75	20,172,524	486,284	609,078.3	501,677.6	0.80	0.97	2.4106%	3.0193%	2.4869%
76	17,987,216	570,278	605,324.0	502,100.0	0.94	1.14	3.1705%	3.3653%	2.7914%
77	15,633,770	507,201	594,794.0	490,477.9	0.85	1.03	3.2443%	3.8045%	3.1373%
78	13,813,081	506,507	593,514.1	487,721.3	0.85	1.04	3.6669%	4.2968%	3.5309%
79	12,349,992	468,395	599,360.9	491,112.7	0.78	0.95	3.7927%	4.8531%	3.9766%
80	10,993,159	513,294	602,498.1	492,959.0	0.85	1.04	4.6692%	5.4807%	4.4842%
81	9,720,977	432,863	605,993.7	491,837.4	0.71	0.88	4.4529%	6.2339%	5.0595%
82	8,533,206	527,446	603,975.5	487,341.5	0.87	1.08	6.1811%	7.0779%	5.7111%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 2A

Calendar Years 2015 - 2019

Mortality Experience of Non Disabled Annuitants and Survivors

Males

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	7,782,539	506,261	571,045.3	501,424.9	0.89	1.01	6.5051%	7.3375%	6.4429%
84	7,111,457	477,877	589,751.0	516,176.4	0.81	0.93	6.7198%	8.2930%	7.2584%
85	6,316,143	460,995	581,425.5	515,684.7	0.79	0.89	7.2987%	9.2054%	8.1646%
86	5,590,325	530,816	570,552.6	512,013.9	0.93	1.04	9.4953%	10.2061%	9.1589%
87	4,944,043	519,238	568,098.3	506,392.2	0.91	1.03	10.5023%	11.4906%	10.2425%
88	4,137,900	492,033	534,845.5	472,618.2	0.92	1.04	11.8909%	12.9255%	11.4217%
89	3,435,773	446,824	490,774.7	436,079.0	0.91	1.02	13.0050%	14.2843%	12.6923%
90	2,914,527	465,969	466,249.9	409,725.6	1.00	1.14	15.9878%	15.9974%	14.0580%
91	2,366,812	396,899	412,405.2	366,847.6	0.96	1.08	16.7693%	17.4245%	15.4997%
92	1,785,890	409,037	342,869.4	303,769.4	1.19	1.35	22.9038%	19.1988%	17.0094%
93	1,353,009	304,349	301,308.5	251,297.7	1.01	1.21	22.4942%	22.2695%	18.5732%
94	982,672	204,069	234,786.5	198,396.1	0.87	1.03	20.7667%	23.8927%	20.1895%
95	710,314	189,886	184,012.7	155,228.0	1.03	1.22	26.7327%	25.9058%	21.8535%
96	451,738	137,816	124,207.8	106,938.4	1.11	1.29	30.5078%	27.4955%	23.6726%
97	282,802	80,859	82,125.6	72,243.4	0.98	1.12	28.5919%	29.0399%	25.5456%
98	162,189	68,690	50,325.5	44,580.9	1.36	1.54	42.3517%	31.0289%	27.4869%
99	88,685	28,437	28,819.5	26,140.0	0.99	1.09	32.0653%	32.4963%	29.4750%
100	57,414	10,992	19,468.1	18,083.8	0.56	0.61	19.1456%	33.9084%	31.4973%
101	51,131	15,308	18,337.1	17,145.6	0.83	0.89	29.9388%	35.8628%	33.5326%
102	32,436	21,748	12,055.9	11,533.6	1.80	1.89	67.0507%	37.1685%	35.5584%
103	12,038	2,022	4,611.2	4,520.1	0.44	0.45	16.7937%	38.3040%	37.5473%
104	5,884	3,012	2,306.4	2,323.7	1.31	1.30	51.1956%	39.2003%	39.4941%
105	2,431	0	967.3	1,006.0	0.00	0.00	0.0000%	39.7886%	41.3833%
106	2,431	0	972.4	1,050.4	0.00	0.00	0.0000%	40.0000%	43.2079%
107	2,431	2,431	972.4	1,092.6	2.50	2.22	100.0000%	40.0000%	44.9456%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	46.6067%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	48.1681%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.4278%
111	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.5418%
112	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.6560%
113	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.7705%
114	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.8851%
115	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
116	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
117	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
118	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
119	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
120	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	675,168,296	15,470,930	17,196,000.9	14,890,758.2	0.90	1.04	2.2914%	2.5469%	2.2055%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 2A

Calendar Years 2015 - 2019

Mortality Experience of Non Disabled Annuitants and Survivors

Females

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
30	24,756	0	5.3	4.9	0.00	0.00	0.0000%	0.0216%	0.019
31	25,780	0	6.7	5.8	0.00	0.00	0.0000%	0.0261%	0.022
32	28,795	0	8.6	6.8	0.00	0.00	0.0000%	0.0298%	0.023
33	40,131	0	13.2	10.4	0.00	0.00	0.0000%	0.0329%	0.025
34	47,877	122	17.0	13.4	7.18	9.15	0.2556%	0.0356%	0.027
35	51,901	0	19.8	15.5	0.00	0.00	0.0000%	0.0381%	0.029
36	64,586	124	26.1	21.2	4.76	5.87	0.1924%	0.0404%	0.032
37	74,301	243	31.7	25.5	7.66	9.51	0.3265%	0.0426%	0.034
38	92,068	34	41.5	33.9	0.82	1.01	0.0372%	0.0451%	0.036
39	101,708	41	48.7	39.7	0.84	1.03	0.0400%	0.0479%	0.039
40	118,025	220	61.6	49.8	3.56	4.41	0.1860%	0.0522%	0.042
41	123,736	0	70.8	54.7	0.00	0.00	0.0000%	0.0572%	0.044
42	142,007	52	89.4	67.0	0.58	0.77	0.0364%	0.0630%	0.047
43	162,895	97	112.8	81.7	0.86	1.19	0.0598%	0.0693%	0.050
44	209,444	1,349	159.3	113.6	8.47	11.88	0.6442%	0.0761%	0.054
45	264,268	86	215.1	154.6	0.40	0.55	0.0324%	0.0814%	0.058
46	359,736	565	312.2	226.7	1.81	2.49	0.1571%	0.0868%	0.063
47	468,186	664	431.7	317.9	1.54	2.09	0.1418%	0.0922%	0.067
48	558,947	1,496	557.4	414.3	2.68	3.61	0.2676%	0.0997%	0.074
49	675,842	245	728.5	1,460.0	0.34	0.17	0.0363%	0.1078%	0.216
50	835,150	840	993.4	1,920.9	0.85	0.44	0.1005%	0.1189%	0.230
51	1,198,609	2,787	1,607.8	2,958.0	1.73	0.94	0.2325%	0.1341%	0.246
52	1,619,922	6,212	2,465.8	4,279.8	2.52	1.45	0.3835%	0.1522%	0.264
53	2,175,170	7,961	3,770.8	6,129.7	2.11	1.30	0.3660%	0.1734%	0.281
54	2,998,064	14,589	5,944.0	8,999.9	2.45	1.62	0.4866%	0.1983%	0.300
55	4,165,874	7,788	9,638.9	13,282.1	0.81	0.59	0.1870%	0.2314%	0.318
56	5,465,759	10,306	14,974.0	18,492.7	0.69	0.56	0.1886%	0.2740%	0.338
57	6,755,511	24,177	21,254.4	24,132.9	1.14	1.00	0.3579%	0.3146%	0.357
58	7,979,335	26,155	28,317.0	30,193.0	0.92	0.87	0.3278%	0.3549%	0.378
59	9,808,898	46,109	39,406.0	39,401.2	1.17	1.17	0.4701%	0.4017%	0.401
60	13,373,326	50,189	61,153.6	57,383.9	0.82	0.87	0.3753%	0.4573%	0.429
61	17,538,614	85,139	92,242.7	80,766.2	0.92	1.05	0.4854%	0.5259%	0.460
62	19,957,236	90,095	120,182.3	99,412.3	0.75	0.91	0.4514%	0.6022%	0.498
63	22,351,024	99,495	154,634.7	120,732.6	0.64	0.82	0.4451%	0.6918%	0.540
64	23,491,319	134,939	164,842.2	138,560.5	0.82	0.97	0.5744%	0.7017%	0.589
65	23,603,044	170,053	186,514.4	152,696.0	0.91	1.11	0.7205%	0.7902%	0.646
66	23,525,124	202,028	209,801.6	167,663.4	0.96	1.20	0.8588%	0.8918%	0.712
67	22,978,117	189,645	227,540.8	181,510.6	0.83	1.04	0.8253%	0.9902%	0.789
68	22,220,739	204,962	243,233.5	195,421.5	0.84	1.05	0.9224%	1.0946%	0.879
69	20,257,306	244,915	245,078.2	198,964.0	1.00	1.23	1.2090%	1.2098%	0.982
70	18,586,310	179,947	253,340.5	204,617.1	0.71	0.88	0.9682%	1.3630%	1.100
71	16,524,650	207,155	244,976.7	204,349.7	0.85	1.01	1.2536%	1.4825%	1.236
72	15,062,102	212,810	248,365.5	209,542.9	0.86	1.02	1.4129%	1.6489%	1.391
73	12,793,282	232,539	229,810.8	200,405.5	1.01	1.16	1.8177%	1.7963%	1.566
74	11,950,700	200,473	237,927.8	210,929.7	0.84	0.95	1.6775%	1.9909%	1.765
75	11,031,558	242,154	237,635.8	219,320.1	1.02	1.10	2.1951%	2.1541%	1.988
76	10,348,745	234,569	245,611.5	231,936.0	0.96	1.01	2.2666%	2.3733%	2.241
77	9,183,582	212,106	244,938.8	232,148.5	0.87	0.91	2.3096%	2.6671%	2.527
78	8,456,740	262,532	248,634.0	241,245.5	1.06	1.09	3.1044%	2.9401%	2.852
79	7,534,516	226,735	244,564.7	242,882.5	0.93	0.93	3.0093%	3.2459%	3.223
80	6,976,573	265,609	250,313.1	254,345.4	1.06	1.04	3.8072%	3.5879%	3.645
81	6,306,842	260,297	278,284.9	260,350.3	0.94	1.00	4.1272%	4.4124%	4.128
82	5,732,735	279,099	280,420.0	268,097.8	1.00	1.04	4.8685%	4.8916%	4.676

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 2A

Calendar Years 2015 - 2019

Mortality Experience of Non Disabled Annuitants and Survivors

Females

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	5,242,902	299,497	284,759.6	278,070.8	1.05	1.08	5.7124%	5.4313%	5.3038%
84	4,883,616	274,683	294,996.9	293,869.6	0.93	0.93	5.6246%	6.0405%	6.0175%
85	4,424,143	278,233	303,777.7	302,180.1	0.92	0.92	6.2890%	6.8664%	6.8303%
86	4,085,686	336,202	319,241.7	316,619.7	1.05	1.06	8.2288%	7.8137%	7.7495%
87	3,758,765	325,134	334,214.3	329,874.0	0.97	0.99	8.6500%	8.8916%	8.7761%
88	3,504,841	318,727	347,109.9	347,303.2	0.92	0.92	9.0939%	9.9037%	9.9092%
89	3,173,395	367,816	356,070.4	353,476.1	1.03	1.04	11.5906%	11.2205%	11.1387%
90	2,779,357	367,333	344,646.5	345,827.3	1.07	1.06	13.2165%	12.4002%	12.4427%
91	2,349,313	312,139	319,907.4	324,182.8	0.98	0.96	13.2864%	13.6171%	13.7990%
92	1,928,317	294,222	286,211.7	293,312.1	1.03	1.00	15.2580%	14.8426%	15.2108%
93	1,566,148	269,899	256,446.9	261,218.5	1.05	1.03	17.2333%	16.3744%	16.6790%
94	1,249,023	257,351	219,358.8	227,476.9	1.17	1.13	20.6041%	17.5624%	18.2124%
95	940,565	203,815	175,767.9	186,868.2	1.16	1.09	21.6694%	18.6875%	19.8676%
96	693,725	143,260	136,884.5	150,015.4	1.05	0.95	20.6509%	19.7318%	21.6246%
97	530,766	144,348	111,978.8	124,617.7	1.29	1.16	27.1961%	21.0976%	23.4788%
98	364,976	108,448	80,116.1	92,808.8	1.35	1.17	29.7137%	21.9510%	25.4287%
99	236,606	70,080	53,662.9	64,986.5	1.31	1.08	29.6188%	22.6803%	27.4662%
100	151,617	57,623	35,290.7	44,837.1	1.63	1.29	38.0057%	23.2763%	29.5727%
101	89,572	33,493	21,930.3	28,387.3	1.53	1.18	37.3923%	24.4834%	31.6921%
102	51,455	17,928	13,095.1	17,400.3	1.37	1.03	34.8425%	25.4498%	33.8167%
103	35,146	12,509	9,350.5	12,623.4	1.34	0.99	35.5913%	26.6044%	35.9167%
104	19,404	7,203	5,414.8	7,371.3	1.33	0.98	37.1191%	27.9055%	37.9883%
105	12,702	5,120	3,723.2	5,082.8	1.38	1.01	40.3056%	29.3116%	40.0158%
106	6,869	4,196	2,114.5	2,882.5	1.98	1.46	61.0805%	30.7811%	41.9609%
107	2,273	714	733.4	996.1	0.97	0.72	31.4062%	32.2725%	43.8292%
108	2,295	736	774.3	1,046.7	0.95	0.70	32.0626%	33.7441%	45.6174%
109	485	0	170.6	229.5	0.00	0.00	0.0000%	35.1544%	47.2956%
110	485	485	177.0	237.2	2.74	2.05	100.0000%	36.4617%	48.8812%
111	0	0	0.0	0.0	0.00	0.00	0.0000%	36.4617%	49.7555%
112	0	0	0.0	0.0	0.00	0.00	0.0000%	37.6246%	49.8402%
113	0	0	0.0	0.0	0.00	0.00	0.0000%	38.6015%	49.9151%
114	0	0	0.0	0.0	0.00	0.00	0.0000%	39.3507%	50.0000%
115	0	0	0.0	0.0	0.00	0.00	0.0000%	39.8308%	50.0000%
116	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
117	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
118	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
119	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	100.0000%
120	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	438,634,938	9,150,940	9,399,324.5	8,940,009.0	0.97	1.02	2.0862%	2.1429%	2.0381%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 2A
Mortality Experience of Non Disabled Annuitants and Survivors
Calendar Years 2015 - 2019
Males

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	47,912	0	12.4	16.8	0.00	0.00	0.0000%	0.0258%	0.0351%
25-29	76,632	0	27.3	28.9	0.00	0.00	0.0000%	0.0357%	0.0377%
30-34	160,918	773	88.1	83.5	8.77	9.26	0.4803%	0.0547%	0.0519%
35-39	409,115	1,436	343.7	270.9	4.18	5.30	0.3511%	0.0840%	0.0662%
40-44	952,512	11,326	1,018.4	798.1	11.12	14.19	1.1891%	0.1069%	0.0838%
45-49	12,535,628	21,103	17,887.4	14,859.8	1.18	1.42	0.1683%	0.1427%	0.1185%
50-54	37,173,002	137,375	73,284.8	125,087.1	1.87	1.10	0.3696%	0.1971%	0.3365%
55-59	52,839,625	276,125	195,485.7	272,236.6	1.41	1.01	0.5226%	0.3700%	0.5152%
60-64	107,269,469	771,587	779,989.0	809,333.3	0.99	0.95	0.7193%	0.7271%	0.7545%
65-69	164,375,518	1,894,623	2,159,947.4	1,814,257.1	0.88	1.04	1.1526%	1.3140%	1.1037%
70-74	139,541,027	2,568,749	2,960,083.8	2,456,246.0	0.87	1.05	1.8409%	2.1213%	1.7602%
75-79	79,956,583	2,538,664	3,002,071.3	2,473,089.5	0.85	1.03	3.1751%	3.7546%	3.0930%
80-84	44,141,338	2,457,741	2,973,263.6	2,489,739.4	0.83	0.99	5.5679%	6.7358%	5.6404%
85-89	24,424,183	2,449,906	2,745,696.7	2,442,788.0	0.89	1.00	10.0307%	11.2417%	10.0015%
90-94	9,402,910	1,780,322	1,757,619.5	1,530,036.3	1.01	1.16	18.9337%	18.6923%	16.2719%
95-99	1,695,729	505,688	469,491.1	405,130.8	1.08	1.25	29.8213%	27.6867%	23.8913%
100 and over	166,196	55,514	59,690.8	56,755.9	0.93	0.98	33.4025%	35.9159%	34.1500%
<i>Total</i>	<i>675,168,296</i>	<i>15,470,930</i>	<i>17,196,000.9</i>	<i>14,890,758.2</i>	<i>0.90</i>	<i>1.04</i>	<i>2.2914%</i>	<i>2.5469%</i>	<i>2.2055%</i>

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 2A

Calendar Years 2015 - 2019

Mortality Experience of Non Disabled Annuitants and Survivors

Females

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	59,521	0	8.1	6.9	0.00	0.00	0.0000%	0.0136%	0.0116%
25-29	69,504	0	12.4	10.6	0.00	0.00	0.0000%	0.0179%	0.0153%
30-34	167,339	122	50.9	41.2	2.40	2.97	0.0731%	0.0304%	0.0246%
35-39	384,564	442	167.8	135.7	2.63	3.25	0.1149%	0.0436%	0.0353%
40-44	756,108	1,718	493.9	366.7	3.48	4.68	0.2272%	0.0653%	0.0485%
45-49	2,326,978	3,056	2,244.9	2,573.5	1.36	1.19	0.1313%	0.0965%	0.1106%
50-54	8,826,915	32,389	14,781.7	24,288.3	2.19	1.33	0.3669%	0.1675%	0.2752%
55-59	34,175,376	114,535	113,590.3	125,501.9	1.01	0.91	0.3351%	0.3324%	0.3672%
60-64	96,711,520	459,858	593,055.5	496,855.4	0.78	0.93	0.4755%	0.6132%	0.5137%
65-69	112,584,330	1,011,603	1,112,168.5	896,255.6	0.91	1.13	0.8985%	0.9879%	0.7961%
70-74	74,917,044	1,032,924	1,214,421.2	1,029,844.9	0.85	1.00	1.3788%	1.6210%	1.3746%
75-79	46,555,142	1,178,095	1,221,384.9	1,167,532.6	0.96	1.01	2.5305%	2.6235%	2.5078%
80-84	29,142,667	1,379,184	1,388,774.5	1,354,734.0	0.99	1.02	4.7325%	4.7654%	4.6486%
85-89	18,946,830	1,626,113	1,660,414.1	1,649,453.1	0.98	0.99	8.5825%	8.7635%	8.7057%
90-94	9,872,158	1,500,944	1,426,571.3	1,452,017.7	1.05	1.03	15.2038%	14.4505%	14.7082%
95-99	2,766,638	669,950	558,410.1	619,296.6	1.20	1.08	24.2153%	20.1837%	22.3844%
100 and over	372,303	140,006	92,774.3	121,094.3	1.51	1.16	37.6054%	24.9190%	32.5257%
<i>Total</i>	<i>438,634,938</i>	<i>9,150,940</i>	<i>9,399,324.5</i>	<i>8,940,009.0</i>	<i>0.97</i>	<i>1.02</i>	<i>2.0862%</i>	<i>2.1429%</i>	<i>2.0381%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 2B

Mortality Experience of Non Disabled Annuitants and Survivors

Males

Year	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	124,261,873	2,783,174	3,046,094.5	2,643,183.3	0.91	1.05	2.2398%	2.4514%	2.1271%
2016	129,161,955	2,880,538	3,232,400.2	2,801,384.6	0.89	1.03	2.2302%	2.5026%	2.1689%
2017	135,635,479	2,958,233	3,439,703.2	2,978,595.3	0.86	0.99	2.1810%	2.5360%	2.1960%
2018	140,809,756	3,397,242	3,638,959.5	3,148,503.7	0.93	1.08	2.4126%	2.5843%	2.2360%
2019	145,299,233	3,451,744	3,838,843.5	3,319,091.2	0.90	1.04	2.3756%	2.6420%	2.2843%
Total	675,168,296	15,470,930	17,196,000.9	14,890,758.2	0.90	1.04	2.2914%	2.5469%	2.2055%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 2B

Mortality Experience of Non Disabled Annuitants and Survivors

Females

Year	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	79,625,301	1,580,111	1,664,740.9	1,587,146.4	0.95	1.00	1.9844%	2.0907%	1.9933%
2016	84,013,742	1,766,534	1,766,176.4	1,680,257.7	1.00	1.05	2.1027%	2.1022%	2.0000%
2017	88,060,638	1,787,245	1,872,825.4	1,780,463.1	0.95	1.00	2.0296%	2.1267%	2.0219%
2018	91,741,427	1,994,574	1,990,906.6	1,892,222.3	1.00	1.05	2.1741%	2.1701%	2.0626%
2019	95,193,831	2,022,475	2,104,675.1	1,999,919.5	0.96	1.01	2.1246%	2.2109%	2.1009%
<i>Total</i>	<i>438,634,938</i>	<i>9,150,940</i>	<i>9,399,324.5</i>	<i>8,940,009.0</i>	<i>0.97</i>	<i>1.02</i>	<i>2.0862%</i>	<i>2.1429%</i>	<i>2.0381%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 3A **Calendar Years 2015 - 2019**
Mortality Experience of Disabled Annuitants **Males**

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
30	5,120	0	104.0	25.5	0.00	0.00	0.0000%	2.0316%	0.4987%
31	9,328	0	189.5	49.0	0.00	0.00	0.0000%	2.0316%	0.5258%
32	10,768	0	218.8	59.6	0.00	0.00	0.0000%	2.0316%	0.5538%
33	16,303	0	331.2	94.5	0.00	0.00	0.0000%	2.0316%	0.5798%
34	21,829	0	443.5	132.5	0.00	0.00	0.0000%	2.0316%	0.6070%
35	38,607	0	784.3	245.1	0.00	0.00	0.0000%	2.0316%	0.6347%
36	50,834	2,023	1,032.7	337.6	1.96	5.99	3.9790%	2.0316%	0.6641%
37	51,790	0	1,052.2	359.8	0.00	0.00	0.0000%	2.0316%	0.6947%
38	57,965	1,332	1,153.0	422.0	1.16	3.16	2.2979%	1.9891%	0.7280%
39	65,939	2,195	1,284.2	504.5	1.71	4.35	3.3282%	1.9476%	0.7651%
40	70,704	0	1,348.1	571.1	0.00	0.00	0.0000%	1.9067%	0.8077%
41	92,497	2,646	1,726.7	792.4	1.53	3.34	2.8605%	1.8668%	0.8567%
42	119,889	0	2,191.1	1,097.7	0.00	0.00	0.0000%	1.8276%	0.9156%
43	152,322	927	2,725.5	1,498.1	0.34	0.62	0.6089%	1.7893%	0.9835%
44	210,981	1,332	3,695.6	2,244.1	0.36	0.59	0.6313%	1.7516%	1.0637%
45	246,298	2,664	4,223.6	2,848.7	0.63	0.94	1.0816%	1.7148%	1.1566%
46	291,918	7,343	5,177.3	3,684.8	1.42	1.99	2.5154%	1.7735%	1.2623%
47	338,809	6,339	6,197.4	4,674.5	1.02	1.36	1.8711%	1.8292%	1.3797%
48	395,880	5,559	7,449.7	5,978.9	0.75	0.93	1.4041%	1.8818%	1.5103%
49	458,055	0	8,847.4	7,424.8	0.00	0.00	0.0000%	1.9315%	1.6210%
50	543,248	4,706	10,748.8	9,436.3	0.44	0.50	0.8663%	1.9786%	1.7370%
51	638,814	19,320	12,924.4	11,856.7	1.49	1.63	3.0244%	2.0232%	1.8561%
52	686,093	3,813	14,168.2	13,554.3	0.27	0.28	0.5557%	2.0651%	1.9756%
53	788,496	7,057	16,951.1	16,514.4	0.42	0.43	0.8950%	2.1498%	2.0944%
54	839,050	23,933	18,747.7	18,534.0	1.28	1.29	2.8524%	2.2344%	2.2089%
55	942,205	26,447	22,321.1	21,823.9	1.18	1.21	2.8070%	2.3690%	2.3163%
56	1,008,971	26,175	25,308.3	24,390.7	1.03	1.07	2.5942%	2.5083%	2.4174%
57	1,040,558	19,183	27,604.0	26,136.1	0.69	0.73	1.8435%	2.6528%	2.5117%
58	1,086,204	29,538	30,448.9	28,248.5	0.97	1.05	2.7194%	2.8032%	2.6007%
59	1,238,386	45,774	35,892.8	33,261.2	1.28	1.38	3.6962%	2.8984%	2.6859%
60	1,223,994	25,729	36,674.6	33,915.4	0.70	0.76	2.1020%	2.9963%	2.7709%
61	1,276,937	35,269	40,416.7	36,520.8	0.87	0.97	2.7620%	3.1651%	2.8600%
62	1,312,525	30,033	42,982.7	38,760.7	0.70	0.77	2.2882%	3.2748%	2.9531%
63	1,308,015	35,873	45,317.2	39,884.2	0.79	0.90	2.7426%	3.4646%	3.0492%
64	1,275,440	39,649	45,822.7	40,214.7	0.87	0.99	3.1086%	3.5927%	3.1530%
65	1,281,487	43,670	47,819.5	41,842.9	0.91	1.04	3.4078%	3.7316%	3.2652%
66	1,218,326	34,639	48,328.8	41,283.7	0.72	0.84	2.8431%	3.9668%	3.3886%
67	1,114,452	48,033	46,101.7	39,301.1	1.04	1.22	4.3100%	4.1367%	3.5265%
68	1,042,632	35,203	44,129.4	38,377.2	0.80	0.92	3.3763%	4.2325%	3.6808%
69	897,750	28,982	39,802.2	34,626.7	0.73	0.84	3.2283%	4.4336%	3.8571%
70	772,390	24,338	35,193.0	31,341.3	0.69	0.78	3.1510%	4.5564%	4.0577%
71	618,608	45,765	29,653.5	26,510.5	1.54	1.73	7.3981%	4.7936%	4.2855%
72	531,611	34,455	26,862.5	24,149.9	1.28	1.43	6.4812%	5.0530%	4.5428%
73	411,168	25,773	21,940.0	19,876.7	1.17	1.30	6.2682%	5.3360%	4.8342%
74	379,036	17,572	21,390.1	19,560.7	0.82	0.90	4.6359%	5.6433%	5.1606%
75	318,989	22,705	19,469.6	17,630.2	1.17	1.29	7.1179%	6.1035%	5.5269%
76	266,481	16,273	17,232.9	15,819.7	0.94	1.03	6.1068%	6.4668%	5.9365%
77	204,804	12,683	14,337.9	13,094.6	0.88	0.97	6.1929%	7.0008%	6.3937%
78	168,668	14,970	12,780.8	11,641.5	1.17	1.29	8.8752%	7.5775%	6.9020%
79	134,115	12,505	10,992.2	10,011.7	1.14	1.25	9.3240%	8.1961%	7.4650%
80	116,055	11,436	10,278.0	9,380.3	1.11	1.22	9.8538%	8.8561%	8.0826%
81	101,664	12,249	9,715.4	8,904.4	1.26	1.38	12.0486%	9.5564%	8.7587%
82	93,263	3,980	9,602.3	8,850.8	0.41	0.45	4.2671%	10.2960%	9.4901%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 3A
Mortality Experience of Disabled Annuitants Calendar Years 2015 - 2019

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	83,095	9,127	9,009.3	8,540.6	1.01	1.07	10.9835%	10.8422%	10.2782%
84	66,860	5,743	7,783.8	7,437.6	0.74	0.77	8.5891%	11.6418%	11.1241%
85	64,380	9,551	7,866.1	7,744.2	1.21	1.23	14.8350%	12.2182%	12.0289%
86	56,186	8,685	7,193.2	7,307.0	1.21	1.19	15.4582%	12.8024%	13.0049%
87	45,411	7,756	6,212.4	6,459.6	1.25	1.20	17.0788%	13.6805%	14.2248%
88	43,113	11,832	6,293.7	6,713.9	1.88	1.76	27.4438%	14.5982%	15.5729%
89	33,850	8,057	5,156.2	5,736.9	1.56	1.40	23.8011%	15.2325%	16.9480%
90	23,446	4,926	3,953.0	4,298.3	1.25	1.15	21.0093%	16.8602%	18.3332%
91	16,178	2,882	2,971.1	3,190.2	0.97	0.90	17.8166%	18.3643%	19.7187%
92	12,072	1,067	2,455.0	2,549.4	0.43	0.42	8.8361%	20.3361%	21.1183%
93	10,699	4,415	2,347.0	2,412.5	1.88	1.83	41.2648%	21.9375%	22.5495%
94	4,687	1,872	1,103.1	1,131.6	1.70	1.65	39.9428%	23.5364%	24.1465%
95	3,124	1,018	801.2	806.7	1.27	1.26	32.6046%	25.6478%	25.8237%
96	1,726	789	469.8	476.6	1.68	1.66	45.7218%	27.2216%	27.6158%
97	0	0	0.0	0.0	0.00	0.00	0.0000%	28.7507%	29.5117%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	30.8740%	31.4973%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	32.3342%	33.5326%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	33.7392%	35.5584%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	35.8628%	37.5473%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	37.1685%	39.4941%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	38.3040%	41.3833%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	39.2003%	43.2079%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	39.7886%	44.9456%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	46.6067%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	48.1681%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.4278%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.5418%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.6560%
111	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.7705%
112	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	49.8851%
113	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
114	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
115	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
116	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
117	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
118	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	100.0000%
119	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	100.0000%
120	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	28,065,180	927,806	1,006,035.8	903,167.7	0.92	1.03	3.3059%	3.5846%	3.2181%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 3A

Calendar Years 2015 - 2019

Mortality Experience of Disabled Annuitants

Females

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recc
30	6,624	0	41.6	25.2	0.00	0.00	0.0000%	0.6280%	
31	9,539	0	62.0	39.7	0.00	0.00	0.0000%	0.6499%	
32	13,261	0	86.2	59.8	0.00	0.00	0.0000%	0.6499%	
33	19,772	0	126.3	96.3	0.00	0.00	0.0000%	0.6388%	
34	22,727	842	142.7	119.0	5.90	7.08	3.7046%	0.6280%	
35	32,177	0	198.6	180.5	0.00	0.00	0.0000%	0.6173%	
36	41,034	0	249.0	245.9	0.00	0.00	0.0000%	0.6068%	
37	45,099	1,528	269.0	288.4	5.68	5.30	3.3877%	0.5965%	
38	51,627	0	302.6	352.0	0.00	0.00	0.0000%	0.5862%	
39	67,740	1,604	390.3	492.2	4.11	3.26	2.3679%	0.5762%	
40	67,878	2,183	391.1	525.8	5.58	4.15	3.2163%	0.5762%	
41	80,852	1,118	465.9	669.2	2.40	1.67	1.3831%	0.5762%	
42	102,078	3,685	588.2	905.6	6.27	4.07	3.6104%	0.5762%	
43	125,541	945	723.4	1,197.7	1.31	0.79	0.7528%	0.5762%	
44	154,203	1,003	888.6	1,586.8	1.13	0.63	0.6507%	0.5762%	
45	194,716	0	1,102.7	2,170.0	0.00	0.00	0.0000%	0.5663%	
46	252,014	2,104	1,541.0	3,053.5	1.37	0.69	0.8351%	0.6115%	
47	299,000	7,206	1,967.0	3,951.4	3.66	1.82	2.4101%	0.6579%	
48	337,290	2,721	2,421.1	4,867.5	1.12	0.56	0.8066%	0.7178%	
49	354,027	806	2,764.6	5,364.6	0.29	0.15	0.2276%	0.7809%	
50	403,124	3,333	3,474.1	6,418.1	0.96	0.52	0.8269%	0.8618%	
51	443,501	13,382	4,206.7	7,419.3	3.18	1.80	3.0173%	0.9485%	
52	526,232	5,601	5,572.0	9,224.7	1.01	0.61	1.0643%	1.0588%	
53	628,031	7,213	7,398.7	11,483.1	0.97	0.63	1.1485%	1.1781%	
54	717,382	7,560	9,371.4	13,594.2	0.81	0.56	1.0539%	1.3063%	
55	823,782	17,763	11,888.9	16,065.7	1.49	1.11	2.1563%	1.4432%	
56	982,784	21,122	15,613.3	19,581.2	1.35	1.08	2.1492%	1.5887%	
57	1,014,871	25,816	17,385.2	20,531.0	1.48	1.26	2.5438%	1.7130%	
58	1,100,653	28,678	19,921.6	22,520.5	1.44	1.27	2.6055%	1.8100%	
59	1,157,150	21,478	22,069.1	23,871.3	0.97	0.90	1.8561%	1.9072%	
60	1,232,204	33,289	24,712.5	25,634.6	1.35	1.30	2.7016%	2.0056%	
61	1,258,389	31,310	26,504.3	26,452.5	1.18	1.18	2.4881%	2.1062%	
62	1,331,044	25,964	29,432.8	28,368.6	0.88	0.92	1.9507%	2.2113%	
63	1,320,355	25,678	30,668.1	28,661.7	0.84	0.90	1.9448%	2.3227%	
64	1,311,167	34,950	32,027.6	29,178.4	1.09	1.20	2.6656%	2.4427%	
65	1,275,531	33,892	32,827.5	29,305.6	1.03	1.16	2.6571%	2.5736%	
66	1,216,831	33,981	33,069.7	29,085.3	1.03	1.17	2.7926%	2.7177%	
67	1,096,288	37,977	31,536.4	27,462.7	1.20	1.38	3.4642%	2.8767%	
68	1,010,553	33,083	30,841.7	26,723.2	1.07	1.24	3.2737%	3.0520%	
69	898,378	23,594	29,151.1	25,236.4	0.81	0.93	2.6263%	3.2449%	
70	798,871	30,738	27,609.9	23,968.9	1.11	1.28	3.8477%	3.4561%	
71	674,316	19,342	24,434.7	21,707.4	0.79	0.89	2.8684%	3.6236%	
72	575,782	24,044	22,273.6	19,973.1	1.08	1.20	4.1759%	3.8684%	
73	457,552	16,288	18,584.5	17,168.0	0.88	0.95	3.5598%	4.0617%	
74	373,575	21,686	16,209.9	15,206.0	1.34	1.43	5.8049%	4.3391%	
75	316,273	16,738	14,410.4	14,003.0	1.16	1.20	5.2923%	4.5563%	
76	264,252	14,588	12,858.1	12,754.2	1.13	1.14	5.5203%	4.8658%	
77	240,680	11,856	12,718.1	12,685.6	0.93	0.93	4.9260%	5.2842%	
78	204,609	9,072	11,538.3	11,791.9	0.79	0.77	4.4336%	5.6392%	
79	194,790	7,168	11,718.9	12,282.7	0.61	0.58	3.6799%	6.0162%	
80	179,599	12,580	11,525.2	12,397.0	1.09	1.01	7.0048%	6.4172%	
81	149,475	13,268	10,232.0	11,295.4	1.30	1.17	8.8764%	6.8453%	
82	123,686	5,083	9,033.3	10,229.5	0.56	0.50	4.1099%	7.3035%	

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 3A
Mortality Experience of Disabled Annuitants **Calendar Years 2015 - 2019**
Females

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	115,604	12,260	9,011.4	10,461.0	1.36	1.17	10.6050%	7.7951%	9.0490%
84	88,505	5,385	7,366.8	8,725.6	0.73	0.62	6.0841%	8.3236%	9.8588%
85	72,278	7,520	6,538.1	7,723.9	1.15	0.97	10.4043%	9.0458%	10.6865%
86	67,490	4,149	6,637.7	7,777.3	0.63	0.53	6.1477%	9.8351%	11.5236%
87	59,782	8,397	6,394.9	7,397.4	1.31	1.14	14.0466%	10.6970%	12.3739%
88	42,866	8,545	4,903.8	5,680.1	1.74	1.50	19.9339%	11.4398%	13.2507%
89	34,842	6,557	4,336.0	4,937.9	1.51	1.33	18.8202%	12.4450%	14.1725%
90	23,884	2,159	3,178.4	3,618.9	0.68	0.60	9.0413%	13.3075%	15.1519%
91	17,665	4,737	2,512.8	2,864.7	1.88	1.65	26.8125%	14.2244%	16.2163%
92	12,542	2,271	1,905.9	2,180.2	1.19	1.04	18.1098%	15.1961%	17.3829%
93	14,983	1,234	2,468.2	2,797.3	0.50	0.44	8.2355%	16.4730%	18.6700%
94	11,820	2,170	2,088.4	2,380.3	1.04	0.91	18.3603%	17.6683%	20.1380%
95	10,446	2,096	1,963.9	2,275.8	1.07	0.92	20.0689%	18.8001%	21.7857%
96	8,299	2,543	1,647.5	1,955.0	1.54	1.30	30.6412%	19.8507%	23.5557%
97	4,059	457	858.9	1,033.0	0.53	0.44	11.2507%	21.1610%	25.4501%
98	2,658	293	585.1	730.0	0.50	0.40	11.0402%	22.0171%	27.4662%
99	2,996	0	681.5	886.0	0.00	0.00	0.0000%	22.7484%	29.5727%
100	2,508	1,249	585.5	794.8	2.13	1.57	49.7883%	23.3462%	31.6921%
101	1,259	0	308.3	425.8	0.00	0.00	0.0000%	24.4834%	33.8167%
102	1,259	0	320.5	452.3	0.00	0.00	0.0000%	25.4498%	35.9167%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	26.6044%	37.9883%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	27.9055%	40.0158%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	29.3116%	41.9609%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	30.7811%	43.8292%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	32.2725%	45.6174%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	33.7441%	47.2956%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	35.1544%	48.8812%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	36.4617%	49.7555%
111	0	0	0.0	0.0	0.00	0.00	0.0000%	37.6246%	49.8402%
112	0	0	0.0	0.0	0.00	0.00	0.0000%	38.6015%	49.9151%
113	0	0	0.0	0.0	0.00	0.00	0.0000%	39.3507%	50.0000%
114	0	0	0.0	0.0	0.00	0.00	0.0000%	39.8308%	50.0000%
115	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
116	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
117	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	50.0000%
118	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	100.0000%
119	0	0	0.0	0.0	0.00	0.00	0.0000%	40.0000%	100.0000%
120	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	27,182,806	765,885	699,886.5	723,595.1	1.09	1.06	2.8175%	2.5747%	2.6620%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 3A **Calendar Years 2015 - 2019**
Mortality Experience of Disabled Annuitants **Males**

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
25-29	14,087	0	286.2	61.5	0.00	0.00	0.0000%	2.0316%	0.4367%
30-34	63,348	0	1,287.0	361.2	0.00	0.00	0.0000%	2.0316%	0.5702%
35-39	265,135	5,549	5,306.5	1,868.9	1.05	2.97	2.0930%	2.0014%	0.7049%
40-44	646,392	4,905	11,687.1	6,203.5	0.42	0.79	0.7589%	1.8080%	0.9597%
45-49	1,730,960	21,905	31,895.3	24,611.7	0.69	0.89	1.2655%	1.8426%	1.4219%
50-54	3,495,700	58,829	73,540.1	69,895.7	0.80	0.84	1.6829%	2.1037%	1.9995%
55-59	5,316,323	147,117	141,575.2	133,860.3	1.04	1.10	2.7673%	2.6630%	2.5179%
60-64	6,396,911	166,553	211,213.9	189,295.8	0.79	0.88	2.6036%	3.3018%	2.9592%
65-69	5,554,647	190,526	226,181.7	195,431.5	0.84	0.97	3.4300%	4.0719%	3.5183%
70-74	2,712,813	147,902	135,039.1	121,439.2	1.10	1.22	5.4520%	4.9778%	4.4765%
75-79	1,093,056	79,136	74,813.4	68,197.7	1.06	1.16	7.2399%	6.8444%	6.2392%
80-84	460,938	42,534	46,388.8	43,113.7	0.92	0.99	9.2277%	10.0640%	9.3535%
85-89	242,940	45,880	32,721.6	33,961.5	1.40	1.35	18.8854%	13.4690%	13.9794%
90-94	67,081	15,162	12,829.1	13,582.1	1.18	1.12	22.6018%	19.1247%	20.2471%
95-99	4,850	1,808	1,271.0	1,283.3	1.42	1.41	37.2728%	26.2079%	26.4615%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	28,065,180	927,806	1,006,035.8	903,167.7	0.92	1.03	3.3059%	3.5846%	3.2181%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 3A
Mortality Experience of Disabled Annuitants **Calendar Years 2015 - 2019**
Females

Age	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
25-29	8,148	0	51.2	25.8	0.00	0.00	0.0000%	0.6280%	0.3168%
30-34	71,924	842	458.8	340.1	1.84	2.48	1.1706%	0.6379%	0.4728%
35-39	237,676	3,132	1,409.6	1,559.0	2.22	2.01	1.3177%	0.5931%	0.6559%
40-44	530,553	8,935	3,057.2	4,885.3	2.92	1.83	1.6842%	0.5762%	0.9208%
45-49	1,437,047	12,837	9,796.5	19,407.0	1.31	0.66	0.8933%	0.6817%	1.3505%
50-54	2,718,270	37,089	30,022.9	48,139.4	1.24	0.77	1.3644%	1.1045%	1.7710%
55-59	5,079,241	114,857	86,878.1	102,569.6	1.32	1.12	2.2613%	1.7105%	2.0194%
60-64	6,453,160	151,192	143,345.3	138,295.8	1.05	1.09	2.3429%	2.2213%	2.1431%
65-69	5,497,581	162,526	157,426.5	137,813.1	1.03	1.18	2.9563%	2.8636%	2.5068%
70-74	2,880,097	112,098	109,112.5	98,023.4	1.03	1.14	3.8922%	3.7885%	3.4035%
75-79	1,220,604	59,421	63,243.7	63,517.4	0.94	0.94	4.8682%	5.1813%	5.2038%
80-84	656,869	48,576	47,168.7	53,108.4	1.03	0.91	7.3951%	7.1808%	8.0851%
85-89	277,258	35,169	28,810.5	33,516.6	1.22	1.05	12.6845%	10.3913%	12.0886%
90-94	80,895	12,572	12,153.7	13,841.5	1.03	0.91	15.5405%	15.0240%	17.1104%
95-99	28,458	5,390	5,737.0	6,879.7	0.94	0.78	18.9385%	20.1593%	24.1748%
100 and over	5,027	1,249	1,214.3	1,673.0	1.03	0.75	24.8415%	24.1581%	33.2828%
<i>Total</i>	<i>27,182,806</i>	<i>765,885</i>	<i>699,886.5</i>	<i>723,595.1</i>	<i>1.09</i>	<i>1.06</i>	<i>2.8175%</i>	<i>2.5747%</i>	<i>2.6620%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 3B

Mortality Experience of Disabled Annuitants

Males

Year	Benefits Exposed	Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	5,349,284	174,732	185,580.4	166,640.8	0.94	1.05	3.2665%	3.4693%	3.1152%
2016	5,475,962	188,348	193,489.1	173,923.1	0.97	1.08	3.4395%	3.5334%	3.1761%
2017	5,632,329	184,579	201,613.0	181,168.9	0.92	1.02	3.2771%	3.5796%	3.2166%
2018	5,757,800	179,840	208,716.3	187,191.0	0.86	0.96	3.1234%	3.6249%	3.2511%
2019	5,849,806	200,308	216,637.1	194,243.9	0.92	1.03	3.4242%	3.7033%	3.3205%
<i>Total</i>	<i>28,065,180</i>	<i>927,806</i>	<i>1,006,035.8</i>	<i>903,167.7</i>	<i>0.92</i>	<i>1.03</i>	<i>3.3059%</i>	<i>3.5846%</i>	<i>3.2181%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 3B

Year	Benefits Exposed	Mortality Experience of Disabled Annuitants					Females		
		Benefit Weighted Deaths			Ratio of Actual to		Mortality Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	5,230,592	142,880	127,757.5	133,920.4	1.12	1.07	2.7316%	2.4425%	2.5603%
2016	5,346,109	138,935	133,967.5	139,415.8	1.04	1.00	2.5988%	2.5059%	2.6078%
2017	5,448,944	167,468	140,127.3	144,756.5	1.20	1.16	3.0734%	2.5716%	2.6566%
2018	5,529,116	154,172	145,739.9	149,749.3	1.06	1.03	2.7884%	2.6359%	2.7084%
2019	5,628,045	162,430	152,294.3	155,753.1	1.07	1.04	2.8861%	2.7060%	2.7674%
Total	27,182,806	765,885	699,886.5	723,595.1	1.09	1.06	2.8175%	2.5747%	2.6620%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 4A

Calendar Years 2015 - 2019

Disability Experience of Active General Employees

Males

Age	Life Years Exposed	Number of Disabilities			Ratio of Actual to		Disability Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
23	1,231	0	0.3	0.1	0.00	0.00	0.0000%	0.0206%	0.0105%
24	1,754	0	0.4	0.2	0.00	0.00	0.0000%	0.0206%	0.0105%
25	2,006	0	0.4	0.2	0.00	0.00	0.0000%	0.0206%	0.0105%
26	2,274	0	0.8	0.4	0.00	0.00	0.0000%	0.0344%	0.0175%
27	2,740	0	0.9	0.5	0.00	0.00	0.0000%	0.0344%	0.0175%
28	2,956	0	1.5	0.8	0.00	0.00	0.0000%	0.0500%	0.0255%
29	3,034	1	1.9	1.0	0.53	1.04	0.0330%	0.0619%	0.0316%
30	3,428	1	2.1	1.1	0.47	0.92	0.0292%	0.0619%	0.0316%
31	3,501	2	2.4	1.2	0.83	1.63	0.0571%	0.0688%	0.0351%
32	3,636	1	2.8	1.4	0.36	0.71	0.0275%	0.0757%	0.0386%
33	3,749	0	3.1	1.6	0.00	0.00	0.0000%	0.0826%	0.0421%
34	3,862	2	4.0	2.0	0.50	0.98	0.0518%	0.1032%	0.0526%
35	3,949	3	4.3	2.2	0.69	1.35	0.0760%	0.1101%	0.0561%
36	4,105	1	4.8	2.4	0.21	0.41	0.0244%	0.1170%	0.0597%
37	4,070	1	4.8	2.4	0.21	0.41	0.0246%	0.1170%	0.0597%
38	4,083	5	5.1	2.6	0.99	1.94	0.1225%	0.1239%	0.0632%
39	4,105	2	5.4	2.7	0.37	0.73	0.0487%	0.1307%	0.0667%
40	4,089	2	7.0	3.6	0.28	0.56	0.0489%	0.1720%	0.0877%
41	4,215	5	8.1	4.1	0.62	1.21	0.1186%	0.1927%	0.0983%
42	4,232	4	9.3	5.3	0.43	0.76	0.0945%	0.2202%	0.1246%
43	4,473	9	10.8	6.8	0.84	1.33	0.2012%	0.2408%	0.1509%
44	4,896	4	13.1	8.7	0.30	0.46	0.0817%	0.2683%	0.1772%
45	5,201	8	15.7	10.6	0.51	0.76	0.1538%	0.3027%	0.2035%
46	5,338	12	17.3	12.3	0.70	0.98	0.2248%	0.3234%	0.2298%
47	5,569	10	19.5	14.3	0.51	0.70	0.1796%	0.3509%	0.2561%
48	5,592	19	20.0	15.8	0.95	1.20	0.3398%	0.3578%	0.2827%
49	5,730	15	22.9	18.1	0.66	0.83	0.2618%	0.3991%	0.3153%
50	5,985	13	25.1	19.8	0.52	0.66	0.2172%	0.4197%	0.3316%
51	6,131	20	27.4	21.7	0.73	0.92	0.3262%	0.4472%	0.3533%
52	6,465	20	30.2	23.9	0.66	0.84	0.3094%	0.4679%	0.3696%
53	6,797	28	34.6	27.3	0.81	1.02	0.4119%	0.5092%	0.4022%
54	6,879	30	36.4	28.8	0.82	1.04	0.4361%	0.5298%	0.4185%
55	7,043	24	38.8	30.6	0.62	0.78	0.3408%	0.5505%	0.4349%
56	6,997	31	39.5	31.2	0.79	0.99	0.4430%	0.5642%	0.4457%
57	6,925	28	41.0	32.4	0.68	0.86	0.4043%	0.5917%	0.4675%
58	6,825	32	41.3	32.6	0.77	0.98	0.4689%	0.6055%	0.4783%
59	6,755	32	42.8	33.8	0.75	0.95	0.4737%	0.6330%	0.5001%
60	6,087	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
61	5,204	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
62	4,654	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
63	3,800	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
64	3,126	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65	2,568	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
66	1,985	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
67	1,503	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
68	1,206	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
69	1,004	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70	673	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
71	528	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
72	402	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
73	296	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
74	231	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75	210	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
76	180	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
77	160	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
78	106	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
79	78	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80	56	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
81	43	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
82	34	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 4A

Calendar Years 2015 - 2019

Disability Experience of Active General Employees

Males

Age	Life Years Exposed	Number of Disabilities			Ratio of Actual to		Disability Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	15	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
84	22	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85	14	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
86	10	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
87	9	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
88	3	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
89	3	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90	3	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
93	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
96	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
97	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>206,754</i>	<i>365</i>	<i>545.8</i>	<i>404.4</i>	<i>0.67</i>	<i>0.90</i>	<i>0.1765%</i>	<i>0.2640%</i>	<i>0.1956%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 4A

Calendar Years 2015 - 2019

Disability Experience of Active General Employees

Females

Age	Life Years Exposed	Number of Disabilities			Ratio of Actual to		Disability Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
23	1,419	0	0.5	0.3	0.00	0.00	0.0000%	0.0348%	0.0195%
24	1,837	0	0.6	0.4	0.00	0.00	0.0000%	0.0348%	0.0195%
25	2,170	0	0.8	0.4	0.00	0.00	0.0000%	0.0348%	0.0195%
26	2,494	1	1.0	0.6	1.01	1.80	0.0401%	0.0398%	0.0223%
27	2,727	1	1.4	0.8	0.74	1.32	0.0367%	0.0497%	0.0278%
28	2,975	0	1.5	0.8	0.00	0.00	0.0000%	0.0497%	0.0278%
29	3,116	1	2.2	1.2	0.46	0.82	0.0321%	0.0696%	0.0390%
30	3,279	0	2.8	1.6	0.00	0.00	0.0000%	0.0845%	0.0473%
31	3,417	1	3.4	1.9	0.29	0.53	0.0293%	0.0995%	0.0557%
32	3,667	3	4.0	2.2	0.75	1.34	0.0818%	0.1094%	0.0613%
33	3,861	1	5.0	2.8	0.20	0.36	0.0259%	0.1293%	0.0724%
34	4,036	5	5.6	3.1	0.89	1.59	0.1239%	0.1392%	0.0780%
35	4,156	5	6.0	3.4	0.83	1.49	0.1203%	0.1442%	0.0808%
36	4,332	3	6.5	3.6	0.46	0.83	0.0693%	0.1492%	0.0835%
37	4,356	3	6.7	3.8	0.45	0.80	0.0689%	0.1542%	0.0863%
38	4,360	5	7.4	4.8	0.68	1.05	0.1147%	0.1691%	0.1093%
39	4,381	3	7.8	5.8	0.38	0.52	0.0685%	0.1790%	0.1323%
40	4,423	6	8.4	6.9	0.72	0.87	0.1357%	0.1890%	0.1553%
41	4,429	8	9.3	7.9	0.86	1.01	0.1806%	0.2089%	0.1783%
42	4,480	7	10.2	9.0	0.68	0.78	0.1563%	0.2287%	0.2013%
43	4,608	8	11.7	10.3	0.68	0.78	0.1736%	0.2536%	0.2232%
44	4,966	10	13.1	11.5	0.76	0.87	0.2014%	0.2636%	0.2319%
45	5,258	16	15.7	13.8	1.02	1.16	0.3043%	0.2984%	0.2626%
46	5,560	23	18.5	16.3	1.24	1.41	0.4137%	0.3332%	0.2932%
47	5,824	16	20.9	18.3	0.77	0.87	0.2747%	0.3580%	0.3151%
48	5,979	15	23.8	20.9	0.63	0.72	0.2509%	0.3978%	0.3501%
49	6,060	14	25.9	22.8	0.54	0.61	0.2310%	0.4277%	0.3763%
50	6,143	15	27.8	24.5	0.54	0.61	0.2442%	0.4525%	0.3982%
51	6,302	21	29.8	26.2	0.71	0.80	0.3332%	0.4724%	0.4157%
52	6,569	27	32.7	28.7	0.83	0.94	0.4110%	0.4973%	0.4376%
53	6,835	24	36.0	31.7	0.67	0.76	0.3511%	0.5271%	0.4639%
54	7,015	31	38.4	33.8	0.81	0.92	0.4419%	0.5470%	0.4814%
55	6,995	44	40.0	35.2	1.10	1.25	0.6290%	0.5719%	0.5032%
56	6,936	33	41.4	36.4	0.80	0.91	0.4758%	0.5967%	0.5251%
57	6,901	34	42.9	37.7	0.79	0.90	0.4927%	0.6216%	0.5470%
58	6,872	33	44.4	39.1	0.74	0.84	0.4802%	0.6464%	0.5689%
59	6,555	38	44.0	38.7	0.86	0.98	0.5797%	0.6713%	0.5908%
60	5,899	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
61	4,802	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
62	4,090	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
63	3,247	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
64	2,690	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65	2,078	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
66	1,473	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
67	1,019	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
68	810	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
69	582	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70	437	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
71	315	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
72	250	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
73	177	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
74	140	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75	104	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
76	85	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
77	51	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
78	39	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
79	34	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80	24	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
81	17	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
82	15	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 4A

Calendar Years 2015 - 2019

Disability Experience of Active General Employees

Females

Age	Life Years Exposed	Number of Disabilities			Ratio of Actual to		Disability Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	13	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
84	7	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85	5	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
86	6	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
87	2	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
88	2	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
89	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
93	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
94	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
96	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
97	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	205,900	455	597.8	507.2	0.76	0.90	0.2210%	0.2903%	0.2463%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 4A **Calendar Years 2015 - 2019**
Disability Experience of Active General Employees **Males**

Age	Life Years Exposed	Number of Disabilities			Ratio of Actual to		Disability Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	4,906	0	0.6	0.3	0.00	0.00	0.0000%	0.0126%	0.0064%
25-29	13,010	1	5.5	2.8	0.18	0.36	0.0077%	0.0422%	0.0215%
30-34	18,176	6	14.4	7.3	0.42	0.82	0.0330%	0.0790%	0.0403%
35-39	20,312	12	24.3	12.4	0.49	0.97	0.0591%	0.1198%	0.0611%
40-44	21,905	24	48.4	28.4	0.50	0.84	0.1096%	0.2209%	0.1298%
45-49	27,430	64	95.4	71.0	0.67	0.90	0.2333%	0.3479%	0.2588%
50-54	32,257	111	153.8	121.5	0.72	0.91	0.3441%	0.4769%	0.3768%
55-59	34,545	147	203.3	160.6	0.72	0.92	0.4255%	0.5885%	0.4649%
60-64	22,871	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65-69	8,266	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70-74	2,130	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75-79	734	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80-84	170	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85-89	39	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90-94	3	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>206,754</i>	<i>365</i>	<i>545.8</i>	<i>404.4</i>	<i>0.67</i>	<i>0.90</i>	<i>0.1765%</i>	<i>0.2640%</i>	<i>0.1956%</i>

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 4A Calendar Years 2015 - 2019
Disability Experience of Active General Employees **Females**

Age	Life Years Exposed	Number of Disabilities			Ratio of Actual to		Disability Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	5,444	0	1.1	0.6	0.00	0.00	0.0000%	0.0208%	0.0117%
25-29	13,482	3	6.8	3.8	0.44	0.79	0.0223%	0.0501%	0.0280%
30-34	18,260	10	20.8	11.6	0.48	0.86	0.0548%	0.1139%	0.0638%
35-39	21,585	19	34.4	21.3	0.55	0.89	0.0880%	0.1593%	0.0987%
40-44	22,906	39	52.6	45.6	0.74	0.86	0.1703%	0.2298%	0.1990%
45-49	28,681	84	104.8	92.2	0.80	0.91	0.2929%	0.3653%	0.3214%
50-54	32,864	118	164.6	144.9	0.72	0.81	0.3591%	0.5010%	0.4408%
55-59	34,259	182	212.7	187.2	0.86	0.97	0.5312%	0.6209%	0.5464%
60-64	20,728	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65-69	5,962	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70-74	1,319	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75-79	313	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80-84	76	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85-89	16	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90-94	2	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95-99	3	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>205,900</i>	<i>455</i>	<i>597.8</i>	<i>507.2</i>	<i>0.76</i>	<i>0.90</i>	<i>0.2210%</i>	<i>0.2903%</i>	<i>0.2463%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 4B

Disability Experience of Active General Employees

Males

Year	Life Years Exposed	Number of Disabilities			Ratio of Actual to		Disability Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	42,352	83	114.5	85.1	0.73	0.98	0.1960%	0.2702%	0.2008%
2016	41,927	85	111.4	82.7	0.76	1.03	0.2027%	0.2658%	0.1971%
2017	41,927	74	111.4	82.7	0.66	0.90	0.1765%	0.2658%	0.1971%
2018	40,493	63	105.5	78.1	0.60	0.81	0.1556%	0.2605%	0.1929%
2019	40,055	60	102.9	76.1	0.58	0.79	0.1498%	0.2569%	0.1901%
Total	206,754	365	545.8	404.6	0.67	0.90	0.1765%	0.2640%	0.1957%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 4B

Disability Experience of Active General Employees

Females

Year	Life Years Exposed	Number of Disabilities			Ratio of Actual to		Disability Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	41,804	100	124.7	106.0	0.80	0.94	0.2392%	0.2984%	0.2537%
2016	41,818	108	123.0	104.4	0.88	1.03	0.2583%	0.2942%	0.2497%
2017	41,492	103	120.1	101.8	0.86	1.01	0.2482%	0.2894%	0.2453%
2018	40,583	84	116.1	98.4	0.72	0.85	0.2070%	0.2862%	0.2425%
2019	40,203	60	113.9	96.4	0.53	0.62	0.1492%	0.2833%	0.2399%
<i>Total</i>	<i>205,900</i>	<i>455</i>	<i>597.8</i>	<i>507.1</i>	<i>0.76</i>	<i>0.90</i>	<i>0.2210%</i>	<i>0.2904%</i>	<i>0.2463%</i>

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 5A Calendar Years 2015 - 2019
Early Retirement Experience of Active General Employees with 5 - 14 Years of Service **Males**

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
21	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	2.2000%
22	0	0	0.0	0.0	0.00	0.00	0.0000%	2.0000%	2.2000%
23	3	0	0.1	0.1	0.00	0.00	0.0000%	2.0000%	2.2000%
24	11	1	0.2	0.2	4.55	4.13	9.0909%	2.0000%	2.2000%
25	38	5	0.8	0.8	6.58	5.98	13.1579%	2.0000%	2.2000%
26	128	1	2.6	2.8	0.39	0.36	0.7813%	2.0000%	2.2000%
27	263	10	5.3	5.8	1.90	1.73	3.8023%	2.0000%	2.2000%
28	432	11	8.6	9.5	1.27	1.16	2.5463%	2.0000%	2.2000%
29	720	18	21.6	15.8	0.83	1.14	2.5000%	3.0000%	2.2000%
30	1,081	25	17.3	23.8	1.45	1.05	2.3127%	1.6000%	2.2000%
31	1,354	19	21.7	29.8	0.88	0.64	1.4032%	1.6000%	2.2000%
32	1,603	31	25.6	35.3	1.21	0.88	1.9339%	1.6000%	2.2000%
33	1,880	35	30.1	41.4	1.16	0.85	1.8617%	1.6000%	2.2000%
34	2,019	33	32.3	44.4	1.02	0.74	1.6345%	1.6000%	2.2000%
35	2,051	25	32.8	26.7	0.76	0.94	1.2189%	1.6000%	1.3000%
36	2,099	37	33.6	27.3	1.10	1.36	1.7627%	1.6000%	1.3000%
37	2,086	32	33.4	27.1	0.96	1.18	1.5340%	1.6000%	1.3000%
38	1,945	21	31.1	25.3	0.67	0.83	1.0797%	1.6000%	1.3000%
39	1,860	33	29.8	24.2	1.11	1.36	1.7742%	1.6000%	1.3000%
40	1,740	19	27.8	17.4	0.68	1.09	1.0920%	1.6000%	1.0000%
41	1,694	14	27.1	16.9	0.52	0.83	0.8264%	1.6000%	1.0000%
42	1,682	16	26.9	16.8	0.59	0.95	0.9512%	1.6000%	1.0000%
43	1,722	18	27.6	17.2	0.65	1.05	1.0453%	1.6000%	1.0000%
44	1,729	14	27.7	17.3	0.51	0.81	0.8097%	1.6000%	1.0000%
45	1,773	16	23.9	17.7	0.67	0.90	0.9024%	1.3500%	1.0000%
46	1,768	21	23.9	17.7	0.88	1.19	1.1878%	1.3500%	1.0000%
47	1,734	9	23.4	17.3	0.38	0.52	0.5190%	1.3500%	1.0000%
48	1,725	21	23.3	17.2	0.90	1.22	1.2174%	1.3500%	1.0000%
49	1,684	26	22.7	16.8	1.14	1.54	1.5439%	1.3500%	1.0000%
50	1,683	21	22.7	16.8	0.92	1.25	1.2478%	1.3500%	1.0000%
51	1,655	13	22.3	16.5	0.58	0.79	0.7855%	1.3500%	1.0000%
52	1,714	20	23.1	17.1	0.86	1.17	1.1669%	1.3500%	1.0000%
53	1,747	19	23.6	17.5	0.81	1.09	1.0876%	1.3500%	1.0000%
54	1,787	18	24.1	17.9	0.75	1.01	1.0073%	1.3500%	1.0000%
55	1,748	24	23.6	35.0	1.02	0.69	1.3730%	1.3500%	2.0000%
56	1,770	22	23.9	35.4	0.92	0.62	1.2429%	1.3500%	2.0000%
57	1,726	23	23.3	34.5	0.99	0.67	1.3326%	1.3500%	2.0000%
58	1,758	27	23.7	35.2	1.14	0.77	1.5358%	1.3500%	2.0000%
59	1,757	74	23.7	35.1	3.12	2.11	4.2117%	1.3500%	2.0000%
60	4	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
61	6	1	0.0	0.0	0.00	0.00	16.6667%	0.0000%	0.0000%
62	9	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
63	7	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
64	9	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
66	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
67	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
68	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
71	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
72	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
73	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
76	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
77	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
78	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
81	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
82	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 5A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 5 - 14 Years of Service

Males

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
86	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
87	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
88	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
93	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
96	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
97	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>54,204</i>	<i>773</i>	<i>815.2</i>	<i>773.8</i>	<i>0.95</i>	<i>1.00</i>	<i>1.4261%</i>	<i>1.5040%</i>	<i>1.4275%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 5A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 5 - 14 Years of Service

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
21	0	0	0.0	0.0	0.00	0.00	0.0000%	3.7000%	4.0000%
22	0	0	0.0	0.0	0.00	0.00	0.0000%	3.7000%	4.0000%
23	4	0	0.1	0.2	0.00	0.00	0.0000%	3.7000%	4.0000%
24	29	2	1.1	1.2	1.86	1.72	6.8966%	3.7000%	4.0000%
25	59	0	2.2	2.4	0.00	0.00	0.0000%	3.7000%	4.0000%
26	148	3	5.5	5.9	0.55	0.51	2.0270%	3.7000%	4.0000%
27	264	2	9.8	10.6	0.20	0.19	0.7576%	3.7000%	4.0000%
28	448	15	16.6	17.9	0.90	0.84	3.3482%	3.7000%	4.0000%
29	705	33	26.1	28.2	1.27	1.17	4.6809%	3.7000%	4.0000%
30	984	28	18.7	19.7	1.50	1.42	2.8455%	1.9000%	2.0000%
31	1,261	24	24.0	25.2	1.00	0.95	1.9033%	1.9000%	2.0000%
32	1,573	37	29.9	31.5	1.24	1.18	2.3522%	1.9000%	2.0000%
33	1,806	45	34.3	36.1	1.31	1.25	2.4917%	1.9000%	2.0000%
34	1,958	32	37.2	39.2	0.86	0.82	1.6343%	1.9000%	2.0000%
35	2,068	45	39.3	41.4	1.15	1.09	2.1760%	1.9000%	2.0000%
36	2,115	43	40.2	42.3	1.07	1.02	2.0331%	1.9000%	2.0000%
37	2,069	39	39.3	41.4	0.99	0.94	1.8850%	1.9000%	2.0000%
38	1,969	37	37.4	39.4	0.99	0.94	1.8791%	1.9000%	2.0000%
39	1,891	32	35.9	37.8	0.89	0.85	1.6922%	1.9000%	2.0000%
40	1,816	29	34.5	25.4	0.84	1.14	1.5969%	1.9000%	1.4000%
41	1,735	21	33.0	24.3	0.64	0.86	1.2104%	1.9000%	1.4000%
42	1,720	34	32.7	24.1	1.04	1.41	1.9767%	1.9000%	1.4000%
43	1,738	12	33.0	24.3	0.36	0.49	0.6904%	1.9000%	1.4000%
44	1,771	35	33.6	24.8	1.04	1.41	1.9763%	1.9000%	1.4000%
45	1,823	15	34.6	25.5	0.43	0.59	0.8228%	1.9000%	1.4000%
46	1,889	28	35.9	26.4	0.78	1.06	1.4823%	1.9000%	1.4000%
47	1,882	18	35.8	26.3	0.50	0.68	0.9564%	1.9000%	1.4000%
48	1,874	26	35.6	26.2	0.73	0.99	1.3874%	1.9000%	1.4000%
49	1,838	24	34.9	25.7	0.69	0.93	1.3058%	1.9000%	1.4000%
50	1,872	21	35.6	26.2	0.59	0.80	1.1218%	1.9000%	1.4000%
51	1,888	35	35.9	26.4	0.98	1.32	1.8538%	1.9000%	1.4000%
52	1,950	29	37.1	27.3	0.78	1.06	1.4872%	1.9000%	1.4000%
53	1,987	28	37.8	27.8	0.74	1.01	1.4092%	1.9000%	1.4000%
54	2,035	35	38.7	28.5	0.91	1.23	1.7199%	1.9000%	1.4000%
55	1,975	20	37.5	45.4	0.53	0.44	1.0127%	1.9000%	2.3000%
56	1,948	38	37.0	44.8	1.03	0.85	1.9507%	1.9000%	2.3000%
57	1,976	42	37.5	45.4	1.12	0.92	2.1255%	1.9000%	2.3000%
58	1,937	39	36.8	44.6	1.06	0.88	2.0134%	1.9000%	2.3000%
59	1,870	86	35.5	43.0	2.42	2.00	4.5989%	1.9000%	2.3000%
60	2	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
61	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
62	3	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
63	4	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
64	1	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
66	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
67	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
68	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
71	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
72	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
73	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
76	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
77	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
78	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
81	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
82	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 5A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 5 - 14 Years of Service

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
86	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
87	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
88	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
93	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
96	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
97	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	56,886	1,032	1,110.5	1,032.9	0.93	1.00	1.8142%	1.9521%	1.8156%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 5A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 5 - 14 Years of Service

Males

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	14	1	0.3	0.3	3.57	3.25	7.1429%	2.0000%	2.2000%
25-29	1,581	45	38.8	34.8	1.16	1.29	2.8463%	2.4554%	2.2000%
30-34	7,937	143	127.0	174.6	1.13	0.82	1.8017%	1.6000%	2.2000%
35-39	10,041	148	160.7	130.5	0.92	1.13	1.4740%	1.6000%	1.3000%
40-44	8,567	81	137.1	85.7	0.59	0.95	0.9455%	1.6000%	1.0000%
45-49	8,684	93	117.2	86.8	0.79	1.07	1.0709%	1.3500%	1.0000%
50-54	8,586	91	115.9	85.9	0.79	1.06	1.0599%	1.3500%	1.0000%
55-59	8,759	170	118.2	175.2	1.44	0.97	1.9409%	1.3500%	2.0000%
60-64	35	1	0.0	0.0	0.00	0.00	2.8571%	0.0000%	0.0000%
65-69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70-74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75-79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80-84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85-89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90-94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>54,204</i>	<i>773</i>	<i>815.2</i>	<i>773.8</i>	<i>0.95</i>	<i>1.00</i>	<i>1.4261%</i>	<i>1.5040%</i>	<i>1.4275%</i>

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 5A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 5 - 14 Years of Service

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	33	2	1.2	1.3	1.64	1.52	6.0606%	3.7000%	4.0000%
25-29	1,624	53	60.1	65.0	0.88	0.82	3.2635%	3.7000%	4.0000%
30-34	7,582	166	144.1	151.6	1.15	1.09	2.1894%	1.9000%	2.0000%
35-39	10,112	196	192.1	202.2	1.02	0.97	1.9383%	1.9000%	2.0000%
40-44	8,780	131	166.8	122.9	0.79	1.07	1.4920%	1.9000%	1.4000%
45-49	9,306	111	176.8	130.3	0.63	0.85	1.1928%	1.9000%	1.4000%
50-54	9,732	148	184.9	136.2	0.80	1.09	1.5208%	1.9000%	1.4000%
55-59	9,706	225	184.4	223.2	1.22	1.01	2.3182%	1.9000%	2.3000%
60-64	11	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65-69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70-74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75-79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80-84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85-89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90-94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>56,886</i>	<i>1,032</i>	<i>1,110.5</i>	<i>1,032.9</i>	<i>0.93</i>	<i>1.00</i>	<i>1.8142%</i>	<i>1.9521%</i>	<i>1.8156%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 5B

Early Retirement Experience of Active General Employees with 5 - 14 Years of Service

Males

Year	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	13,213	188	200.4	191.7	0.94	0.98	1.4228%	1.5163%	1.4506%
2016	12,711	174	192.2	184.0	0.91	0.95	1.3689%	1.5124%	1.4475%
2017	11,040	170	165.8	156.9	1.03	1.08	1.5399%	1.5022%	1.4211%
2018	9,329	136	139.3	131.6	0.98	1.03	1.4578%	1.4936%	1.4103%
2019	7,911	105	117.4	109.7	0.89	0.96	1.3273%	1.4844%	1.3863%
Total	54,204	773	815.2	773.8	0.95	1.00	1.4261%	1.5040%	1.4275%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 5B

Early Retirement Experience of Active General Employees with 5 - 14 Years of Service

Females

Year	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	13,948	249	275.8	257.4	0.90	0.97	1.7852%	1.9777%	1.8451%
2016	13,470	249	265.5	248.1	0.94	1.00	1.8486%	1.9709%	1.8415%
2017	11,520	219	224.0	208.3	0.98	1.05	1.9010%	1.9445%	1.8077%
2018	9,680	181	186.7	173.2	0.97	1.05	1.8698%	1.9292%	1.7888%
2019	8,268	134	158.4	146.0	0.85	0.92	1.6207%	1.9154%	1.7663%
Total	56,886	1,032	1,110.5	1,032.9	0.93	1.00	1.8142%	1.9521%	1.8156%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 6A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 15 or more Years of Service

Males

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
31	4	0	0.0	0.0	0.00	0.00	0.0000%	1.0000%	0.8000%
32	6	0	0.1	0.0	0.00	0.00	0.0000%	1.0000%	0.8000%
33	17	0	0.2	0.1	0.00	0.00	0.0000%	1.0000%	0.8000%
34	83	1	0.8	0.7	1.20	1.51	1.2048%	1.0000%	0.8000%
35	211	0	2.1	1.7	0.00	0.00	0.0000%	1.0000%	0.8000%
36	317	2	3.2	2.5	0.63	0.79	0.6309%	1.0000%	0.8000%
37	439	6	4.4	3.5	1.37	1.71	1.3667%	1.0000%	0.8000%
38	613	4	6.1	4.9	0.65	0.82	0.6525%	1.0000%	0.8000%
39	782	6	7.8	6.3	0.77	0.96	0.7673%	1.0000%	0.8000%
40	881	6	8.8	5.3	0.68	1.14	0.6810%	1.0000%	0.6000%
41	1,093	5	10.9	6.6	0.46	0.76	0.4575%	1.0000%	0.6000%
42	1,202	6	12.0	7.2	0.50	0.83	0.4992%	1.0000%	0.6000%
43	1,375	7	13.8	8.3	0.51	0.85	0.5091%	1.0000%	0.6000%
44	1,729	9	17.3	10.4	0.52	0.87	0.5205%	1.0000%	0.6000%
45	2,004	14	20.0	12.0	0.70	1.16	0.6986%	1.0000%	0.6000%
46	2,180	19	21.8	13.1	0.87	1.45	0.8716%	1.0000%	0.6000%
47	2,465	27	49.3	27.1	0.55	1.00	1.0953%	2.0000%	1.1000%
48	2,593	23	51.9	28.5	0.44	0.81	0.8870%	2.0000%	1.1000%
49	2,735	31	54.7	30.1	0.57	1.03	1.1335%	2.0000%	1.1000%
50	2,938	44	58.8	32.3	0.75	1.36	1.4976%	2.0000%	1.1000%
51	3,174	48	63.5	34.9	0.76	1.37	1.5123%	2.0000%	1.1000%
52	3,350	63	100.5	80.4	0.63	0.78	1.8806%	3.0000%	2.4000%
53	3,590	113	143.6	114.9	0.79	0.98	3.1476%	4.0000%	3.2000%
54	3,670	153	183.5	146.8	0.83	1.04	4.1689%	5.0000%	4.0000%
55	3,783	197	227.0	189.1	0.87	1.04	5.2075%	6.0000%	5.0000%
56	3,660	220	256.2	201.3	0.86	1.09	6.0109%	7.0000%	5.5000%
57	3,546	217	283.7	223.4	0.76	0.97	6.1196%	8.0000%	6.3000%
58	3,451	270	345.1	276.1	0.78	0.98	7.8238%	10.0000%	8.0000%
59	3,322	516	664.4	531.5	0.78	0.97	15.5328%	20.0000%	16.0000%
60	14	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
61	15	1	0.0	0.0	0.00	0.00	6.6667%	0.0000%	0.0000%
62	10	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
63	6	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
64	6	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
66	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
67	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
68	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
71	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
72	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
73	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
76	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
77	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
78	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
81	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
82	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 6A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 15 or more Years of Service

Males

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
86	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
87	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
88	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
93	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
96	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
97	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>55,264</i>	<i>2,008</i>	<i>2,611.4</i>	<i>1,999.0</i>	<i>0.77</i>	<i>1.00</i>	<i>3.6335%</i>	<i>4.7254%</i>	<i>3.6173%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 6A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 15 or more Years of Service

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
31	0	0	0.0	0.0	0.00	0.00	0.0000%	1.2000%	1.4000%
32	3	0	0.0	0.0	0.00	0.00	0.0000%	1.2000%	1.4000%
33	33	1	0.4	0.5	2.53	2.16	3.0303%	1.2000%	1.4000%
34	132	0	1.6	1.8	0.00	0.00	0.0000%	1.2000%	1.4000%
35	262	7	3.1	3.7	2.23	1.91	2.6718%	1.2000%	1.4000%
36	380	6	4.6	5.3	1.32	1.13	1.5789%	1.2000%	1.4000%
37	508	11	6.1	7.1	1.80	1.55	2.1654%	1.2000%	1.4000%
38	688	7	8.3	9.6	0.85	0.73	1.0174%	1.2000%	1.4000%
39	846	14	10.2	11.8	1.38	1.18	1.6548%	1.2000%	1.4000%
40	1,002	10	12.0	13.0	0.83	0.77	0.9980%	1.2000%	1.3000%
41	1,152	12	13.8	15.0	0.87	0.80	1.0417%	1.2000%	1.3000%
42	1,266	18	15.2	16.5	1.18	1.09	1.4218%	1.2000%	1.3000%
43	1,388	19	22.2	18.0	0.86	1.05	1.3689%	1.6000%	1.3000%
44	1,687	22	27.0	21.9	0.82	1.00	1.3041%	1.6000%	1.3000%
45	1,897	27	30.4	24.7	0.89	1.09	1.4233%	1.6000%	1.3000%
46	2,144	27	34.3	27.9	0.79	0.97	1.2593%	1.6000%	1.3000%
47	2,411	28	38.6	31.3	0.73	0.89	1.1613%	1.6000%	1.3000%
48	2,554	32	40.9	33.2	0.78	0.96	1.2529%	1.6000%	1.3000%
49	2,668	38	42.7	34.7	0.89	1.10	1.4243%	1.6000%	1.3000%
50	2,772	59	55.4	44.4	1.06	1.33	2.1284%	2.0000%	1.6000%
51	2,937	68	88.1	70.5	0.77	0.96	2.3153%	3.0000%	2.4000%
52	3,150	100	157.5	141.8	0.63	0.71	3.1746%	5.0000%	4.5000%
53	3,251	145	195.1	146.3	0.74	0.99	4.4602%	6.0000%	4.5000%
54	3,217	155	193.0	144.8	0.80	1.07	4.8182%	6.0000%	4.5000%
55	3,205	162	192.3	144.2	0.84	1.12	5.0546%	6.0000%	4.5000%
56	3,171	178	222.0	174.4	0.80	1.02	5.6134%	7.0000%	5.5000%
57	3,080	201	246.4	194.0	0.82	1.04	6.5260%	8.0000%	6.3000%
58	3,054	202	305.4	244.3	0.66	0.83	6.6143%	10.0000%	8.0000%
59	2,884	496	576.8	461.4	0.86	1.07	17.1983%	20.0000%	16.0000%
60	6	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
61	4	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
62	2	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
63	3	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
64	3	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
66	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
67	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
68	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
71	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
72	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
73	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
76	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
77	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
78	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
81	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
82	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 6A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 15 or more Years of Service

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
83	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
86	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
87	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
88	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
93	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
96	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
97	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>51,760</i>	<i>2,045</i>	<i>2,543.2</i>	<i>2,042.2</i>	<i>0.80</i>	<i>1.00</i>	<i>3.9509%</i>	<i>4.9135%</i>	<i>3.9455%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 6A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 15 or more Years of Service

Males

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
25-29	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
30-34	110	1	1.1	0.9	0.91	1.14	0.9091%	1.0000%	0.8000%
35-39	2,362	18	23.6	18.9	0.76	0.95	0.7621%	1.0000%	0.8000%
40-44	6,280	33	62.8	37.7	0.53	0.88	0.5255%	1.0000%	0.6000%
45-49	11,977	114	197.7	110.8	0.58	1.03	0.9518%	1.6507%	0.9253%
50-54	16,722	421	549.8	409.3	0.77	1.03	2.5176%	3.2881%	2.4477%
55-59	17,762	1,420	1,776.4	1,421.4	0.80	1.00	7.9946%	10.0009%	8.0027%
60-64	51	1	0.0	0.0	0.00	0.00	1.9608%	0.0000%	0.0000%
65-69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70-74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75-79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80-84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85-89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90-94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	55,264	2,008	2,611.4	1,999.0	0.77	1.00	3.6335%	4.7254%	3.6173%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 6A

Calendar Years 2015 - 2019

Early Retirement Experience of Active General Employees with 15 or more Years of Service

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
25-29	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
30-34	168	1	2.0	2.4	0.50	0.43	0.5952%	1.2000%	1.4000%
35-39	2,684	45	32.2	37.6	1.40	1.20	1.6766%	1.2000%	1.4000%
40-44	6,495	81	90.2	84.4	0.90	0.96	1.2471%	1.3894%	1.3000%
45-49	11,674	152	186.8	151.8	0.81	1.00	1.3020%	1.6000%	1.3000%
50-54	15,327	527	689.1	547.7	0.76	0.96	3.4384%	4.4962%	3.5731%
55-59	15,394	1,239	1,542.9	1,218.4	0.80	1.02	8.0486%	10.0225%	7.9150%
60-64	18	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65-69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70-74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75-79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80-84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85-89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90-94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>51,760</i>	<i>2,045</i>	<i>2,543.2</i>	<i>2,042.2</i>	<i>0.80</i>	<i>1.00</i>	<i>3.9509%</i>	<i>4.9135%</i>	<i>3.9455%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 6B

Early Retirement Experience of Active General Employees with 15 or more Years of Service

Males

Year	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	11,555	498	545.3	417.4	0.91	1.19	4.3098%	4.7188%	3.6125%
2016	11,198	434	529.2	405.3	0.82	1.07	3.8757%	4.7258%	3.6191%
2017	11,198	346	529.2	405.3	0.65	0.85	3.0898%	4.7258%	3.6191%
2018	10,788	366	507.6	388.4	0.72	0.94	3.3927%	4.7054%	3.6001%
2019	10,525	364	500.2	382.7	0.73	0.95	3.4584%	4.7521%	3.6363%
Total	55,264	2,008	2,611.4	1,999.0	0.77	1.00	3.6335%	4.7254%	3.6173%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 6B

Early Retirement Experience of Active General Employees with 15 or more Years of Service

Females

Year	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	10,891	501	533.1	427.5	0.94	1.17	4.6001%	4.8951%	3.9251%
2016	10,489	425	517.9	415.8	0.82	1.02	4.0519%	4.9376%	3.9645%
2017	10,303	403	502.0	403.2	0.80	1.00	3.9115%	4.8728%	3.9132%
2018	10,180	341	498.3	400.3	0.68	0.85	3.3497%	4.8946%	3.9323%
2019	9,897	375	491.9	395.4	0.76	0.95	3.7890%	4.9703%	3.9952%
Total	51,760	2,045	2,543.2	2,042.2	0.80	1.00	3.9509%	4.9135%	3.9455%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 7A

Calendar Years 2015 - 2019

Superannuation Retirement Experience of Active General Employees

Males

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
45	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
46	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
47	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
48	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
49	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
50	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
51	1	0	0.2	0.2	0.00	0.00	0.0000%	15.0000%	15.0000%
52	11	2	1.6	1.6	1.21	1.21	18.1818%	15.0000%	15.0000%
53	47	4	9.4	7.1	0.43	0.57	8.5106%	20.0000%	15.0000%
54	150	29	33.8	22.5	0.86	1.29	19.3333%	22.5000%	15.0000%
55	226	56	52.0	45.2	1.08	1.24	24.7788%	23.0000%	20.0000%
56	297	46	69.8	59.4	0.66	0.77	15.4882%	23.5000%	20.0000%
57	420	82	100.8	84.0	0.81	0.98	19.5238%	24.0000%	20.0000%
58	447	108	120.7	111.7	0.89	0.97	24.1611%	27.0000%	25.0000%
59	503	131	150.9	125.7	0.87	1.04	26.0437%	30.0000%	25.0000%
60	5,077	1,095	1,269.3	1,015.4	0.86	1.08	21.5679%	25.0000%	20.0000%
61	4,197	692	839.4	839.4	0.82	0.82	16.4880%	20.0000%	20.0000%
62	3,767	773	941.8	753.4	0.82	1.03	20.5203%	25.0000%	20.0000%
63	3,050	532	610.0	610.0	0.87	0.87	17.4426%	20.0000%	20.0000%
64	2,491	497	498.2	498.2	1.00	1.00	19.9518%	20.0000%	20.0000%
65	2,380	610	595.0	618.8	1.03	0.99	25.6303%	25.0000%	26.0000%
66	1,806	485	451.5	469.6	1.07	1.03	26.8549%	25.0000%	26.0000%
67	1,363	304	306.7	354.4	0.99	0.86	22.3037%	22.5000%	26.0000%
68	1,084	216	243.9	243.9	0.89	0.89	19.9262%	22.5000%	22.5000%
69	917	191	206.3	206.3	0.93	0.93	20.8288%	22.5000%	22.5000%
70	612	151	137.7	137.7	1.10	1.10	24.6732%	22.5000%	22.5000%
71	481	117	96.2	96.2	1.22	1.22	24.3243%	20.0000%	20.0000%
72	368	53	73.6	73.6	0.72	0.72	14.4022%	20.0000%	20.0000%
73	268	49	53.6	53.6	0.91	0.91	18.2836%	20.0000%	20.0000%
74	198	44	39.6	39.6	1.11	1.11	22.2222%	20.0000%	20.0000%
75	189	31	37.8	37.8	0.82	0.82	16.4021%	20.0000%	20.0000%
76	167	25	33.4	33.4	0.75	0.75	14.9701%	20.0000%	20.0000%
77	155	31	31.0	31.0	1.00	1.00	20.0000%	20.0000%	20.0000%
78	98	23	19.6	19.6	1.17	1.17	23.4694%	20.0000%	20.0000%
79	73	20	14.6	14.6	1.37	1.37	27.3973%	20.0000%	20.0000%
80	53	20	53.0	53.0	0.38	0.38	37.7358%	100.0000%	100.0000%
81	41	7	41.0	41.0	0.17	0.17	17.0732%	100.0000%	100.0000%
82	33	7	33.0	33.0	0.21	0.21	21.2121%	100.0000%	100.0000%
83	14	3	14.0	14.0	0.21	0.21	21.4286%	100.0000%	100.0000%
84	21	3	21.0	21.0	0.14	0.14	14.2857%	100.0000%	100.0000%
85	14	6	14.0	14.0	0.43	0.43	42.8571%	100.0000%	100.0000%
86	10	2	10.0	10.0	0.20	0.20	20.0000%	100.0000%	100.0000%
87	9	2	9.0	9.0	0.22	0.22	22.2222%	100.0000%	100.0000%
88	3	1	3.0	3.0	0.33	0.33	33.3333%	100.0000%	100.0000%
89	3	1	3.0	3.0	0.33	0.33	33.3333%	100.0000%	100.0000%
90	3	1	3.0	3.0	0.33	0.33	33.3333%	100.0000%	100.0000%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
93	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
94	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
95	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 7A

Calendar Years 2015 - 2019

Superannuation Retirement Experience of Active General Employees

Males

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
96	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
97	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
110	0	0	0.0	0.0	0.0	0.0	0.0000%	100.0000%	100.0000%
Total	31,047	6,450	7,242.2	6,807.9	0.89	0.95	20.7750%	23.3266%	21.9278%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 7A

Calendar Years 2015 - 2019

Superannuation Retirement Experience of Active General Employees

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
45	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
46	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
47	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
48	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
49	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
50	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
51	2	0	0.3	0.3	0.00	0.00	0.0000%	15.0000%	15.0000%
52	13	3	1.9	1.9	1.54	1.54	23.0769%	15.0000%	15.0000%
53	146	29	33.6	33.6	0.86	0.86	19.8630%	23.0000%	23.0000%
54	373	100	85.8	85.8	1.17	1.17	26.8097%	23.0000%	23.0000%
55	479	124	110.2	110.2	1.13	1.13	25.8873%	23.0000%	23.0000%
56	511	101	117.5	117.5	0.86	0.86	19.7652%	23.0000%	23.0000%
57	583	113	134.1	134.1	0.84	0.84	19.3825%	23.0000%	23.0000%
58	648	124	149.0	149.0	0.83	0.83	19.1358%	23.0000%	23.0000%
59	702	194	175.5	196.6	1.11	0.99	27.6353%	25.0000%	28.0000%
60	4,912	1,149	1,228.0	1,129.8	0.94	1.02	23.3917%	25.0000%	23.0000%
61	3,946	655	789.2	789.2	0.83	0.83	16.5991%	20.0000%	20.0000%
62	3,369	712	842.3	673.8	0.85	1.06	21.1339%	25.0000%	20.0000%
63	2,698	469	539.6	539.6	0.87	0.87	17.3832%	20.0000%	20.0000%
64	2,280	462	456.0	456.0	1.01	1.01	20.2632%	20.0000%	20.0000%
65	1,985	522	496.3	516.1	1.05	1.01	26.2972%	25.0000%	26.0000%
66	1,386	386	346.5	360.4	1.11	1.07	27.8499%	25.0000%	26.0000%
67	946	214	212.9	246.0	1.01	0.87	22.6216%	22.5000%	26.0000%
68	748	158	168.3	168.3	0.94	0.94	21.1230%	22.5000%	22.5000%
69	549	104	123.5	123.5	0.84	0.84	18.9435%	22.5000%	22.5000%
70	408	100	91.8	91.8	1.09	1.09	24.5098%	22.5000%	22.5000%
71	298	64	59.6	59.6	1.07	1.07	21.4765%	20.0000%	20.0000%
72	235	34	47.0	47.0	0.72	0.72	14.4681%	20.0000%	20.0000%
73	165	22	33.0	33.0	0.67	0.67	13.3333%	20.0000%	20.0000%
74	133	41	26.6	26.6	1.54	1.54	30.8271%	20.0000%	20.0000%
75	95	16	19.0	19.0	0.84	0.84	16.8421%	20.0000%	20.0000%
76	80	18	16.0	16.0	1.13	1.13	22.5000%	20.0000%	20.0000%
77	51	13	10.2	10.2	1.27	1.27	25.4902%	20.0000%	20.0000%
78	38	7	7.6	7.6	0.92	0.92	18.4211%	20.0000%	20.0000%
79	32	8	6.4	6.4	1.25	1.25	25.0000%	20.0000%	20.0000%
80	23	4	23.0	23.0	0.17	0.17	17.3913%	100.0000%	100.0000%
81	17	3	17.0	17.0	0.18	0.18	17.6471%	100.0000%	100.0000%
82	15	3	15.0	15.0	0.20	0.20	20.0000%	100.0000%	100.0000%
83	13	3	13.0	13.0	0.23	0.23	23.0769%	100.0000%	100.0000%
84	7	2	7.0	7.0	0.29	0.29	28.5714%	100.0000%	100.0000%
85	5	0	5.0	5.0	0.00	0.00	0.0000%	100.0000%	100.0000%
86	5	1	5.0	5.0	0.20	0.20	20.0000%	100.0000%	100.0000%
87	1	0	1.0	1.0	0.00	0.00	0.0000%	100.0000%	100.0000%
88	2	0	2.0	2.0	0.00	0.00	0.0000%	100.0000%	100.0000%
89	1	0	1.0	1.0	0.00	0.00	0.0000%	100.0000%	100.0000%
90	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
91	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
92	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
93	1	0	1.0	1.0	0.00	0.00	0.0000%	100.0000%	100.0000%
94	1	0	1.0	1.0	0.00	0.00	0.0000%	100.0000%	100.0000%
95	1	0	1.0	1.0	0.00	0.00	0.0000%	100.0000%	100.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 7A

Calendar Years 2015 - 2019

Superannuation Retirement Experience of Active General Employees

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
96	1	0	1.0	1.0	0.00	0.00	0.0000%	100.0000%	100.0000%
97	1	0	1.0	1.0	0.00	0.00	0.0000%	100.0000%	100.0000%
98	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
99	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
100	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
101	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
102	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
103	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
104	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
105	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
106	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
107	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
108	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
109	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
110	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	27,905	5,958	6,421.6	6,242.8	0.93	0.95	21.3510%	23.0125%	22.3717%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 7A

Calendar Years 2015 - 2019

Superannuation Retirement Experience of Active General Employees

Males

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
25-29	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
30-34	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
35-39	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
40-44	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
45-49	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
50-54	209	35	44.9	31.3	0.78	1.12	16.7464%	21.5072%	15.0000%
55-59	1,893	423	494.2	426.1	0.86	0.99	22.3455%	26.1049%	22.5092%
60-64	18,582	3,589	4,158.6	3,716.4	0.86	0.97	19.3144%	22.3797%	20.0000%
65-69	7,550	1,806	1,803.4	1,893.0	1.00	0.95	23.9205%	23.8861%	25.0724%
70-74	1,927	414	400.7	400.7	1.03	1.03	21.4842%	20.7940%	20.7940%
75-79	682	130	136.4	136.4	0.95	0.95	19.0616%	20.0000%	20.0000%
80-84	162	40	162.0	162.0	0.25	0.25	24.6914%	100.0000%	100.0000%
85-89	39	12	39.0	39.0	0.31	0.31	30.7692%	100.0000%	100.0000%
90-94	3	1	3.0	3.0	0.33	0.33	33.3333%	100.0000%	100.0000%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	31,047	6,450	7,242.2	6,807.9	0.89	0.95	20.7750%	23.3266%	21.9278%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 7A

Calendar Years 2015 - 2019

Superannuation Retirement Experience of Active General Employees

Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
25-29	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
30-34	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
35-39	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
40-44	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
45-49	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
50-54	534	132	121.6	121.6	1.09	1.09	24.7191%	22.7753%	22.7753%
55-59	2,923	656	686.3	707.4	0.96	0.93	22.4427%	23.4803%	24.2008%
60-64	17,205	3,447	3,855.1	3,588.4	0.89	0.96	20.0349%	22.4066%	20.8565%
65-69	5,614	1,384	1,347.4	1,414.2	1.03	0.98	24.6527%	24.0012%	25.1914%
70-74	1,239	261	258.0	258.0	1.01	1.01	21.0654%	20.8232%	20.8232%
75-79	296	62	59.2	59.2	1.05	1.05	20.9459%	20.0000%	20.0000%
80-84	75	15	75.0	75.0	0.20	0.20	20.0000%	100.0000%	100.0000%
85-89	14	1	14.0	14.0	0.07	0.07	7.1429%	100.0000%	100.0000%
90-94	2	0	2.0	2.0	0.00	0.00	0.0000%	100.0000%	100.0000%
95-99	3	0	3.0	3.0	0.00	0.00	0.0000%	100.0000%	100.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	27,905	5,958	6,421.6	6,242.8	0.93	0.95	21.3510%	23.0125%	22.3717%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 7B

Superannuation Retirement Experience of Active General Employees

Males

Year	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	6,467	1,359	1,506.7	1,408.3	0.90	0.96	21.0144%	23.2988%	21.7773%
2016	6,318	1,359	1,472.3	1,380.4	0.92	0.98	21.5100%	23.3039%	21.8479%
2017	6,318	1,193	1,472.3	1,380.4	0.81	0.86	18.8826%	23.3039%	21.8479%
2018	6,061	1,243	1,412.7	1,334.7	0.88	0.93	20.5082%	23.3074%	22.0205%
2019	5,883	1,296	1,378.1	1,304.2	0.94	0.99	22.0296%	23.4258%	22.1692%
<i>Total</i>	<i>31,047</i>	<i>6,450</i>	<i>7,242.2</i>	<i>6,807.9</i>	<i>0.89</i>	<i>0.95</i>	<i>20.7750%</i>	<i>23.3266%</i>	<i>21.9278%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 7B

Superannuation Retirement Experience of Active General Employees

Females

Year	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	5,745	1,245	1,317.9	1,277.8	0.94	0.97	21.6710%	22.9399%	22.2417%
2016	5,682	1,189	1,308.9	1,270.3	0.91	0.94	20.9257%	23.0351%	22.3572%
2017	5,607	1,152	1,292.8	1,255.3	0.89	0.92	20.5457%	23.0577%	22.3882%
2018	5,533	1,202	1,271.7	1,241.1	0.95	0.97	21.7242%	22.9840%	22.4301%
2019	5,338	1,170	1,230.3	1,198.3	0.95	0.98	21.9183%	23.0484%	22.4490%
Total	27,905	5,958	6,421.6	6,242.8	0.93	0.95	21.3510%	23.0125%	22.3717%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 7C

Superannuation Retirement Experience of Active General Employees

Males and Females

Year	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	12,212	2,604	2,825.0	2,686.1	0.92	0.97	21.3233%	23.1330%	21.9958%
2016	12,000	2,548	2,781.0	2,650.7	0.92	0.96	21.2333%	23.1750%	22.0890%
2017	11,925	2,345	2,765.0	2,635.7	0.85	0.89	19.6646%	23.1866%	22.1019%
2018	11,594	2,445	2,684.0	2,575.7	0.91	0.95	21.0885%	23.1499%	22.2160%
2019	11,221	2,466	2,608.0	2,502.5	0.95	0.99	21.9767%	23.2421%	22.3023%
<i>Total</i>	<i>58,952</i>	<i>12,408</i>	<i>13,663.0</i>	<i>13,050.7</i>	<i>0.91</i>	<i>0.95</i>	<i>21.0476%</i>	<i>23.1765%</i>	<i>22.1379%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 8A

Calendar Years 2015 - 2019

Withdrawal Experience of Active General Employees

Males

Age	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
17	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
18	18	5	4.4	5.4	1.15	0.93	27.7778%	24.2000%	30.0000%
19	145	43	33.9	41.8	1.27	1.03	29.6552%	23.3662%	28.8000%
20	341	95	74.2	90.8	1.28	1.05	27.8592%	21.7662%	26.6211%
21	590	146	117.4	143.9	1.24	1.01	24.7458%	19.8978%	24.3875%
22	863	210	159.0	197.3	1.32	1.06	24.3337%	18.4274%	22.8569%
23	1,277	265	222.1	277.3	1.19	0.96	20.7518%	17.3920%	21.7126%
24	1,725	322	259.7	323.9	1.24	0.99	18.6667%	15.0526%	18.7773%
25	1,987	337	253.4	308.7	1.33	1.09	16.9602%	12.7508%	15.5373%
26	2,311	319	263.2	328.5	1.21	0.97	13.8035%	11.3896%	14.2129%
27	2,668	340	270.3	327.9	1.26	1.04	12.7436%	10.1307%	12.2884%
28	2,929	291	266.7	311.2	1.09	0.94	9.9351%	9.1053%	10.6256%
29	3,090	277	245.9	283.4	1.13	0.98	8.9644%	7.9592%	9.1719%
30	3,392	281	227.4	273.4	1.24	1.03	8.2842%	6.7032%	8.0594%
31	3,526	273	218.9	288.1	1.25	0.95	7.7425%	6.2090%	8.1721%
32	3,603	262	207.8	275.7	1.26	0.95	7.2717%	5.7663%	7.6522%
33	3,734	241	185.8	232.7	1.30	1.04	6.4542%	4.9772%	6.2311%
34	3,739	201	178.0	222.1	1.13	0.90	5.3758%	4.7609%	5.9402%
35	3,795	197	172.0	219.6	1.15	0.90	5.1910%	4.5321%	5.7867%
36	3,774	202	166.5	195.9	1.21	1.03	5.3524%	4.4112%	5.1905%
37	3,684	176	156.7	180.4	1.12	0.98	4.7774%	4.2543%	4.8971%
38	3,505	176	151.3	168.9	1.16	1.04	5.0214%	4.3168%	4.8179%
39	3,331	162	143.8	169.3	1.13	0.96	4.8634%	4.3180%	5.0812%
40	3,202	161	136.9	162.3	1.18	0.99	5.0281%	4.2770%	5.0687%
41	3,074	146	127.3	153.0	1.15	0.95	4.7495%	4.1399%	4.9779%
42	3,063	162	126.0	147.9	1.29	1.10	5.2889%	4.1139%	4.8280%
43	3,085	154	125.2	147.7	1.23	1.04	4.9919%	4.0593%	4.7873%
44	3,123	139	125.4	147.5	1.11	0.94	4.4508%	4.0157%	4.7233%
45	3,150	164	120.6	156.3	1.36	1.05	5.2063%	3.8289%	4.9629%
46	3,174	152	122.4	158.2	1.24	0.96	4.7889%	3.8549%	4.9842%
47	3,108	150	120.9	150.5	1.24	1.00	4.8263%	3.8910%	4.8409%
48	3,043	144	115.6	140.7	1.25	1.02	4.7322%	3.7989%	4.6239%
49	2,985	139	114.7	143.6	1.21	0.97	4.6566%	3.8435%	4.8100%
50	2,991	143	113.2	139.9	1.26	1.02	4.7810%	3.7834%	4.6765%
51	2,963	142	115.6	147.0	1.23	0.97	4.7924%	3.9017%	4.9599%
52	3,075	158	119.2	151.2	1.33	1.04	5.1382%	3.8768%	4.9173%
53	3,118	175	119.6	156.7	1.46	1.12	5.6126%	3.8364%	5.0267%
54	3,115	141	115.1	145.7	1.22	0.97	4.5265%	3.6954%	4.6781%
55	3,039	132	105.1	126.7	1.26	1.04	4.3435%	3.4596%	4.1690%
56	3,030	138	104.8	127.8	1.32	1.08	4.5545%	3.4598%	4.2185%
57	2,908	95	94.3	113.6	1.01	0.84	3.2669%	3.2415%	3.9081%
58	2,912	109	95.0	115.1	1.15	0.95	3.7431%	3.2624%	3.9541%
59	2,885	119	92.5	112.7	1.29	1.06	4.1248%	3.2056%	3.9074%
60	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	115,070	7,684	6,287.9	7,710.2	1.22	1.00	6.6777%	5.4644%	6.7004%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 8A

Calendar Years 2015 - 2019

Withdrawal Experience of Active General Employees

Females

Age	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
17	1	0	0.3	0.4	0.00	0.00	0.0000%	28.3800%	40.0200%
18	22	12	6.1	8.7	1.96	1.38	54.5455%	27.8132%	39.4377%
19	157	75	43.4	61.6	1.73	1.22	47.7707%	27.6338%	39.2075%
20	395	151	98.8	143.5	1.53	1.05	38.2278%	25.0079%	36.3346%
21	689	223	158.2	231.4	1.41	0.96	32.3657%	22.9625%	33.5847%
22	924	279	191.4	281.5	1.46	0.99	30.1948%	20.7094%	30.4692%
23	1,419	378	247.7	361.9	1.53	1.04	26.6385%	17.4548%	25.5038%
24	1,837	401	299.8	406.3	1.34	0.99	21.8291%	16.3210%	22.1193%
25	2,170	404	326.5	392.8	1.24	1.03	18.6175%	15.0480%	18.1027%
26	2,494	402	322.7	397.4	1.25	1.01	16.1187%	12.9385%	15.9334%
27	2,727	388	324.5	407.6	1.20	0.95	14.2281%	11.9006%	14.9462%
28	2,975	376	286.4	361.3	1.31	1.04	12.6387%	9.6273%	12.1435%
29	3,116	317	274.0	350.4	1.16	0.90	10.1733%	8.7924%	11.2452%
30	3,279	339	265.7	332.2	1.28	1.02	10.3385%	8.1018%	10.1301%
31	3,417	315	240.4	317.5	1.31	0.99	9.2186%	7.0341%	9.2911%
32	3,664	290	237.2	290.0	1.22	1.00	7.9148%	6.4726%	7.9145%
33	3,828	254	227.6	271.7	1.12	0.93	6.6353%	5.9445%	7.0990%
34	3,904	245	210.4	236.7	1.16	1.04	6.2756%	5.3890%	6.0633%
35	3,894	193	201.1	226.6	0.96	0.85	4.9563%	5.1656%	5.8189%
36	3,952	226	200.9	225.3	1.13	1.00	5.7186%	5.0830%	5.7005%
37	3,848	251	193.0	220.7	1.30	1.14	6.5229%	5.0163%	5.7351%
38	3,672	208	177.1	197.7	1.17	1.05	5.6645%	4.8239%	5.3835%
39	3,535	175	172.4	195.8	1.02	0.89	4.9505%	4.8757%	5.5399%
40	3,421	190	154.5	187.8	1.23	1.01	5.5539%	4.5170%	5.4910%
41	3,277	190	147.2	179.1	1.29	1.06	5.7980%	4.4927%	5.4666%
42	3,214	162	142.3	170.6	1.14	0.95	5.0404%	4.4288%	5.3087%
43	3,220	174	133.7	157.7	1.30	1.10	5.4037%	4.1523%	4.8986%
44	3,279	154	137.0	168.2	1.12	0.92	4.6966%	4.1769%	5.1309%
45	3,361	162	140.8	172.5	1.15	0.94	4.8200%	4.1891%	5.1318%
46	3,416	169	137.5	169.9	1.23	0.99	4.9473%	4.0258%	4.9736%
47	3,413	173	138.9	172.1	1.25	1.01	5.0689%	4.0711%	5.0417%
48	3,425	177	137.0	170.4	1.29	1.04	5.1679%	4.0010%	4.9740%
49	3,392	194	137.6	185.5	1.41	1.05	5.7193%	4.0561%	5.4685%
50	3,371	172	133.9	171.8	1.28	1.00	5.1023%	3.9720%	5.0968%
51	3,363	145	126.2	161.0	1.15	0.90	4.3116%	3.7538%	4.7886%
52	3,406	161	123.4	159.3	1.31	1.01	4.7270%	3.6222%	4.6772%
53	3,438	168	123.7	158.4	1.36	1.06	4.8866%	3.5988%	4.6072%
54	3,425	139	118.9	149.6	1.17	0.93	4.0584%	3.4714%	4.3692%
55	3,311	151	113.6	141.5	1.33	1.07	4.5606%	3.4305%	4.2741%
56	3,254	148	110.0	131.2	1.35	1.13	4.5482%	3.3797%	4.0331%
57	3,238	114	107.4	127.7	1.06	0.89	3.5207%	3.3177%	3.9446%
58	3,170	131	104.5	125.0	1.25	1.05	4.1325%	3.2970%	3.9423%
59	2,969	113	94.5	112.5	1.20	1.00	3.8060%	3.1822%	3.7879%
60	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	122,282	9,089	7,268.2	9,090.9	1.25	1.00	7.4328%	5.9438%	7.4344%

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 8A **Calendar Years 2015 - 2019**
Withdrawal Experience of Active General Employees **Males**

Age	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	4,959	1,086	870.6	1,080.3	1.25	1.01	21.8996%	17.5567%	21.7838%
25-29	12,985	1,564	1,299.5	1,559.7	1.20	1.00	12.0447%	10.0076%	12.0114%
30-34	17,994	1,258	1,017.9	1,292.0	1.24	0.97	6.9912%	5.6570%	7.1802%
35-39	18,089	913	790.3	934.0	1.16	0.98	5.0473%	4.3692%	5.1635%
40-44	15,547	762	640.9	758.4	1.19	1.00	4.9013%	4.1221%	4.8781%
45-49	15,460	749	594.2	749.3	1.26	1.00	4.8448%	3.8436%	4.8465%
50-54	15,262	759	582.7	740.5	1.30	1.02	4.9731%	3.8181%	4.8519%
55-59	14,774	593	491.7	596.0	1.21	0.99	4.0138%	3.3283%	4.0344%
60-64	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65-69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70-74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75-79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80-84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85-89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90-94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
<i>Total</i>	<i>115,070</i>	<i>7,684</i>	<i>6,287.9</i>	<i>7,710.2</i>	<i>1.22</i>	<i>1.00</i>	<i>6.6777%</i>	<i>5.4644%</i>	<i>6.7004%</i>

COMMONWEALTH OF PENNSYLVANIA
State Employees' Retirement System

Table 8A **Calendar Years 2015 - 2019**
Withdrawal Experience of Active General Employees **Females**

Age	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
<25	5,444	1,519	1,045.6	1,495.3	1.45	1.02	27.9023%	19.2071%	27.4673%
25-29	13,482	1,887	1,534.1	1,909.5	1.23	0.99	13.9964%	11.3792%	14.1630%
30-34	18,092	1,443	1,181.1	1,448.1	1.22	1.00	7.9759%	6.5284%	8.0040%
35-39	18,901	1,053	944.5	1,066.1	1.11	0.99	5.5711%	4.9973%	5.6403%
40-44	16,411	870	714.8	863.6	1.22	1.01	5.3013%	4.3554%	5.2622%
45-49	17,007	875	691.9	870.3	1.26	1.01	5.1449%	4.0682%	5.1173%
50-54	17,003	785	626.1	800.2	1.25	0.98	4.6168%	3.6825%	4.7062%
55-59	15,942	657	530.0	637.9	1.24	1.03	4.1212%	3.3244%	4.0014%
60-64	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
65-69	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
70-74	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
75-79	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
80-84	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
85-89	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
90-94	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
95-99	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
100 and over	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	122,282	9,089	7,268.2	9,090.9	1.25	1.00	7.4328%	5.9438%	7.4344%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 8B

Withdrawal Experience of Active General Employees

Males

Year	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	23,557	1,360	1,250.2	1,534.0	1.09	0.89	5.7732%	5.3071%	6.5119%
2016	23,491	1,542	1,295.3	1,587.2	1.19	0.97	6.5642%	5.5142%	6.7568%
2017	23,335	1,651	1,297.9	1,585.3	1.27	1.04	7.0752%	5.5622%	6.7937%
2018	22,412	1,598	1,206.1	1,482.1	1.32	1.08	7.1301%	5.3813%	6.6129%
2019	22,275	1,533	1,238.4	1,521.5	1.24	1.01	6.8822%	5.5594%	6.8307%
<i>Total</i>	<i>115,070</i>	<i>7,684</i>	<i>6,287.9</i>	<i>7,710.2</i>	<i>1.22</i>	<i>1.00</i>	<i>6.6777%</i>	<i>5.4644%</i>	<i>6.7004%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 8B

Withdrawal Experience of Active General Employees

Females

Year	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
2015	24,697	1,463	1,408.7	1,766.2	1.04	0.83	5.9238%	5.7039%	7.1514%
2016	25,040	1,825	1,503.9	1,878.0	1.21	0.97	7.2883%	6.0061%	7.5002%
2017	24,791	1,942	1,501.8	1,874.7	1.29	1.04	7.8335%	6.0578%	7.5622%
2018	23,914	1,971	1,422.4	1,777.2	1.39	1.11	8.2420%	5.9482%	7.4316%
2019	23,840	1,888	1,431.3	1,794.8	1.32	1.05	7.9195%	6.0040%	7.5285%
Total	122,282	9,089	7,268.2	9,090.9	1.25	1.00	7.4328%	5.9438%	7.4344%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 9A

Calendar Years 2015 - 2019

Withdrawal Experience of Judicial Officers

Males and Females

Service	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
0	208	7	2.1	6.2	3.37	1.12	3.3654%	1.0000%	3.0000%
1	176	6	1.8	5.3	3.41	1.14	3.4091%	1.0000%	3.0000%
2	218	1	0.7	0.9	1.53	1.15	0.4587%	0.3000%	0.4000%
3	132	1	0.4	0.5	2.53	1.89	0.7576%	0.3000%	0.4000%
4	153	2	0.5	0.6	4.36	3.27	1.3072%	0.3000%	0.4000%
5	150	0	0.5	0.6	0.00	0.00	0.0000%	0.3000%	0.4000%
6	143	1	0.4	0.6	2.33	1.75	0.6993%	0.3000%	0.4000%
7	114	0	0.3	0.5	0.00	0.00	0.0000%	0.3000%	0.4000%
8	130	0	0.4	0.5	0.00	0.00	0.0000%	0.3000%	0.4000%
9	112	0	0.3	0.4	0.00	0.00	0.0000%	0.3000%	0.4000%
10	1,149	2	3.4	4.6	0.58	0.44	0.1741%	0.3000%	0.4000%
Total	2,685	20	10.7	20.7	1.86	0.97	0.7449%	0.4001%	0.7718%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 9B

Calendar Years 2015 - 2019

Super Annuation Retirement Experience of Judicial Officers

Males and Females

Service	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
49	0	0	0.0	0.0	0.00	0.00	0.0000%	5.0000%	5.0000%
50	0	0	0.0	0.0	0.00	0.00	0.0000%	5.0000%	5.0000%
51	0	0	0.0	0.0	0.00	0.00	0.0000%	5.0000%	5.0000%
52	0	0	0.0	0.0	0.00	0.00	0.0000%	5.0000%	5.0000%
53	0	0	0.0	0.0	0.00	0.00	0.0000%	5.0000%	5.0000%
54	0	0	0.0	0.0	0.00	0.00	0.0000%	5.0000%	5.0000%
55	1	0	0.1	0.1	0.00	0.00	0.0000%	5.0000%	5.0000%
56	3	0	0.2	0.2	0.00	0.00	0.0000%	5.0000%	5.0000%
57	6	0	0.3	0.3	0.00	0.00	0.0000%	5.0000%	5.0000%
58	10	0	0.5	0.5	0.00	0.00	0.0000%	5.0000%	5.0000%
59	13	1	0.7	0.7	1.54	1.54	7.6923%	5.0000%	5.0000%
60	233	11	11.7	11.7	0.94	0.94	4.7210%	5.0000%	5.0000%
61	262	8	13.1	13.1	0.61	0.61	3.0534%	5.0000%	5.0000%
62	252	13	12.6	12.6	1.03	1.03	5.1587%	5.0000%	5.0000%
63	251	17	12.6	12.6	1.35	1.35	6.7729%	5.0000%	5.0000%
64	233	12	11.7	11.7	1.03	1.03	5.1502%	5.0000%	5.0000%
65	225	26	22.5	22.5	1.16	1.16	11.5556%	10.0000%	10.0000%
66	184	14	18.4	18.4	0.76	0.76	7.6087%	10.0000%	10.0000%
67	173	21	17.3	17.3	1.21	1.21	12.1387%	10.0000%	10.0000%
68	157	19	15.7	15.7	1.21	1.21	12.1019%	10.0000%	10.0000%
69	130	26	13.0	26.0	2.00	1.00	20.0000%	10.0000%	20.0000%
70	83	20	83.0	20.8	0.24	0.96	24.0964%	100.0000%	25.0000%
71	43	1	43.0	8.6	0.02	0.12	2.3256%	100.0000%	20.0000%
72	23	0	23.0	4.6	0.00	0.00	0.0000%	100.0000%	20.0000%
73	1	0	1.0	0.2	0.00	0.00	0.0000%	100.0000%	20.0000%
74	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	20.0000%
75	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
76	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
77	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
78	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
79	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
80	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	2,283	189	300.1	197.3	0.63	0.96	8.2786%	13.1450%	8.6399%

Table 9B

Calendar Years 2015 - 2019

Early Retirement Experience of Judicial Officers

Males and Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
17 to 49	486	4	1.0	4.9	4.12	0.82	0.8230%	0.2000%	1.0000%
50 to 59	1279	13	23.0	12.8	0.56	1.02	1.0164%	1.8000%	1.0000%
Total	1,765	17	24.0	17.6	0.71	0.96	0.9632%	1.3594%	1.0000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 10A

Calendar Years 2015 - 2019

Withdrawal Experience of Legislators

Males and Females

Service	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
0	71	3	2.8	2.8	1.06	1.06	4.2254%	4.0000%	4.0000%
1	44	0	1.8	1.8	0.00	0.00	0.0000%	4.0000%	4.0000%
2	47	3	1.9	1.9	1.60	1.60	6.3830%	4.0000%	4.0000%
3	26	3	1.0	1.0	2.88	2.88	11.5385%	4.0000%	4.0000%
4	36	0	1.4	1.4	0.00	0.00	0.0000%	4.0000%	4.0000%
5	33	0	1.3	1.3	0.00	0.00	0.0000%	4.0000%	4.0000%
6	29	2	1.2	1.2	1.72	1.72	6.8966%	4.0000%	4.0000%
7	19	1	2.3	0.8	0.44	1.32	5.2632%	12.0000%	4.0000%
8	33	0	4.0	1.3	0.00	0.00	0.0000%	12.0000%	4.0000%
9	22	1	2.6	0.9	0.38	1.14	4.5455%	12.0000%	4.0000%
10	96	4	1.5	3.8	2.60	1.04	4.1667%	1.6000%	4.0000%
<i>Total</i>	<i>456</i>	<i>17</i>	<i>21.9</i>	<i>18.2</i>	<i>0.78</i>	<i>0.93</i>	<i>3.7281%</i>	<i>4.7930%</i>	<i>4.0000%</i>

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 10B

Calendar Years 2015 - 2019

Super Annuation Retirement Experience of Legislators

Males and Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
49	0	0	0.0	0.0	0.00	0.00	0.0000%	5.0000%	7.0000%
50	19	0	1.0	1.3	0.00	0.00	0.0000%	5.0000%	7.0000%
51	21	3	1.1	1.5	2.86	2.04	14.2857%	5.0000%	7.0000%
52	17	1	0.9	1.2	1.18	0.84	5.8824%	5.0000%	7.0000%
53	18	1	0.9	1.3	1.11	0.79	5.5556%	5.0000%	7.0000%
54	21	0	1.1	1.5	0.00	0.00	0.0000%	5.0000%	7.0000%
55	31	3	1.6	2.2	1.94	1.38	9.6774%	5.0000%	7.0000%
56	31	0	1.6	2.2	0.00	0.00	0.0000%	5.0000%	7.0000%
57	33	0	1.7	2.3	0.00	0.00	0.0000%	5.0000%	7.0000%
58	34	2	1.7	2.4	1.18	0.84	5.8824%	5.0000%	7.0000%
59	34	4	1.7	2.4	2.35	1.68	11.7647%	5.0000%	7.0000%
60	33	3	1.7	2.3	1.82	1.30	9.0909%	5.0000%	7.0000%
61	32	4	1.6	2.2	2.50	1.79	12.5000%	5.0000%	7.0000%
62	27	2	1.4	1.9	1.48	1.06	7.4074%	5.0000%	7.0000%
63	25	1	2.8	2.8	0.36	0.36	4.0000%	11.0000%	11.0000%
64	26	3	2.9	2.9	1.05	1.05	11.5385%	11.0000%	11.0000%
65	27	6	3.0	3.0	2.02	2.02	22.2222%	11.0000%	11.0000%
66	18	2	2.0	2.0	1.01	1.01	11.1111%	11.0000%	11.0000%
67	19	1	2.1	2.1	0.48	0.48	5.2632%	11.0000%	11.0000%
68	20	3	2.2	2.2	1.36	1.36	15.0000%	11.0000%	11.0000%
69	21	2	2.3	2.3	0.87	0.87	9.5238%	11.0000%	11.0000%
70	19	3	2.9	1.7	1.05	1.75	15.7895%	15.0000%	9.0000%
71	12	1	1.8	1.1	0.56	0.93	8.3333%	15.0000%	9.0000%
72	14	1	2.1	1.3	0.48	0.79	7.1429%	15.0000%	9.0000%
73	12	0	1.8	1.1	0.00	0.00	0.0000%	15.0000%	9.0000%
74	8	0	1.2	0.7	0.00	0.00	0.0000%	15.0000%	9.0000%
75	6	0	0.9	0.5	0.00	0.00	0.0000%	15.0000%	9.0000%
76	5	0	0.8	0.5	0.00	0.00	0.0000%	15.0000%	9.0000%
77	3	1	0.5	0.3	2.22	3.70	33.3333%	15.0000%	9.0000%
78	2	1	0.3	0.2	3.33	5.56	50.0000%	15.0000%	9.0000%
79	2	0	0.3	0.2	0.00	0.00	0.0000%	15.0000%	9.0000%
80	2	1	2.0	2.0	0.50	0.50	50.0000%	100.0000%	100.0000%
Total	592	49	49.2	51.2	1.00	0.96	8.2770%	8.3041%	8.6486%

Table 10B

Calendar Years 2015 - 2019

Early Retirement Experience of Legislators

Males and Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
17 to 49	173	5	4.7	5.0	1.07	1.00	2.8902%	2.7000%	2.9000%
50 to 59	0	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	173	5	4.7	5.0	1.07	1.00	2.8902%	2.7000%	2.9000%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 11A

Calendar Years 2015 - 2019

Withdrawal Experience of State Police and Hazardous Duty Employees

Males and Females

Service	Life Years Exposed	Number of Withdrawals			Ratio of Actual to		Withdrawal Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
0	7,385	687	664.7	664.7	1.03	1.03	9.3026%	9.0000%	9.0000%
1	6,221	288	248.8	311.1	1.16	0.93	4.6295%	4.0000%	5.0000%
2	5,822	186	174.7	174.7	1.06	1.06	3.1948%	3.0000%	3.0000%
3	4,570	149	137.1	137.1	1.09	1.09	3.2604%	3.0000%	3.0000%
4	3,776	78	75.5	75.5	1.03	1.03	2.0657%	2.0000%	2.0000%
5	3,424	61	34.2	68.5	1.78	0.89	1.7815%	1.0000%	2.0000%
6	3,529	52	35.3	35.3	1.47	1.47	1.4735%	1.0000%	1.0000%
7	3,716	16	18.6	20.4	0.86	0.78	0.4306%	0.5000%	0.5500%
8	3,744	24	18.7	20.6	1.28	1.17	0.6410%	0.5000%	0.5500%
9	4,067	22	20.3	22.4	1.08	0.98	0.5409%	0.5000%	0.5500%
10	31,649	93	63.3	94.9	1.47	0.98	0.2938%	0.2000%	0.3000%
Total	77,903	1,656	1,491.2	1,625.1	1.11	1.02	2.1257%	1.9142%	2.0860%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 11B

Calendar Years 2015 - 2019

Super Annuation Retirement Experience of Hazardous Duty Employees

Males and Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
49	0	0	0	0.0	0.00	0.00	0.0000%	10.0000%	10.0000%
50	2,620	418	262	393.0	1.60	1.06	15.9542%	10.0000%	15.0000%
51	2,254	213	225	225.4	0.94	0.94	9.4499%	10.0000%	10.0000%
52	2,062	190	206	206.2	0.92	0.92	9.2144%	10.0000%	10.0000%
53	1,855	145	186	185.5	0.78	0.78	7.8167%	10.0000%	10.0000%
54	1,769	167	177	176.9	0.94	0.94	9.4404%	10.0000%	10.0000%
55	1,696	207	170	203.5	1.22	1.02	12.2052%	10.0000%	12.0000%
56	1,490	145	149	149.0	0.97	0.97	9.7315%	10.0000%	10.0000%
57	1,319	121	132	131.9	0.92	0.92	9.1736%	10.0000%	10.0000%
58	1,250	113	125	125.0	0.90	0.90	9.0400%	10.0000%	10.0000%
59	1,105	140	111	132.6	1.27	1.06	12.6697%	10.0000%	12.0000%
60	1,010	144	192	161.6	0.75	0.89	14.2574%	19.0000%	16.0000%
61	886	155	168	141.8	0.92	1.09	17.4944%	19.0000%	16.0000%
62	745	154	142	149.0	1.09	1.03	20.6711%	19.0000%	20.0000%
63	588	110	112	117.6	0.98	0.94	18.7075%	19.0000%	20.0000%
64	483	99	92	96.6	1.08	1.02	20.4969%	19.0000%	20.0000%
65	375	87	101	86.2	0.86	1.01	23.2000%	27.0000%	23.0000%
66	291	91	79	87.3	1.16	1.04	31.2715%	27.0000%	30.0000%
67	190	50	51	47.5	0.97	1.05	26.3158%	27.0000%	25.0000%
68	140	33	38	35.0	0.87	0.94	23.5714%	27.0000%	25.0000%
69	100	23	27	20.0	0.85	1.15	23.0000%	27.0000%	20.0000%
70	72	14	19	14.4	0.72	0.97	19.4444%	27.0000%	20.0000%
71	48	8	15	9.6	0.52	0.83	16.6667%	32.0000%	20.0000%
72	35	9	11	7.0	0.80	1.29	25.7143%	32.0000%	20.0000%
73	24	4	8	4.8	0.52	0.83	16.6667%	32.0000%	20.0000%
74	18	3	6	3.6	0.52	0.83	16.6667%	32.0000%	20.0000%
75	11	1	4	2.2	0.28	0.45	9.0909%	32.0000%	20.0000%
76	6	0	2	1.2	0.00	0.00	0.0000%	32.0000%	20.0000%
77	3	1	1	0.6	1.04	1.67	33.3333%	32.0000%	20.0000%
78	1	0	0	0.2	0.00	0.00	0.0000%	32.0000%	20.0000%
79	0	0	0.0	0.0	0.00	0.00	0.0000%	32.0000%	20.0000%
80	0	0	0.0	0.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	22,446	2,845	2,809.4	2,915.2	1.01	0.98	12.6749%	12.5161%	12.9877%

Table 11B

Calendar Years 2015 - 2019

Early Retirement Experience of State Police and Hazardous Duty Employees

Males and Females

Age	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
17 to 49	46591	722	652.3	698.9	1.11	1.03	1.5497%	1.4000%	1.5000%
50 to 59	19	0	0.0	0.0	0.00	0.00	0.0000%	0.0000%	0.0000%
Total	46,610	722	652.3	698.9	1.11	1.03	1.5490%	1.3994%	1.4994%

COMMONWEALTH OF PENNSYLVANIA

State Employees' Retirement System

Table 12A

Calendar Years 2015 - 2019

Super Annuation Retirement Experience of State Police

Males and Females

Service	Life Years Exposed	Number of Retirements			Ratio of Actual to		Retirement Rate		
		Actual	Expected	Recommended	Expected	Recommended	Actual	Expected	Recommended
19	752	39	30.1	37.6	1.30	1.04	5.1862%	4.0000%	5.0000%
20	774	68	7.7	58.1	8.79	1.17	8.7855%	1.0000%	7.5000%
21	799	53	8.0	59.9	6.63	0.88	6.6333%	1.0000%	7.5000%
22	938	33	9.4	70.4	3.52	0.47	3.5181%	1.0000%	7.5000%
23	1,082	123	10.8	81.2	11.37	1.52	11.3678%	1.0000%	7.5000%
24	976	616	488.0	585.6	1.26	1.05	63.1148%	50.0000%	60.0000%
25	321	143	224.7	192.6	0.64	0.74	44.5483%	70.0000%	60.0000%
26	189	53	75.6	47.3	0.70	1.12	28.0423%	40.0000%	25.0000%
27	136	34	54.4	34.0	0.63	1.00	25.0000%	40.0000%	25.0000%
28	92	19	36.8	23.0	0.52	0.83	20.6522%	40.0000%	25.0000%
29	69	17	27.6	17.3	0.62	0.99	24.6377%	40.0000%	25.0000%
30	61	15	30.5	15.3	0.49	0.98	24.5902%	50.0000%	25.0000%
31	43	11	17.2	10.8	0.64	1.02	25.5814%	40.0000%	25.0000%
32	34	7	13.6	8.5	0.51	0.82	20.5882%	40.0000%	25.0000%
33	27	5	13.5	6.8	0.37	0.74	18.5185%	50.0000%	25.0000%
34	17	4	8.5	4.3	0.47	0.94	23.5294%	50.0000%	25.0000%
35	10	3	5.0	2.5	0.60	1.20	30.0000%	50.0000%	25.0000%
36	4	1	2.0	1.6	0.50	0.63	25.0000%	50.0000%	40.0000%
37	3	2	1.5	1.2	1.33	1.67	66.6667%	50.0000%	40.0000%
38	1	0	0.5	0.4	0.00	0.00	0.0000%	50.0000%	40.0000%
39	2	1	1.0	0.8	1.00	1.25	50.0000%	50.0000%	40.0000%
40	1	0	1.0	1.0	0.00	0.00	0.0000%	100.0000%	100.0000%
Total	6,331	1,247	1,067.4	1,259.8	1.17	0.99	19.6967%	16.8601%	19.8985%

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