SERS EXPERIENCE STUDY

20th Investigation of Actuarial Experience

January 1, 2020 to December 31, 2024

July 22, 2025 Finance & Member Services Committee Meeting

KORN FERRY®

Agenda

01

Purpose of the Experience Study

Purpose of the Experience Study

- A periodic review of **actual vs expected** actuarial experience is essential if a retirement system is to be financed on a sound basis. The Commonwealth has formally recognized this need in the State Employees' Retirement Code.
- This is the twentieth in a series of investigations of actuarial experience that we have performed for the State Employees' Retirement System (SERS).
- This study is based upon **economic** and **demographic** experience from January 1, 2020 through December 31, 2024.
- The study reviewed the experience and developed recommended assumptions for use in the upcoming (December 31, 2025) and subsequent valuations.
- This presentation provides an overview of our key study results to date. More detailed results and support for Korn Ferry's recommended changes to the actuarial valuation assumptions will be provided in our actuarial experience study report, which will be published in September.

02

Economic Assumptions

Economic Assumptions

- There are three Economic Assumptions:
  - Inflation rate assumption
  - Investment return assumption (Assumed Rate of Return)
  - Salary growth assumptions
- Real Rate of Investment Return (and Real Rate of Salary Growth) is derived by dividing the Nominal Rate by the Rate of Inflation. Example: Current Real Investment Return is [1.06875 / 1.025] – 1.0, which is approximately 4.3%

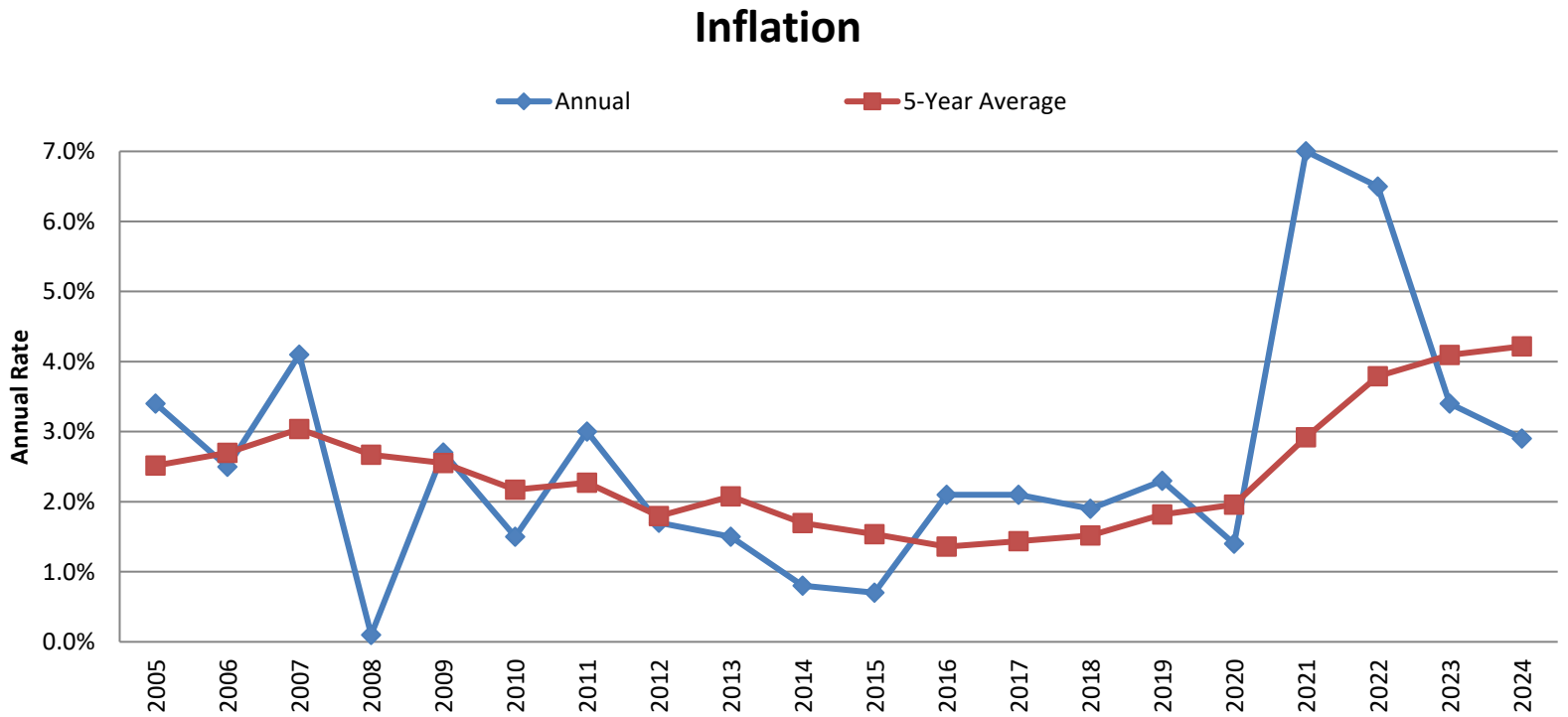
Current & Recent Economic Assumptions					
	Inflation	Investment Return		Salary Growth	
		Nominal	Real	Nominal	Real
Last 2 Years 2023 – 2024	2.50%	6.875%	4.3%	2.80%	0.3%
Prior 2 Years 2021 – 2022	2.50%	7.00%	4.4%	2.80%	0.3%
Prior 1 Year 2020	2.60%	7.125%	4.4%	2.90%	0.3%

SERS 20-Year History – Actual Annual Rates of Growth

Year	Actual Inflation	Actual Investment Return		Actual Salary Growth	
		Nominal	Real	Nominal	Real
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
2020	1.4	11.1	9.6	4.9	3.5
2021	7.0	17.2	9.5	3.7	(3.1)
2022	6.5	(12.1)	(17.5)	4.1	(2.3)
2023	3.4	12.2	8.5	4.1	0.7
2024	2.9	9.8	6.7	4.8	1.8
Averages					
2020-2024 (5 years)	**4.2**	**7.1**	**2.8**	**4.3**	**0.1**
2015-2024 (10 years)	**3.0**	**7.0**	**3.9**	**4.2**	**1.1**
2010-2024 (15 years)	**2.6**	**7.7**	**5.0**	**3.7**	**1.0**
2005-2024 (20 years)	**2.6**	**6.8**	**4.1**	**3.5**	**0.9**

Inflation Rate Assumption

- While the inflation rate is not used directly in the valuation, it is a component of both the investment return assumption and the salary increase assumption.
- Over the past 20 years, the annual inflation rate has ranged from a low of 0.1% to a high of 7.0%, whereas the rolling 5-year average has ranged only between 1.4% and 4.2%.

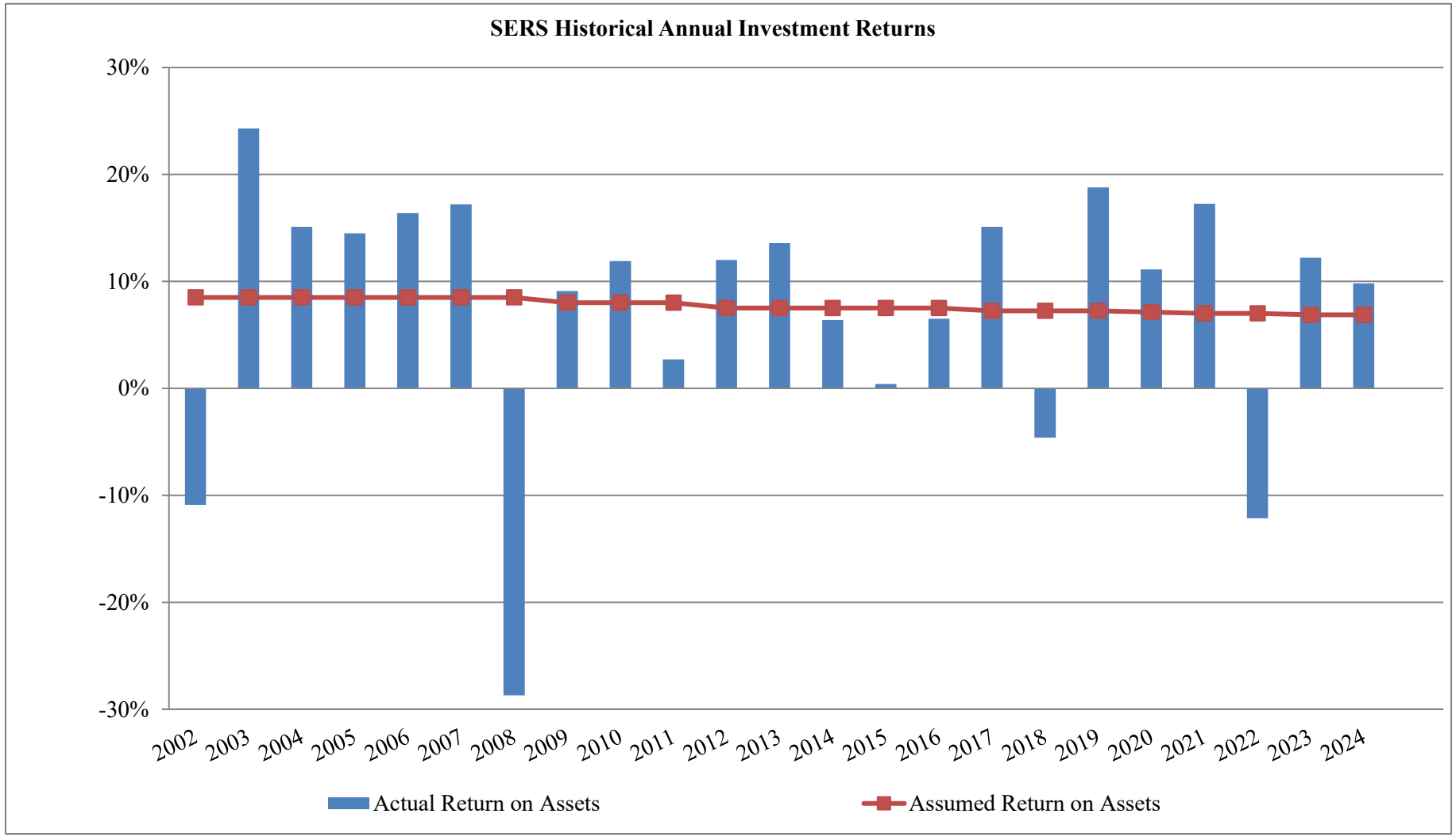


Inflation Rate & Salary Growth Assumptions – Current Vs Recommended

- Korn Ferry recommends that the Board retain SERS' annual inflation assumption of 2.50%. This is consistent with the Social Security Administration which has not changed its 2.4% intermediate assumption from 2020 to 2025 in the Trustees' Reports.

- The inflation assumption affects both the Investment Return Assumption and General Salary Growth Assumption (the general "across-the-board" increases related to inflation and real wage growth).

Investment Return Assumption – Recent History of Actual Vs Assumed



Investment Return Assumptions Used By Largest U.S. Public Retirement Systems from NASRA

- Highlighted cells in table below include SERS return assumption; median assumption is currently 7.00%

Assumed Return	# of Retirement Systems									
	Feb 2016	Feb 2017	Feb 2018	Feb 2019	Jun 2020	May 2021	May 2022	May 2023	April 2024	April 2025
>8.00%	4	3	1	0	0	0	0	0	0	0
7.76-8.00%	41	26	11	6	3	2	0	0	0	0
7.51%-7.75%	22	26	24	14	8	6	2	1	0	0
7.26%-7.50%	36	34	37	42	40	38	22	13	9	9
7.01%-7.25%	11	18	26	23	24	19	20	24	22	25
7.00%	5	9	18	28	32	37	46	47	52	47
6.50%-6.99%	7	11	10	14	21	27	33	34	37	40
< 6.50%	0	0	2	2	2	2	8	12	11	10
Total Systems	**126**	**127**	**129**	**129**	**130**	**131**	**131**	**131**	**131**	**131**

Investment Return Assumption – Current Vs Possible Alternatives

- We present in the table below both the current 6.875% assumption and an alternative assumption of 6.75%. This is not to suggest the Board should not consider other alternatives.

Recommended Inflation/Salary & Alternative Investment Return Assumptions					
	Recommended Inflation	Investment Return		Recommended Salary Growth	
		Nominal	Real	Nominal	Real
Current = 6.875%	2.50%	6.875%	4.27%	2.80%	0.3%
Alternative = 6.75%	2.50%	6.75%	4.15%	2.80%	0.3%
Change	0.0%	**-0.125%**	**-0.12%**	0.0%	0.0%

- The investment return assumption selected by the Board will be used in the December 31, 2025 actuarial valuation.

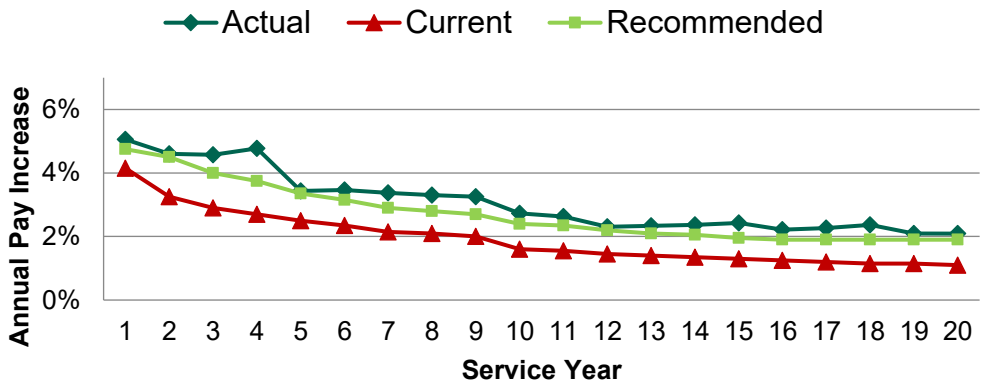
Career Salary Increase Assumptions

Career Salary Increases are the increases in pay related to merit and promotions that are experienced above and beyond the General Salary Growth ("across-the-board", inflationary-type increases). Career Salary Increases are typically more prominent in the earlier Service Years.

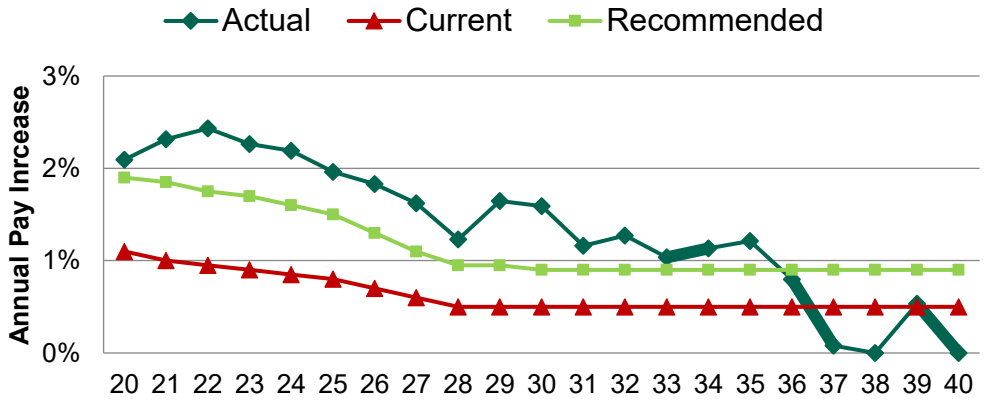
Actual career salary increases have been higher than expected at nearly all service levels of an employee's career.

Recommending reductions at every service level, ranging from 0.40-1.25% increases, and averaging about 0.77% higher. Projected final salary for 30-year service retiree would be about 24% higher than under current assumptions.

2020-2024 Career Salary Increase Experience for Service Years 1-20



2020-2024 Career Salary Increase Experience for Service Years 20-40



Current vs Recommended Career Salary Increase Assumptions

Years of Credited Service	Current Assumed Annual Increase in Career Salary	Recommended Assumption - Annual Increase in Career Salary	Years of Credited Service	Current Assumed Annual Increase in Career Salary	Recommended Assumption - Annual Increase in Career Salary
1	4.15%	4.75%	**16**	1.25%	1.90%
2	3.25%	4.50%	**17**	1.20%	1.90%
3	2.90%	4.00%	**18**	1.15%	1.90%
4	2.70%	3.75%	**19**	1.15%	1.90%
5	2.50%	3.35%	**20**	1.10%	1.90%
6	2.35%	3.15%	**21**	1.00%	1.85%
7	2.15%	2.90%	**22**	0.95%	1.75%
8	2.10%	2.80%	**23**	0.90%	1.70%
9	2.00%	2.70%	**24**	0.85%	1.60%
10	1.60%	2.40%	**25**	0.80%	1.50%
11	1.55%	2.35%	**26**	0.70%	1.30%
12	1.45%	2.20%	**27**	0.60%	1.10%
13	1.40%	2.10%	**28**	0.50%	0.95%
14	1.35%	2.05%	**29**	0.50%	0.95%
15	1.30%	1.95%	**30+**	0.50%	0.90%

03

Demographic Assumptions

Demographic Assumptions

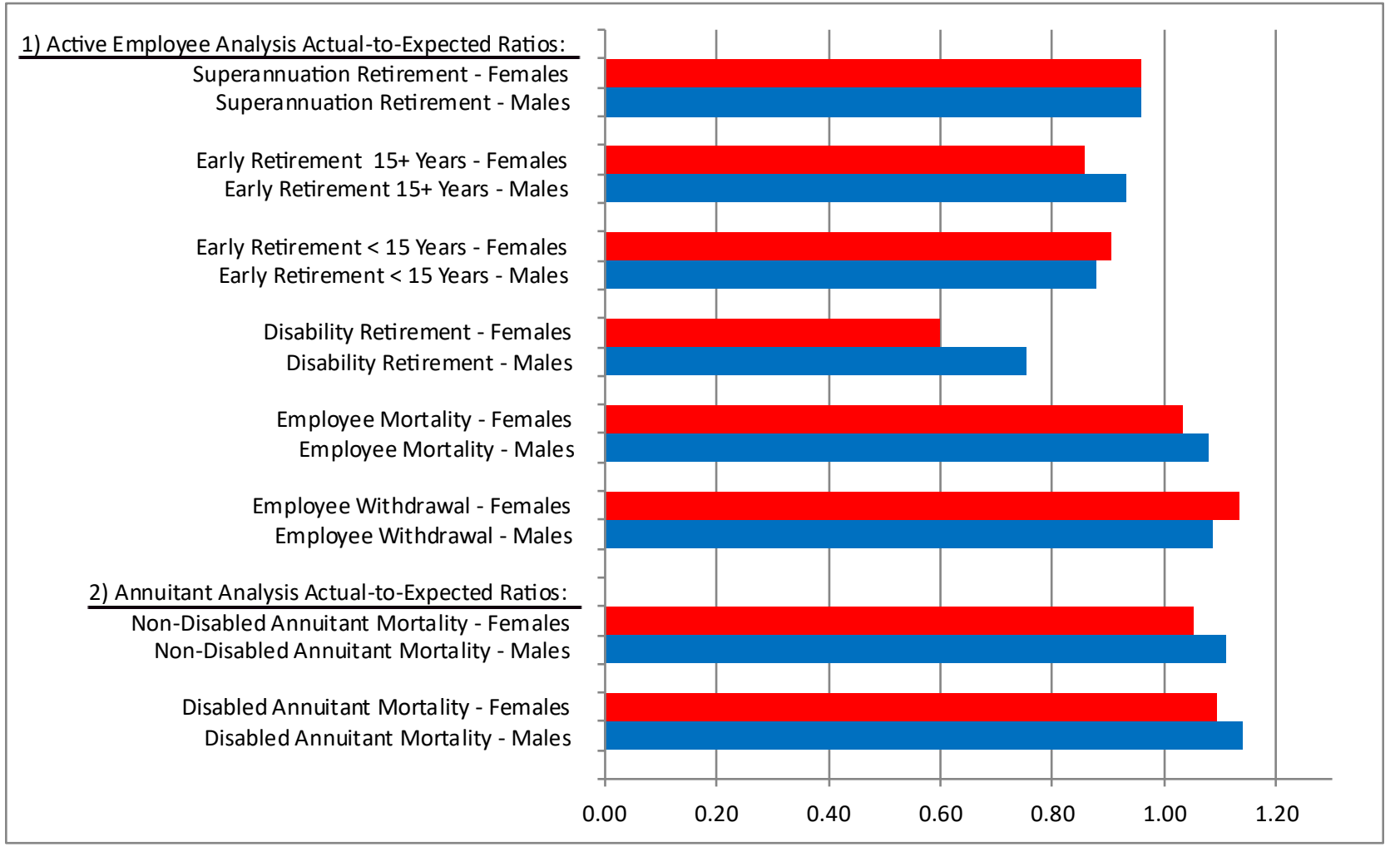
- The terminations from active employment for SERS participants are analyzed by five categories depending on their eligibility for SERS benefits:
  - Deaths
  - Disabilities
  - Superannuation retirements
  - Early retirements
  - Other separations from active employment (withdrawals...vested & non-vested)

  In addition, we analyzed the mortality experience of annuitants.

  Actual-to-expected ratios measure accuracy of current assumptions:
  - If greater than 1.0, current assumption is under-predicting number of occurrences.
  - If less than 1.0, current assumption is over-predicting number of occurrences.

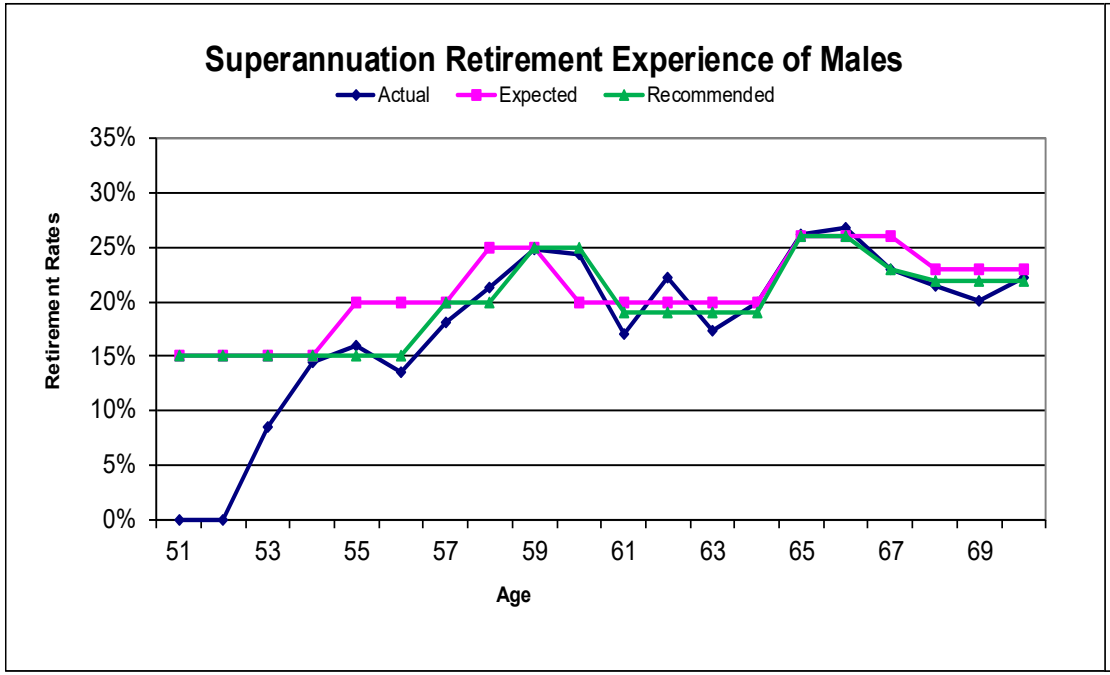
  Our analyses of general employees (Classes AA, A, A-3 & A-4, other than special classes) calculated actual-to-expected ratios (as shown on next page). In general, we develop recommended assumptions resulting in (i) overall actual-to-recommended ratios near 1.0 and (ii) improved fit by age/service. (Experience of Classes A-5 & A-6 will be studied in future actuarial investigations.)

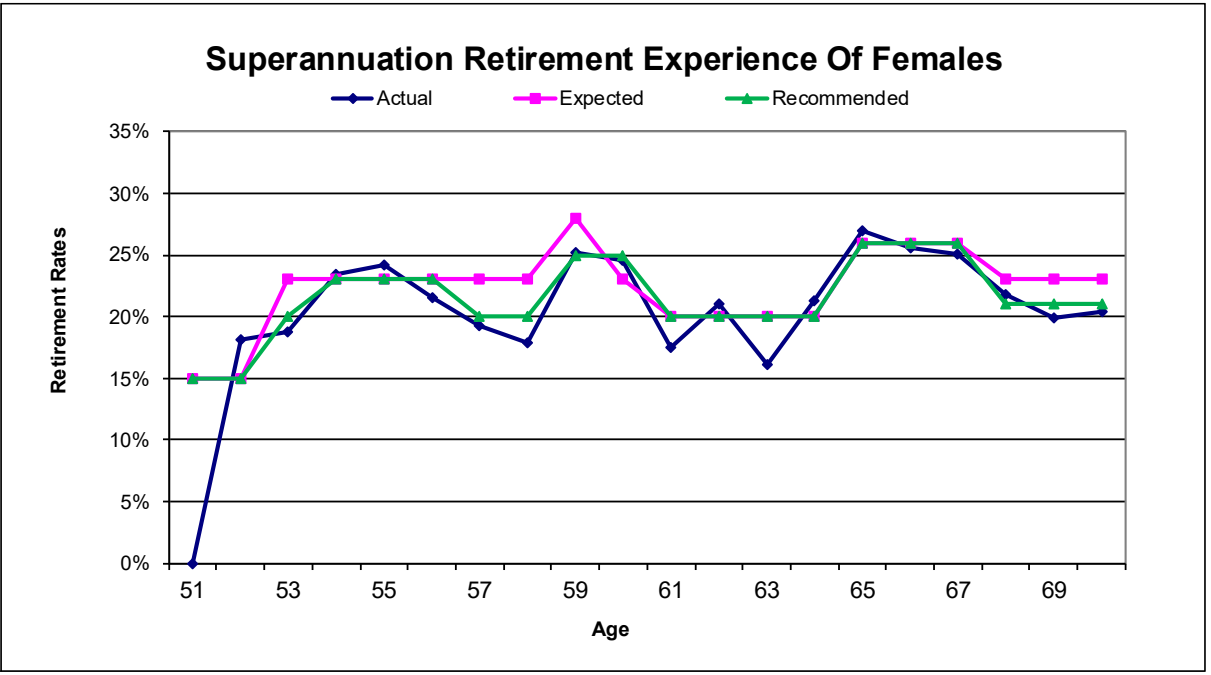
2020 - 2024 Actual-to-Expected Ratios



Superannuation Retirement Assumptions

- In general, for both males and females, (i) relatively fewer employees are retiring at, or prior to, the earliest superannuation age and (ii) relatively more are deferring retirement until Social Security Normal Retirement Ages (65-67) or beyond.
- Therefore recommending: For males and females, rates were lower or unchanged for all ages below SSNRA except at age 60 where both male and female rates increased.





Annuitant Mortality Assumptions

- The 2020 - 2024 mortality experience of SERS annuitants did not deviate significantly from our assumed death rates (as predicted by the current PubG-2010 mortality tables with MP2019 improvement). Actual-to-expected ratios were:
  - 1.11 for Male Non-Disabled Annuitants (i.e., we have been under-predicting total deaths)
  - 1.05 for Female Non-Disabled Annuitants (i.e., we have been under-predicting total deaths)
  - 1.14 for Male Disabled Annuitants (i.e., we have been under-predicting total deaths)
  - 1.09 for Female Disabled Annuitants (i.e., we have been under-predicting total deaths)
- In 2025, the Society of Actuaries published a new set of mortality tables (the Pub-2016 tables) based exclusively on the experience of U.S. public retirement plans. We reviewed the SERS experience relative to the new tables and developed a revised set of assumptions to:
  - Be based on the Society of Actuaries' Pub-2016 study of public sector retirement systems
  - Better reflect the mortality experience of SERS annuitants in 2023 and/or 2024 (in order to attempt to remove the COVID impact)
  - Include the most recent forecast of future mortality improvements (future increases in life expectancy)

Other Demographic Assumptions

- Based upon our other 2020–2024 demographic experience analyses, we recommend the following additional demographic assumption changes that have relatively minimal effects on the employer contribution rates:

Applicable to all active employees

- No change to active mortality tables since higher actual deaths (mainly seen in 2021) are not expected to continue
- Decreases to disability retirement rates for both males and females

Applicable to general (Classes AA, A, A-3 & A-4 other than special classes) employees

- Net decreases to early retirement rates for those with 15+ yrs of service for both males and females
- Net decreases to early retirement rates for those with < 15 yrs of service for both males and females
- Net increases to employee withdrawal rates for both males and females

Applicable to employees in various special benefit classes

- Changes to superannuation rates as follows: Decreases for state police (> 19 yrs service) and judges/justices, increases for other hazardous duty employees and legislators
- Changes to early retirement rates as follows: Increases for state police and other hazardous duty employees; decreases for judges/justices and legislators
- Changes to withdrawal rates as follows: Increases for state police, other hazardous duty employees and judges/justices; decreases for legislators

04

Estimated Cost Impact of Recommended Assumption Changes

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

		Actual 12/31/24 Valuation Results	12/31/24 Results Using Recommended Demographic Assumptions **AND:**	
	Economic Assumptions			
	Investment Return:	6.875%	Current 6.875%	Alternative 6.75%
	Annual Inflation:	2.50%	Current 2.50%	Recommended 2.50%
I.	**Present Value of Benefits:**			
	A) Active and Inactive Participants			
	1) Superannuation and Withdrawal	$ 28,777,205,699	$ 30,020,826,245	$ 30,727,824,255
	2) Disability	838,923,106	651,214,523	666,017,928
	3) Death	823,237,049	869,599,485	880,791,069
	4) Refunds	126,697,493	135,159,041	135,263,304
	5) Special Police and Enforcement Officer Benefits	-	-	-
	6) Subtotal	$ 30,566,063,347	$ 31,676,799,294	$ 32,409,896,556
	B) Annuitants and Beneficiaries	35,484,703,844	35,164,515,101	35,508,487,395
	C) Total	$ 66,050,767,191	$ 66,841,314,395	$ 67,918,383,951
II.	**Present Value of Member and Employer Contributions:**			
	A) Employer Portion of Normal Cost	$ 4,596,473,939	$ 5,097,614,822	$ 5,412,661,477
	B) Member Contributions	4,373,056,758	4,440,068,942	4,483,043,913
	C) Total	$ 8,969,530,697	$ 9,537,683,764	$ 9,895,705,390
III.	**Actuarial Accrued Liability: (I) - (II)**	$ 57,081,236,494	$ 57,303,630,631	$ 58,022,678,561
IV.	**Actuarial Value of Assets**	$ 40,106,952,931	$ 40,106,952,931	$ 40,107,194,795
V.	**Unfunded Liability: (III) - (IV)**	$ 16,974,283,563	$ 17,196,677,700	$ 17,915,483,766
VI.	**Amortization of Unfunded Liability as Percentage of Pay**	24.69%	24.77%	25.30%
VII.	**Employer Normal Cost as Percentage of Pay**	7.65%	8.22%	8.58%
VIII.	**Extra Contribution to Return Act 5 Savings**	0.00%	0.00%	0.00%
IX.	**Total Employer Cost : (VI) + (VII) + (VIII)**	32.34%	32.99%	33.88%
X.	**Employer Cost Increase Vs Actual 12/31/24 Valuation**	0.00%	0.65%	1.54%
XI.	**Funded Status (Actuarial Assets): (IV)/(III)**	70.3%	70.0%	69.1%

Thank you

KORN FERRY®