

THREE: APPENDICES

TERMINATION RATES

Methodology

The termination rates assumption represents the probability that a member will leave active employment status without becoming disabled or retiring. We compared the actual rate of termination against what we expected to determine the accuracy of our termination rates assumption over the study period. For each retirement plan, we counted the number of members at the beginning of the year (exposures) and the number of terminations during the year. We divided the number of terminations by the number of exposures to arrive at the actual rate of termination. The actual rate of termination was calculated for both members not eligible for retirement and members eligible for retirement. We compared the actual rate to expected rate of termination over the full period and on an annual basis. This helped us identify trends in the data where our assumption differed from what actually happened.

We developed new termination rate assumptions based on historical actual-to-expected measurements and applied professional judgment on future termination behavior. In most cases, we did not develop a new assumption to perfectly replicate the study period. We targeted a smaller move than the study experience would indicate to account for future experience not exactly matching the past. We also considered simplifications to the assumption where we believe the additional complexity does not offer a significant increase in the modeling accuracy.

Analysis

We consider many factors when developing updated assumptions as part of this study. The discussion that follows divides those factors into two sections, a review of historical data and a review of key demographic factors. When looking at historical data we are determining whether any historical anomalies exist that might skew results and if recent experience suggests any trends in the data. This helps us get a solid foundation on reliable past experience and where it might be headed.

We then consider key demographic factors that may influence behavior. Examples include plan choice, gender, and service. Our goal here is to determine which variables suggest the greatest impact on behavior, as those are the ones we'd want to explicitly model, while also not making our assumption unnecessarily complex.

The following provides details into the analysis and decisions we made regarding historical data and demographic factors.

Review of Historical Data – Relying on historical data to set forward-looking termination assumptions requires us to consider if that historical experience will be a good indicator of the future. In other words, if we believe historical data represents an outlier compared to what we think future termination experience will be, we would consider excluding it from the study. It also helps us identify trends. We considered data from 1995-2015 to include in the study. In addition to the historical data, we considered the impact of recent legislation on future termination behavior.

Review of Key Demographic Factors – With the historical data period selected for each plan, we considered population demographics that could influence termination behavior by plan. Some of the demographics we studied include gender, retirement plan selection, retirement eligibility, and service years (or age). We also considered maintaining simplicity when we observed a demographic factor's impact on termination behavior was not significant.

To review the historical data and demographic factors, we compared the actual number of terminations to our old expectation. We calculated an A/E ratio to help us determine trends in the data. An A/E ratio less than 1.00 generally indicates less members are terminating than the old assumption. While an A/E ratio of greater than 1.00 tells us more members are terminating than we assume. In general, we developed a new assumption so that the A/E ratio moved closer to 1.00. Please see the **Methodology** section for more detail on A/E ratios, and see the **Exhibits** section for a comparison of A/E ratio between the old and new assumptions for each system.

THREE: APPENDICES

TERMINATION RATES

continued

The following sections summarize our observations of the review of historical data and key demographic factors:

Review of Historical Data

The prior experience study (*2007-2012 Demographic Experience Study*) relied on data from 1995-2010 to set assumptions. The data following the Great Recession was included in our prior analysis because we did not observe a shift in termination behavior due to the Great Recession, and we felt the time period would still be representative of future behavior.

We compared data gathered since the last experience study (2011-2015) to data used during the prior experience study to determine if trends were emerging. We also considered the impact of recent legislation on termination behavior. As noted in the **Summary** section, some data was excluded from our analysis depending on the plan.

The analysis for the Review of Historical Data will focus on members not eligible for retirement. The data available for retirement-eligible members is limited, so we used the full time period of data (1995-2015) for those members.

Plans 2/3 – PERS, TRS, SERS.

Overall, we observed Plans 2/3 terminations that were higher than expected since the last experience study. The A/E ratio, based on the new data (2011-2015), is above 1.00 for each system. We did not observe any atypical termination experience with the new data, so we chose to set our termination rates assumption using all available data (from 1995-2015).

The following table summarizes how the termination behavior has changed since the prior experience study.

Not Eligible for Retirement									
Plan 2/3 Termination Experience by Year									
Year	PERS 2/3			TRS 2/3			SERS 2/3		
	Actual	Expected	A/E	Actual	Expected	A/E	Actual	Expected	A/E
1995-2010*	116,736	118,394	0.99	26,745	25,632	1.04	46,447	45,368	1.02
2011-2015	44,448	41,110	1.08	8,958	8,788	1.02	15,582	14,644	1.06
Total	161,184	159,503	1.01	35,703	34,420	1.04	62,029	60,011	1.03

*See **Summary** section for omitted data.

Previously, we had developed a combined termination assumption for Plans 2/3; however, retirement plan selection can influence termination behavior. We also considered the plan-specific termination rate trends emerging from the 2011-2015 data.

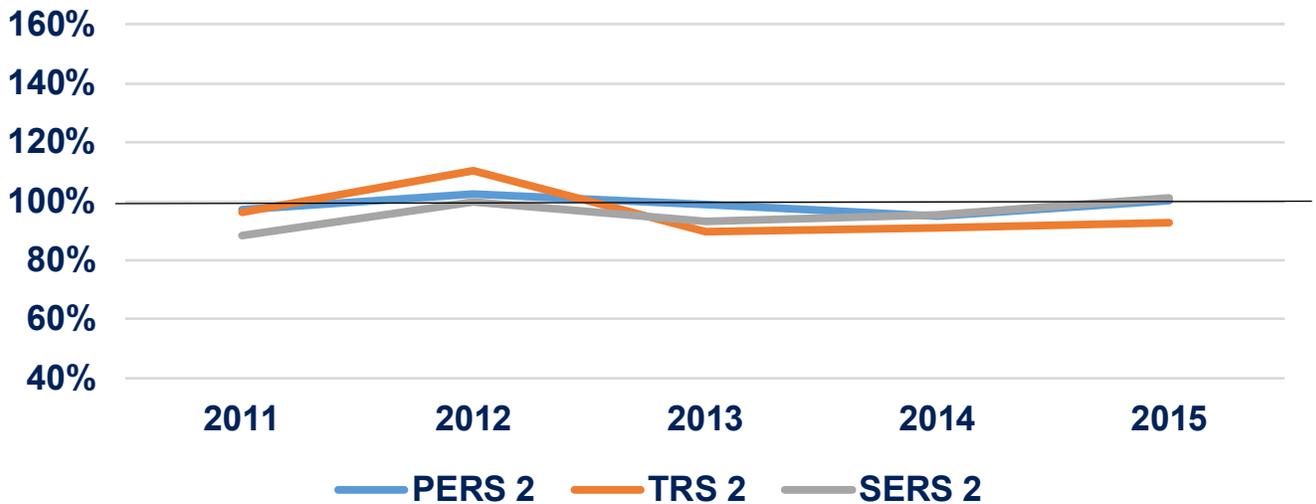
THREE: APPENDICES

TERMINATION RATES

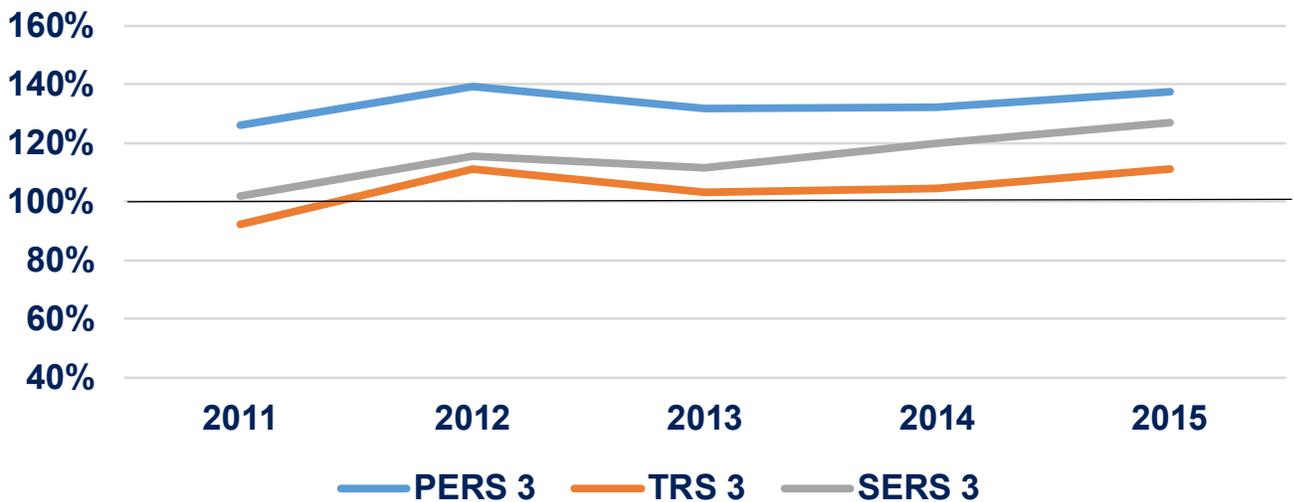
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For the 2011-2015 data, the annual Plan 2 A/E ratios remained within 10 percent of 1.00; however, the annual Plan 3 A/E ratios show a trend of increasing A/E ratios. Plan 3 terminations have been steadily increasing compared to what we expected during the prior experience study. Further analysis on plan-specific termination rates is contained in the **Review of Demographic Factors** section.

A/E Ratios - Plan 2



A/E Ratios - Plan 3



Recent increases in state funding for basic education has led to higher than expected short-term salary increases for members of TRS and SERS. The salary increases could improve retention in TRS and SERS.

THREE: APPENDICES

TERMINATION RATES

continued

Public Safety Plans – LEOFF 2, WSPRS 1/2, PSERS 2.

For LEOFF 2, we did not observe any atypical termination experience with the new data, however it was less than expected. WSPRS displayed a significant increase in terminations. The number of WSPRS terminations more than doubled our expectations in 2014 and 2015, which lead to the exclusion of this data from our analysis. We believe this high termination behavior was addressed through recent legislation significantly improving WSPRS member salaries, and we don't expect it to continue. For this reason, we chose to set a termination rates assumption using data from 1995-2015 for LEOFF 2 and 1995-2013 for WSPRS.

PSERS 2 opened in 2006 and our analysis only includes 8 years of data (2008-2015). Given the lack of data, we do not believe we have a long enough time period to set termination rates based on PSERS data. We currently rely on PERS 2 for the PSERS termination assumption since PSERS members were previously covered under PERS prior to plan creation. The A/E ratio for historical PSERS data was 0.93, which indicates that PERS 2 was a reasonable assumption for PSERS data. Until we have adequate data to set rates based on PSERS experience, we will continue to rely on PERS 2 to inform the PSERS termination since we expect PSERS to have similar behavior as PERS 2.

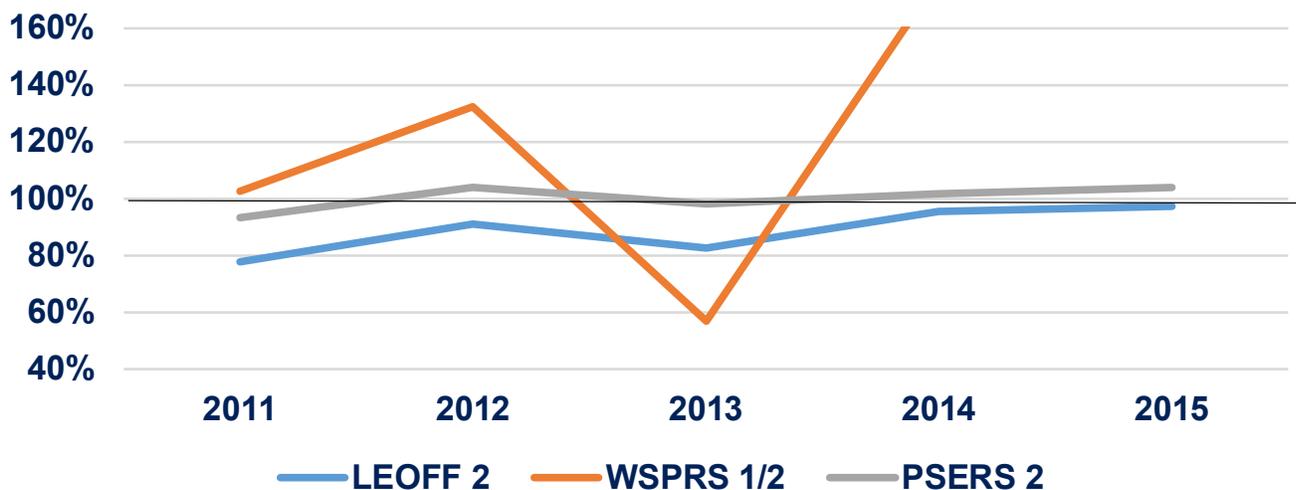
The following table summarizes how the termination behavior has changed since the prior experience study.

Not Eligible for Retirement						
Public Safety Plans Termination Experience by Year						
Year	LEOFF 2			WSPRS 1/2		
	Actual	Expected	A/E	Actual	Expected	A/E
1995-2010*	3,427	3,468	0.99	171	163	1.05
2011-2015*	983	1,108	0.89	31	32	0.97
Total	4,410	4,576	0.96	202	195	1.04

*See *Summary* section for omitted data.

The previous table provides a helpful look at the total A/E ratio over multiple years of data, but we also considered annual trends emerging in the public safety plans. No annual trends emerged for LEOFF 2 or PSERS 2. WSPRS displayed significant volatility from one year to the next, which is somewhat normal given its small size. The WSPRS A/E ratio exceeds 1.60 for the excluded valuation years of 2014 and 2015.

A/E Ratios - Public Safety Plans



THREE: APPENDICES

TERMINATION RATES

continued

Plans 1 – PERS, TRS, LEOFF.

Given the declining size of the Plans 1 and the declining number of annual terminations, we no longer rely on Plans 1 data to develop termination rates assumptions. We also don't believe the termination assumption to be a significant assumption going forward.

The following table summarizes the maturity of Plans 1 by displaying the number of active members to annuitants.

Plan 1 Counts at June 30, 2017*			
	PERS 1	TRS 1	LEOFF 1
Total Active	2,597	698	40
Eligible for Retirement	2,386	693	40
Not Eligible for Retirement	211	5	0
Total Annuitants	48,111	34,151	7,228

*Source: OSA, 2017 AVR.

Given we don't believe a Plans 1 termination assumption is significant moving forward; we made the following simplifications to our modeling. We rely on PERS Plan 2 and TRS Plan 2 termination assumptions for PERS Plan 1 and TRS Plan 1, respectively. We assume zero future terminations in LEOFF Plan 1 since all members are eligible for retirement.

We do not assume any terminations will occur for Plan 1 members eligible for retirement.

THREE: APPENDICES

TERMINATION RATES

continued

Review of Key Demographic Factors

After analyzing the historical data period, and determining any observed trends, we then look at termination behavior by certain demographic characteristics. Our goal is to find the primary characteristics that influence member behavior to help us better model these populations going forward.

1. Plan 2 versus Plan 3 Termination Experience.

Plan 2 and Plan 3 have fundamental differences in design, which we expect influences termination behavior. Plan 2 is a defined benefit plan, with five-year vesting, while Plan 3 is a hybrid of defined benefit and defined contribution, with up to ten-year vesting. Selection of retirement plan (or plan choice) may influence termination behavior because their selection may indicate the employee's expected longevity within the plan. For example, an employee may select Plan 3 if they don't intend to stay at the same job for long and prefer the portability of their defined contribution benefit.

In the prior study, we observed higher rates of termination in Plan 3, but lacked sufficient experience to set credible plan specific rates. We added five more years of experience study data since the prior study, and we continue to observe Plan 3 members with higher rates of termination than Plan 2 members. For purposes of assumption setting, we now develop separate Plan 2 and Plan 3 termination assumptions for the first ten years of service (or service years 0-9). PERS, which provided the longest history on plan choice, continued to show higher Plan 3 termination rates than Plan 2 through the first ten years of service. It was not as pronounced in TRS and SERS, and our new assumption reflects more similar plan experience for those systems. Beyond ten years of service, we combined Plan 2 and Plan 3 experience to develop a termination assumption for both plans.

Plan 3 may continue to display higher levels of termination than Plan 2 beyond ten years, but we don't expect plan choice to be as strong of an influence the longer the member remains employed. The data is also limited in the longer service years. We will continue to monitor plan specific rates in future studies and may expand the plan-specific assumption.

The following table compares the Plan 2 and Plan 3 average termination rates for Plans 2/3.

Not Eligible for Retirement										
Plan 2 vs Plan 3 Termination Experience*										
		PERS			TRS			SERS		
1995-2015	Lives	Term	Term Rate	Lives	Term	Term Rate	Lives	Term	Term Rate	
Plan 2	1,941,201	132,581	0.068	225,998	9,558	0.042	447,399	34,507	0.077	
Plan 3	250,653	28,603	0.114	641,367	26,145	0.041	324,979	27,522	0.085	
Total	2,191,854	161,184	0.074	867,365	35,703	0.041	772,378	62,029	0.080	

*See **Summary** section for omitted data.

Some plans have more years of experience study data because of plan creation¹ and restrictions on plan choice.² PERS has the longest history of plan choice and also showed the most pronounced difference between Plan 2 and Plan 3 termination rates. Since plan choice wasn't always available in TRS and SERS, that may influence the plan specific results.

We also don't believe plan choice will be as strong an indicator of termination behavior in TRS. Compared to PERS, we believe TRS members are less likely to switch between state employment and the private sector. This is supported by the overall TRS termination rate across both plans and is reflected in our new assumption.

As more plan choice data is collected, we will continue to monitor the plan specific assumptions in future studies.

¹PERS Plan 2 opened October 1, 1977, and PERS Plan 3 opened March 1, 2002. TRS Plan 2 opened October 1, 1977, and TRS Plan 3 opened July 1, 1996. SERS Plan 2 and Plan 3 opened September 1, 2000.

²Newly hired employees in SERS and TRS were placed in Plan 3 prior to 2007. After 2007, newly hired employees have a choice between Plan 2 and Plan 3. PERS employees hired since Plan 3 opened in 2002 have had the choice between Plan 2 and Plan 3.

THREE: APPENDICES

TERMINATION RATES

continued

2. Male versus Female Termination Experience.

We observed the gender specific termination trends using the data determined in the **Review of Historical Data** section.

We previously assumed gender specific termination rates in PERS, TRS, SERS, and PSERS based on observations from the prior experience study (*2007-12 Demographic Experience Study*). All other systems assume gender-neutral termination rates. Historically we've typically observed females to terminate at a higher rate than males.

Plans 2/3 – PERS, TRS, SERS.

While we continue to observe females exhibiting different termination behavior than males, and expect this to continue, we combined male and female data for the purpose of assumption setting. In our opinion, a set of gender-neutral termination rates provides sufficient accuracy without further complicating the model since we do not expect the demographic make-up, i.e., male to female ratio, of these systems to change.

The following table summarizes the gender-specific average termination rate for Plans 2/3.

Not Eligible for Retirement									
Male vs Female Termination Experience*									
	PERS 2/3			TRS 2/3			SERS 2/3		
1995-2015	Lives	Term	Term Rate	Lives	Term	Term Rate	Lives	Term	Term Rate
Males	1,037,194	68,681	0.066	248,789	8,360	0.034	167,414	13,787	0.082
Females	1,154,660	92,503	0.080	618,576	27,343	0.044	604,964	48,242	0.080
Total	2,191,854	161,184	0.074	867,365	35,703	0.041	772,378	62,029	0.080

*See *Summary* section for omitted data.

Public Safety Plans – LEOFF 2, WSPRS 1/2, PSERS 2.

We maintain the single set of gender-neutral termination rates in LEOFF 2 and WSPRS 1/2 because of the heavy population weighting of the systems toward males. As of the 2017 AVR, approximately 90 percent of the population is male in LEOFF 2 and WSPRS 1/2.

As discussed in the **Review of Historical Data** section, we will rely on PERS Plan 2 to inform the PSERS termination rate assumption; however, males make up a greater portion of the population in PSERS than PERS. We currently assume 70 percent male in PSERS and only 50 percent male in PERS. Given we expect males to continue to display lower levels of termination than females, we adjusted the PERS 2 combined rates to reflect the difference in the Percent Male ratio of the plans. We multiplied the PERS 2 termination rates by 0.95 to account for the higher population of males in PSERS, and expected lower termination rates than PERS.

To determine the 0.95 adjustment factor, we looked at the observed averaged termination rate in PERS Plan 2. They are .061, .075, and .068 for males, females, and combined genders, respectively. Given PSERS is assumed to have a higher percentage of male members, we estimated a combined termination rate for PERS Plan 2 if it were 70 percent male/30 percent female. This resulted in a combined gender termination rate of .065, which is approximately 0.95 of the PERS 2 combined termination rate of .068.

THREE: APPENDICES

TERMINATION RATES

continued

3. LEOFF 2 Law Enforcement Officer and Firefighter Termination Experience.

Experience indicates different termination behavior between Law Enforcement Officers (LEO) and Fire Fighters (FF). LEOs experience higher rates of termination, across all service levels, than FFs. We developed separate rates for each occupation, but ultimately decided a blended termination rates assumption remains reasonable. In our opinion, this provides sufficient accuracy without further complicating the model.

The following table summarizes the termination experience for LEOs and FFs during 1995 through 2015.

Not Eligible for Retirement			
Termination Experience by Occupation			
LEOFF 2			
1995-2015	Lives	Term	Term Rate
FF	106,188	1,068	0.010
LEO	132,444	3,342	0.025
Total	238,632	4,410	0.018

**See Summary section for omitted data.*

LEOs are more than twice as likely to terminate as FFs, so we developed separate termination rates for each occupation. To capture a changing demographic, we then blended the occupation specific rates. We relied on the LEOFF Plan 2 percent FF assumption, which assumes a 45 percent/55 percent split between FFs and law enforcement. Blending the rates allows us to simplify modeling as well as rely on expectations of future experience.

4. Eligibility for Retirement.

Termination behavior varies depending on the retirement eligibility of members. Experience indicates that members not eligible for retirement will have different termination behavior than members eligible for retirement.

For this report, we now include analysis on termination behavior for members who are eligible for retirement. Upon attaining retirement eligibility, a member who plans to leave the retirement system has three options: (1) Terminate and withdraw accumulated savings, (2) Terminate and defer commencement of retirement benefits, (3) Retire and immediately commence retirement benefits. In this study, we collected data to set terminations rates for retirement eligible members choosing options 1 or 2. This update to the termination rate modeling replaces the Deferred Annuity Assumption developed in the prior study. Based on our Probability of Withdrawing Contributions Assumption analysis, we assume all retirement eligible members that terminate will defer commencement of retirement benefits. The following sections will detail termination assumptions for members eligible for retirement.

Plans 2/3 – PERS, TRS, SERS.

Our data shows that some members elect to defer commencement of retirement benefits even when eligible for retirement. Termination among retirement eligible plan 2/3 members is most prevalent among members who are also eligible for early retirement benefits.³ Members eligible for normal retirement benefits⁴ have relatively lower rates of termination.

Higher rates of termination are occurring for members eligible for early retirement since they can choose to receive a smaller reduction to their retirement benefit if they defer commencement. Deferring commencement until age 65 will provide unreduced retirement benefits for members. For this study, we developed termination rates assumptions for Plan 2 members and Plan 3 members eligible for early retirement.

¹Plan 2 members are eligible for early retirement once they accrue 20 years of service and are 55 years old. Plan 3 members are eligible for early retirement once they accrue ten years of service and are 55 years old.

²Accrue five years of service and are 65 years old.

THREE: APPENDICES

TERMINATION RATES

continued

The following table summarizes the Plan 2 and Plan 3 termination behavior.

Eligible for Retirement						
Eligible for Retirement Termination Experience*						
	Early Retirement			Normal Retirement		
1995-2015	Lives	Term	Term Rate	Lives	Term	Term Rate
PERS 2	119,824	1,554	0.013	42,804	222	0.005
PERS 3	26,075	1,070	0.041	2,505	29	0.012
TRS 2	12,804	196	0.015	3,810	8	0.002
TRS 3	86,729	3,112	0.036	5,820	44	0.008
SERS 2	19,281	309	0.016	13,234	81	0.006
SERS 3	63,389	2,298	0.036	9,119	161	0.018

*See **Summary** section for omitted data.

We see similar termination rates across all Plans 2 and similar termination behavior across all Plans 3. We considered developing termination rates assumptions for Plans 2/3 members eligible for normal retirement. Ultimately, we elected to assume these members would choose to immediately begin commencement of their retirement benefits since there isn't a financial incentive to delay commencement of these benefits like there is with early retirement and the observed frequency was much lower as well.

Public Safety Plans – LEOFF 2, WSPRS 1/2, PSERS 2.

Similar to Plans 2/3, some retirement eligible members of the Public Safety Plans will elect to defer commencement of retirement benefits; however, LEOFF 2 and WSPRS 1/2 had relatively lower levels of termination than Plans 2/3. For this reason, we will continue to assume these members will immediately begin commencement of retirement benefits upon leaving active status.

The PSERS 2 members eligible for retirement displayed similar termination behavior as Plans 2/3. The PSERS data indicates that a termination assumption is appropriate for members eligible for early retirement, but the data is currently limited. Given the lack of data in PSERS, we will rely on PERS 2 to inform the PSERS termination assumption.

The following table summarizes the Public Safety Plans termination behavior between the two retirement eligibilities (Early and Normal).

Eligible for Retirement						
Eligible for Retirement Termination Experience*						
	Early Retirement			Normal Retirement		
1995-2015	Lives	Term	Term Rate	Lives	Term	Term Rate
LEOFF 2	10,713	41	0.004	24,274	76	0.003
WSPRS 1/2	Not Applicable			2,072	1	0.000
PSERS 2	1,051	23	0.022	40	0	0.000

*See **Summary** section for omitted data.

THREE: APPENDICES

TERMINATION RATES

continued

5. Service-Based and Age-Based Tables.

The methodology for observing termination experience changes based upon the retirement eligibility of members. We used a service-based table for members not eligible for retirement and an age-based table for members eligible for retirement.

Not Eligible for Retirement.

We believe service is the best indicator of termination for members not eligible for retirement. Termination rates are highest for early career employees. An early career employee can enter the retirement system at any age, so the service-based table is a reliable measurement for termination behavior.

Eligible for Retirement.

We considered both a service-based and an age-based table for members that are retirement eligible. We believe both approaches would be reasonable but elected to use an age-based table for consistency with how retirement rates are developed.

New Assumptions

Not Eligible for Retirement.

We assume gender-neutral (Both) termination rates for all systems. The following tables summarize the old and new termination rates assumption for members not eligible for retirement.

THREE: APPENDICES

TERMINATION RATES

continued

Not Eligible for Retirement						
PERS Termination Rates						
Service	Plan 1 and Plan 2			Plan 3		
	Old	New		Old	New	
	Males	Females	Both	Males	Females	Both
0	0.262	0.262	0.260	0.262	0.262	0.300
1	0.155	0.168	0.150	0.155	0.168	0.190
2	0.101	0.117	0.105	0.101	0.117	0.130
3	0.075	0.093	0.080	0.075	0.093	0.100
4	0.063	0.076	0.065	0.063	0.076	0.085
5	0.054	0.067	0.060	0.054	0.067	0.070
6	0.045	0.058	0.055	0.045	0.058	0.065
7	0.042	0.053	0.050	0.042	0.053	0.060
8	0.039	0.049	0.045	0.039	0.049	0.055
9	0.036	0.045	0.040	0.036	0.045	0.055
10	0.034	0.042	0.040	0.034	0.042	0.040
11	0.031	0.038	0.035	0.031	0.038	0.035
12	0.029	0.035	0.030	0.029	0.035	0.030
13	0.027	0.033	0.030	0.027	0.033	0.030
14	0.025	0.030	0.030	0.025	0.030	0.030
15	0.024	0.028	0.030	0.024	0.028	0.030
16	0.022	0.025	0.025	0.022	0.025	0.025
17	0.020	0.023	0.020	0.020	0.023	0.020
18	0.019	0.022	0.020	0.019	0.022	0.020
19	0.018	0.020	0.020	0.018	0.020	0.020
20	0.015	0.018	0.020	0.015	0.018	0.020
21	0.013	0.016	0.020	0.013	0.016	0.020
22	0.011	0.014	0.015	0.011	0.014	0.015
23	0.010	0.012	0.015	0.010	0.012	0.015
24	0.009	0.011	0.015	0.009	0.011	0.015
25	0.007	0.009	0.015	0.007	0.009	0.015
26	0.006	0.008	0.010	0.006	0.008	0.010
27	0.006	0.007	0.010	0.006	0.007	0.010
28	0.005	0.006	0.010	0.005	0.006	0.010
29	0.004	0.006	0.010	0.004	0.006	0.010
30+	0.004	0.005	0.010	0.004	0.005	0.010

THREE: APPENDICES

TERMINATION RATES

continued

Not Eligible for Retirement						
TRS Termination Rates						
Service	Plan 1 and Plan 2			Plan 3		
	Old	New		Old	New	
	Males	Females	Both	Males	Females	Both
0	0.111	0.111	0.120	0.111	0.111	0.120
1	0.090	0.095	0.080	0.090	0.095	0.090
2	0.060	0.072	0.065	0.060	0.072	0.075
3	0.045	0.061	0.050	0.045	0.061	0.060
4	0.041	0.053	0.050	0.041	0.053	0.055
5	0.037	0.047	0.045	0.037	0.047	0.050
6	0.030	0.041	0.040	0.030	0.041	0.045
7	0.027	0.037	0.035	0.027	0.037	0.040
8	0.025	0.033	0.030	0.025	0.033	0.030
9	0.023	0.030	0.030	0.023	0.030	0.030
10	0.021	0.027	0.025	0.021	0.027	0.025
11	0.020	0.024	0.020	0.020	0.024	0.020
12	0.018	0.021	0.020	0.018	0.021	0.020
13	0.017	0.019	0.020	0.017	0.019	0.020
14	0.015	0.017	0.015	0.015	0.017	0.015
15	0.014	0.016	0.015	0.014	0.016	0.015
16	0.013	0.016	0.015	0.013	0.016	0.015
17	0.012	0.015	0.010	0.012	0.015	0.010
18	0.012	0.015	0.010	0.012	0.015	0.010
19	0.011	0.014	0.010	0.011	0.014	0.010
20	0.010	0.013	0.010	0.010	0.013	0.010
21	0.010	0.013	0.010	0.010	0.013	0.010
22	0.009	0.012	0.010	0.009	0.012	0.010
23	0.009	0.011	0.010	0.009	0.011	0.010
24	0.009	0.010	0.010	0.009	0.010	0.010
25	0.008	0.010	0.010	0.008	0.010	0.010
26	0.008	0.009	0.010	0.008	0.009	0.010
27	0.007	0.009	0.010	0.007	0.009	0.010
28	0.007	0.008	0.010	0.007	0.008	0.010
29	0.006	0.008	0.010	0.006	0.008	0.010
30+	0.006	0.007	0.010	0.006	0.007	0.010

THREE: APPENDICES

TERMINATION RATES

continued

Not Eligible for Retirement						
SERS Termination Rates						
Service	Plan 2			Plan 3		
	Old	New		Old	New	
	Males	Females	Both	Males	Females	Both
0	0.245	0.199	0.180	0.245	0.199	0.180
1	0.159	0.131	0.130	0.159	0.131	0.150
2	0.117	0.103	0.110	0.117	0.103	0.120
3	0.100	0.079	0.090	0.100	0.079	0.100
4	0.081	0.068	0.070	0.081	0.068	0.080
5	0.066	0.062	0.070	0.066	0.062	0.075
6	0.061	0.056	0.060	0.061	0.056	0.065
7	0.056	0.053	0.055	0.056	0.053	0.060
8	0.051	0.050	0.050	0.051	0.050	0.055
9	0.047	0.047	0.050	0.047	0.047	0.050
10	0.043	0.046	0.045	0.043	0.046	0.045
11	0.039	0.045	0.040	0.039	0.045	0.040
12	0.036	0.044	0.040	0.036	0.044	0.040
13	0.033	0.044	0.040	0.033	0.044	0.040
14	0.030	0.043	0.035	0.030	0.043	0.035
15	0.027	0.043	0.035	0.027	0.043	0.035
16	0.025	0.039	0.035	0.025	0.039	0.035
17	0.025	0.036	0.030	0.025	0.036	0.030
18	0.024	0.035	0.030	0.024	0.035	0.030
19	0.024	0.032	0.025	0.024	0.032	0.025
20	0.023	0.030	0.025	0.023	0.030	0.025
21	0.023	0.028	0.025	0.023	0.028	0.025
22	0.022	0.027	0.020	0.022	0.027	0.020
23	0.021	0.026	0.020	0.021	0.026	0.020
24	0.018	0.025	0.020	0.018	0.025	0.020
25	0.016	0.023	0.010	0.016	0.023	0.010
26	0.014	0.021	0.010	0.014	0.021	0.010
27	0.012	0.019	0.010	0.012	0.019	0.010
28	0.011	0.017	0.010	0.011	0.017	0.010
29	0.009	0.015	0.010	0.009	0.015	0.010
30+	0.008	0.014	0.010	0.008	0.014	0.010

THREE: APPENDICES

TERMINATION RATES

continued

Not Eligible for Retirement							
Public Safety Plans Termination Rates							
Service	LEOFF 2		WSPRS 1/2		PSERS 2		
	Old	New	Old	New	Old	New	
	Both	Both	Both	Both	Males	Females	Both
0	0.107	0.105	0.042	0.045	0.262	0.262	0.250
1	0.048	0.050	0.020	0.020	0.155	0.168	0.140
2	0.024	0.025	0.020	0.020	0.101	0.117	0.100
3	0.019	0.020	0.020	0.020	0.075	0.093	0.075
4	0.019	0.020	0.020	0.020	0.063	0.076	0.060
5	0.018	0.020	0.020	0.020	0.054	0.067	0.060
6	0.017	0.020	0.019	0.020	0.045	0.058	0.050
7	0.017	0.015	0.017	0.020	0.042	0.053	0.050
8	0.016	0.015	0.016	0.015	0.039	0.049	0.040
9	0.015	0.015	0.015	0.015	0.036	0.045	0.040
10	0.015	0.015	0.013	0.010	0.034	0.042	0.040
11	0.014	0.010	0.012	0.010	0.031	0.038	0.035
12	0.014	0.010	0.011	0.010	0.029	0.035	0.030
13	0.013	0.010	0.010	0.010	0.027	0.033	0.030
14	0.012	0.010	0.009	0.010	0.025	0.030	0.030
15	0.012	0.010	0.008	0.010	0.024	0.028	0.030
16	0.011	0.010	0.007	0.005	0.022	0.025	0.025
17	0.010	0.010	0.006	0.005	0.020	0.023	0.020
18	0.010	0.010	0.006	0.005	0.019	0.022	0.020
19	0.009	0.010	0.005	0.005	0.018	0.020	0.020
20	0.008	0.010	0.004	0.005	0.015	0.018	0.020
21	0.008	0.005	0.004	0.005	0.013	0.016	0.020
22	0.007	0.005	0.003	0.005	0.011	0.014	0.015
23	0.006	0.005	0.003	0.005	0.010	0.012	0.015
24	0.006	0.005	0.002	0.005	0.009	0.011	0.015
25	0.005	0.005	0.000	0.000	0.007	0.009	0.015
26	0.004	0.005	0.000	0.000	0.006	0.008	0.010
27	0.004	0.005	0.000	0.000	0.006	0.007	0.010
28	0.003	0.005	0.000	0.000	0.005	0.006	0.010
29	0.002	0.005	0.000	0.000	0.004	0.006	0.010
30+	0.002	0.005	0.000	0.000	0.004	0.005	0.010

Eligible for Retirement.

For this report, we updated our methodology to assume some retirement eligible members will terminate and defer commencement of their retirement benefit. To develop the new recommendation for Plans 2/3, we combined all Plan 2 data and all Plan 3 data to set plan specific rates across PERS, TRS, and SERS.

THREE: APPENDICES

TERMINATION RATES

continued

Eligible for Retirement				
PERS, TRS, and SERS Plans 2/3 Termination Rates				
Age	Plan 2		Plan 3	
	Old	New	Old	New
	Both	Both	Both	Both
55	0.000	0.015	0.000	0.030
56	0.000	0.015	0.000	0.030
57	0.000	0.015	0.000	0.030
58	0.000	0.015	0.000	0.030
59	0.000	0.015	0.000	0.045
60	0.000	0.015	0.000	0.045
61	0.000	0.015	0.000	0.045
62	0.000	0.015	0.000	0.055
63	0.000	0.005	0.000	0.020
64	0.000	0.005	0.000	0.010
65+	0.000	0.000	0.000	0.000

PSERS assumption relies on PERS Plan 2 to inform the assumption. Because PSERS members are eligible to retire as early as age 53, depending on years of service, we extended the table of rates prior to age 55 and assumed similar termination behavior at ages 53 and 54. PSERS also has earlier normal retirement than PERS Plan 2 because members are eligible to retire at age 60 with ten years of PSERS service. We expect PSERS members will have at least ten years of service at age 60 so we assume no termination for retirement eligible members beginning at age 60.

Eligible for Retirement		
PSERS 2 Termination Rates		
Age	Old	New
	Both	Both
53	0.000	0.015
54	0.000	0.015
55	0.000	0.015
56	0.000	0.015
57	0.000	0.015
58	0.000	0.015
59	0.000	0.015
60+	0.000	0.000

THREE: APPENDICES

TERMINATION RATES

continued

Exhibits

PERS

Not Eligible for Retirement

PERS Termination Experience by Year - Old Assumptions

Age	Plan 1 (Males & Females)			Plan 2 (Males and Females)			Plan 3 (Males and Females)		
	Actual	Expected	A/E	Actual	Expected	A/E	Actual	Expected	A/E
1995	694	1,037	0.67	8,178	8,460	0.97	0	0	N/A
1996	651	919	0.71	7,696	8,260	0.93	0	0	N/A
1997	612	832	0.74	8,394	8,374	1.00	0	0	N/A
1998	576	763	0.75	8,515	8,555	1.00	0	0	N/A
1999	572	693	0.83	9,445	9,193	1.03	0	0	N/A
2000	580	625	0.93	10,815	9,502	1.14	0	0	N/A
2001	378	555	0.68	8,622	9,783	0.88	0	0	N/A
2002	345	493	0.70	8,376	8,986	0.93	200	755	0.26
2003	311	425	0.73	7,266	8,422	0.86	1,267	1,073	1.18
2004	314	375	0.84	6,598	7,701	0.86	1,812	1,553	1.17
2005	263	323	0.81	7,678	7,501	1.02	2,485	1,858	1.34
2006	242	281	0.86	8,694	7,196	1.21	2,732	1,995	1.37
2007	170	249	0.68	5,511	7,213	0.76	1,908	2,098	0.91
2008	183	214	0.86	7,338	7,462	0.98	2,882	2,328	1.24
2009	155	184	0.84	6,672	7,569	0.88	2,846	2,546	1.12
2010	107	145	0.74	5,902	6,767	0.87	2,571	2,284	1.13
2011	92	115	0.80	6,046	6,211	0.97	2,756	2,187	1.26
2012	88	89	0.99	5,942	5,796	1.03	2,844	2,040	1.39
2013	65	65	1.00	5,711	5,781	0.99	2,759	2,094	1.32
2014	45	49	0.92	5,677	5,969	0.95	3,012	2,275	1.32
2015	30	38	0.79	6,332	6,309	1.00	3,369	2,447	1.38
Total	6,473	8,468	0.76	155,408	161,011	0.97	33,443	27,533	1.21

Not Eligible for Retirement

PERS Termination Experience by Service Level Old Assumptions*

Service	Plan 2			Plan 3		
	Actual	Expected	A/E	Actual	Expected	A/E
0	27,460	28,057	0.98	7,676	6,567	1.17
1	26,288	28,289	0.93	7,006	5,638	1.24
2	15,096	15,839	0.95	3,645	2,772	1.32
3	10,700	11,118	0.96	2,300	1,745	1.32
4	8,100	8,561	0.95	1,656	1,297	1.28
5	6,829	6,941	0.98	1,314	1,009	1.30
6-9	18,466	18,507	1.00	2,852	2,154	1.32
10-14	12,145	12,521	0.97	1,135	857	1.32
15-19	5,758	5,648	1.02	563	434	1.30
20-24	1,353	1,122	1.21	339	175	1.94
25-29	309	192	1.61	95	33	2.89
30+	77	25	3.13	22	4	6.01
Total	132,581	136,819	0.97	28,603	22,685	1.26

*Data summarized for years 1995-2015. Please see Data section for years omitted.

Not Eligible for Retirement

PERS Termination Experience by Service Level New Assumptions*

Service	Plan 2			Plan 3		
	Actual	Expected	A/E	Actual	Expected	A/E
0	27,460	27,801	0.99	7,676	7,508	1.02
1	26,288	26,218	1.00	7,006	6,623	1.06
2	15,096	15,160	1.00	3,645	3,285	1.11
3	10,700	10,473	1.02	2,300	2,054	1.12
4	8,100	7,940	1.02	1,656	1,572	1.05
5	6,829	6,830	1.00	1,314	1,158	1.13
6-9	18,466	19,043	0.97	2,852	2,720	1.05
10-14	12,145	12,672	0.96	1,135	865	1.31
15-19	5,758	5,920	0.97	563	452	1.24
20-24	1,353	1,464	0.92	339	229	1.48
25-29	309	323	0.96	95	56	1.71
30+	77	58	1.32	22	9	2.51
Total	132,581	133,903	0.99	28,603	26,529	1.08

*Data summarized for years 1995-2015. Please see Data section for years omitted.

THREE: APPENDICES

TERMINATION RATES

continued

PERS (continued)

Not Eligible for Retirement								
PERS Termination Rates								
Service	Plan 2				Plan 3			
	Old	Female	Actual	New	Old	Female	Actual	New
	Male		Both	Both	Male		Both	Both
0	0.262	0.262	0.257	0.260	0.262	0.262	0.307	0.300
1	0.155	0.168	0.150	0.150	0.155	0.168	0.201	0.190
2	0.101	0.117	0.105	0.105	0.101	0.117	0.144	0.130
3	0.075	0.093	0.082	0.080	0.075	0.093	0.112	0.100
4	0.063	0.076	0.066	0.065	0.063	0.076	0.090	0.085
5	0.054	0.067	0.060	0.060	0.054	0.067	0.079	0.070
6	0.045	0.058	0.052	0.055	0.045	0.058	0.071	0.065
7	0.042	0.053	0.048	0.050	0.042	0.053	0.064	0.060
8	0.039	0.049	0.043	0.045	0.039	0.049	0.053	0.055
9	0.036	0.045	0.041	0.040	0.036	0.045	0.057	0.055
10	0.034	0.042	0.036	0.040	0.034	0.042	0.052	0.040
11	0.031	0.038	0.034	0.035	0.031	0.038	0.046	0.035
12	0.029	0.035	0.031	0.030	0.029	0.035	0.039	0.030
13	0.027	0.033	0.029	0.030	0.027	0.033	0.041	0.030
14	0.025	0.030	0.029	0.030	0.025	0.030	0.038	0.030
15	0.024	0.028	0.027	0.030	0.024	0.028	0.036	0.030
16	0.022	0.025	0.025	0.025	0.022	0.025	0.027	0.025
17	0.020	0.023	0.023	0.020	0.020	0.023	0.030	0.020
18	0.019	0.022	0.021	0.020	0.019	0.022	0.026	0.020
19	0.018	0.020	0.017	0.020	0.018	0.020	0.023	0.020
20	0.015	0.018	0.018	0.020	0.015	0.018	0.033	0.020
21	0.013	0.016	0.016	0.020	0.013	0.016	0.023	0.020
22	0.011	0.014	0.015	0.015	0.011	0.014	0.024	0.015
23	0.010	0.012	0.015	0.015	0.010	0.012	0.022	0.015
24	0.009	0.011	0.014	0.015	0.009	0.011	0.025	0.015
25	0.007	0.009	0.013	0.015	0.007	0.009	0.027	0.015
26	0.006	0.008	0.012	0.010	0.006	0.008	0.021	0.010
27	0.006	0.007	0.008	0.010	0.006	0.007	0.012	0.010
28	0.005	0.006	0.010	0.010	0.005	0.006	0.022	0.010
29	0.004	0.006	0.009	0.010	0.004	0.006	0.007	0.010
30+	0.004	0.005	0.013	0.010	0.004	0.005	0.025	0.010

THREE: APPENDICES

TERMINATION RATES

continued

TRS

Not Eligible for Retirement						
TRS Termination Experience by Service Level Old Assumptions*						
Service	Plan 2			Plan 3		
	Actual	Expected	A/E	Actual	Expected	A/E
0	536	402	1.33	2,465	2,415	1.02
1	1,996	2,116	0.94	4,289	4,260	1.01
2	1,336	1,374	0.97	3,187	3,006	1.06
3	983	1,037	0.95	2,696	2,394	1.13
4	864	847	1.02	2,260	2,023	1.12
5	658	656	1.00	1,986	1,764	1.13
6-9	1,551	1,513	1.03	5,412	4,875	1.11
10-14	1,012	898	1.13	2,329	2,593	0.90
15-19	536	466	1.15	874	1,062	0.82
20-24	70	77	0.91	463	474	0.98
25-29	15	18	0.82	155	138	1.13
30+	1	2	0.65	29	13	2.29
Total	9,558	9,405	1.02	26,145	25,015	1.05

*Data summarized for years 1995-2015. Please see **Data** section for years omitted.

Not Eligible for Retirement						
TRS Termination Experience by Service Level New Assumptions*						
Service	Plan 2			Plan 3		
	Actual	Expected	A/E	Actual	Expected	A/E
0	536	434	1.24	2,465	2,604	0.95
1	1,996	1,810	1.10	4,289	4,101	1.05
2	1,336	1,300	1.03	3,187	3,281	0.97
3	983	909	1.08	2,696	2,513	1.07
4	864	845	1.02	2,260	2,222	1.02
5	658	663	0.99	1,986	1,988	1.00
6-9	1,551	1,558	1.00	5,412	5,429	1.00
10-14	1,012	865	1.17	2,329	2,511	0.93
15-19	536	404	1.33	874	920	0.95
20-24	70	69	1.02	463	431	1.08
25-29	15	22	0.69	155	165	0.94
30+	1	2	0.43	29	19	1.51
Total	9,558	8,880	1.08	26,145	26,185	1.00

*Data summarized for years 1995-2015. Please see **Data** section for years omitted.

THREE: APPENDICES

TERMINATION RATES

continued

TRS (continued)

Not Eligible for Retirement									
TRS Termination Experience by Year - Old Assumption									
Age	Plan 1 (Males & Females)			Plan 2 (Males and Females)			Plan 3 (Males and Females)		
	Actual	Expected	A/E	Actual	Expected	A/E	Actual	Expected	A/E
1995	168	344	0.49	1,433	1,597	0.90	0	0	N/A
1996	193	315	0.61	1,573	1,642	0.96	0	0	N/A
1997	164	281	0.58	1,461	1,542	0.95	12	82	0
1998	172	254	0.68	981	431	2.28	692	1,257	0.55
1999	161	223	0.72	503	333	1.51	1,441	1,408	1.02
2000	169	197	0.86	387	282	1.37	1,707	1,519	1.12
2001	259	165	1.57	525	249	2.11	2,771	1,641	1.69
2002	134	144	0.93	312	234	1.33	2,392	2,117	1.13
2003	93	120	0.77	225	215	1.05	2,031	2,113	0.96
2004	79	95	0.83	197	193	1.02	1,974	2,047	0.96
2005	71	77	0.93	240	176	1.36	2,155	2,064	1.04
2006	65	59	1.10	203	158	1.28	2,244	2,124	1.06
2007	26	44	0.60	103	144	0.72	1,232	2,160	0.57
2008	31	30	1.03	176	127	1.38	2,150	1,843	1.17
2009	24	22	1.08	271	254	1.07	1,752	1,717	1.02
2010	18	16	1.10	365	332	1.10	1,553	1,595	0.97
2011	10	11	0.91	325	337	0.96	1,310	1,417	0.92
2012	5	6	0.77	440	398	1.11	1,474	1,328	1.11
2013	9	4	2.20	392	437	0.90	1,279	1,240	1.03
2014	3	2	1.51	473	520	0.91	1,275	1,220	1.04
2015	2	1	1.77	582	627	0.93	1,408	1,264	1.11
Total	1,856	2,412	0.77	11,167	10,229	1.09	30,852	30,155	1.02

THREE: APPENDICES

TERMINATION RATES

continued

TRS (continued)

Not Eligible for Retirement								
TRS Termination Rates								
Service	Plan 2				Plan 3			
	Old		Actual	New	Old		Actual	New
	Male	Female	Both	Both	Male	Female	Both	Both
0	0.111	0.111	0.148	0.120	0.111	0.111	0.114	0.120
1	0.090	0.095	0.088	0.080	0.090	0.095	0.094	0.090
2	0.060	0.072	0.067	0.065	0.060	0.072	0.073	0.075
3	0.045	0.061	0.054	0.050	0.045	0.061	0.064	0.060
4	0.041	0.053	0.051	0.050	0.041	0.053	0.056	0.055
5	0.037	0.047	0.045	0.045	0.037	0.047	0.050	0.050
6	0.030	0.041	0.040	0.040	0.030	0.041	0.045	0.045
7	0.027	0.037	0.036	0.035	0.027	0.037	0.039	0.040
8	0.025	0.033	0.032	0.030	0.025	0.033	0.032	0.030
9	0.023	0.030	0.027	0.030	0.023	0.030	0.028	0.030
10	0.021	0.027	0.028	0.025	0.021	0.027	0.022	0.025
11	0.020	0.024	0.027	0.020	0.020	0.024	0.020	0.020
12	0.018	0.021	0.024	0.020	0.018	0.021	0.018	0.020
13	0.017	0.019	0.021	0.020	0.017	0.019	0.016	0.020
14	0.015	0.017	0.018	0.015	0.015	0.017	0.016	0.015
15	0.014	0.016	0.016	0.015	0.014	0.016	0.013	0.015
16	0.013	0.016	0.019	0.015	0.013	0.016	0.013	0.015
17	0.012	0.015	0.017	0.010	0.012	0.015	0.011	0.010
18	0.012	0.015	0.015	0.010	0.012	0.015	0.010	0.010
19	0.011	0.014	0.015	0.010	0.011	0.014	0.010	0.010
20	0.010	0.013	0.009	0.010	0.010	0.013	0.012	0.010
21	0.010	0.013	0.014	0.010	0.010	0.013	0.011	0.010
22	0.009	0.012	0.010	0.010	0.009	0.012	0.010	0.010
23	0.009	0.011	0.012	0.010	0.009	0.011	0.011	0.010
24	0.009	0.010	0.006	0.010	0.009	0.010	0.010	0.010
25	0.008	0.010	0.006	0.010	0.008	0.010	0.008	0.010
26	0.008	0.009	0.008	0.010	0.008	0.009	0.009	0.010
27	0.007	0.009	0.005	0.010	0.007	0.009	0.011	0.010
28	0.007	0.008	0.010	0.010	0.007	0.008	0.010	0.010
29	0.006	0.008	0.009	0.010	0.006	0.008	0.010	0.010
30+	0.006	0.007	0.004	0.010	0.006	0.007	0.015	0.010

THREE: APPENDICES

TERMINATION RATES

continued

SERS

Not Eligible for Retirement						
SERS Termination Experience by Service Level Old Assumptions*						
Service	Plan 2			Plan 3		
	Actual	Expected	A/E	Actual	Expected	A/E
0	6,192	6,225	0.99	4,619	4,808	0.96
1	6,101	6,108	1.00	6,047	5,451	1.11
2	4,073	4,000	1.02	3,793	3,392	1.12
3	3,088	2,899	1.07	2,657	2,323	1.14
4	2,446	2,322	1.05	2,064	1,768	1.17
5	2,073	1,916	1.08	1,548	1,413	1.10
6-9	5,164	4,823	1.07	4,129	3,952	1.04
10-14	3,595	3,656	0.98	1,796	1,957	0.92
15-19	1,584	1,736	0.91	595	775	0.77
20-24	163	175	0.93	221	232	0.95
25-29	26	26	0.99	46	41	1.13
30+	2	3	0.61	7	5	1.32
Total	34,507	33,892	1.02	27,522	26,119	1.05

*Data summarized for years 1995-2015. Please see **Data** section for years omitted.

Not Eligible for Retirement						
SERS Termination Experience by Service Level New Assumptions*						
Service	Plan 2			Plan 3		
	Actual	Expected	A/E	Actual	Expected	A/E
0	6,192	5,373	1.15	4,619	4,131	1.12
1	6,101	5,779	1.06	6,047	5,933	1.02
2	4,073	4,153	0.98	3,793	3,834	0.99
3	3,088	3,145	0.98	2,657	2,786	0.95
4	2,446	2,313	1.06	2,064	2,004	1.03
5	2,073	2,122	0.98	1,548	1,675	0.92
6-9	5,164	5,015	1.03	4,129	4,402	0.94
10-14	3,595	3,454	1.04	1,796	1,836	0.98
15-19	1,584	1,585	1.00	595	697	0.85
20-24	163	157	1.04	221	205	1.08
25-29	26	16	1.60	46	25	1.81
30+	2	3	0.62	7	5	1.32
Total	34,507	33,114	1.04	27,522	27,533	1.00

*Data summarized for years 1995-2015. Please see **Data** section for years omitted.

THREE: APPENDICES

TERMINATION RATES

continued

SERS (continued)

Not Eligible for Retirement						
SERS Termination Experience by Year - Old Assumption						
	Plan 2 (Males and Females)			Plan 3 (Males and Females)		
Age	Actual	Expected	A/E	Actual	Expected	A/E
1995	3,333	3,516	0.95	0	0	N/A
1996	3,205	3,405	0.94	0	0	N/A
1997	3,580	3,491	1.03	0	0	N/A
1998	3,810	3,678	1.04	0	0	N/A
1999	4,136	3,703	1.12	0	0	N/A
2000	1,086	2,633	0.41	60	1,173	0.05
2001	2,074	2,130	0.97	1,400	1,779	0.79
2002	1,774	1,745	1.02	1,915	2,097	0.91
2003	1,558	1,455	1.07	2,476	2,344	1.06
2004	1,334	1,226	1.09	2,220	2,274	0.98
2005	1,318	1,081	1.22	2,533	2,380	1.06
2006	1,153	966	1.19	2,717	2,471	1.10
2007	749	879	0.85	1,857	2,558	0.73
2008	945	798	1.18	2,658	2,394	1.11
2009	996	1,078	0.92	1,962	2,145	0.91
2010	1,067	1,183	0.90	1,757	1,937	0.91
2011	1,056	1,192	0.89	1,805	1,770	1.02
2012	1,228	1,232	1.00	1,905	1,650	1.15
2013	1,162	1,245	0.93	1,706	1,529	1.12
2014	1,308	1,370	0.95	1,837	1,530	1.20
2015	1,544	1,528	1.01	2,031	1,597	1.27
Total	38,416	39,535	0.97	30,839	31,628	0.98

THREE: APPENDICES

TERMINATION RATES

continued

SERS (continued)

Not Eligible for Retirement								
SERS Termination Rates								
Service	Plan 2				Plan 3			
	Old	Female	Actual	New	Old	Female	Actual	New
	Male		Both	Both	Male		Both	Both
0	0.245	0.199	0.207	0.180	0.245	0.199	0.201	0.180
1	0.159	0.131	0.137	0.130	0.159	0.131	0.153	0.150
2	0.117	0.103	0.108	0.110	0.117	0.103	0.119	0.120
3	0.100	0.079	0.088	0.090	0.100	0.079	0.095	0.100
4	0.081	0.068	0.074	0.070	0.081	0.068	0.082	0.080
5	0.066	0.062	0.068	0.070	0.066	0.062	0.069	0.075
6	0.061	0.056	0.062	0.060	0.061	0.056	0.061	0.065
7	0.056	0.053	0.058	0.055	0.056	0.053	0.055	0.060
8	0.051	0.050	0.053	0.050	0.051	0.050	0.051	0.055
9	0.047	0.047	0.048	0.050	0.047	0.047	0.049	0.050
10	0.043	0.046	0.046	0.045	0.043	0.046	0.045	0.045
11	0.039	0.045	0.043	0.040	0.039	0.045	0.041	0.040
12	0.036	0.044	0.041	0.040	0.036	0.044	0.038	0.040
13	0.033	0.044	0.041	0.040	0.033	0.044	0.037	0.040
14	0.030	0.043	0.038	0.035	0.030	0.043	0.034	0.035
15	0.027	0.043	0.036	0.035	0.027	0.043	0.030	0.035
16	0.025	0.039	0.035	0.035	0.025	0.039	0.029	0.035
17	0.025	0.036	0.031	0.030	0.025	0.036	0.025	0.030
18	0.024	0.035	0.027	0.030	0.024	0.035	0.027	0.030
19	0.024	0.032	0.024	0.025	0.024	0.032	0.020	0.025
20	0.023	0.030	0.026	0.025	0.023	0.030	0.027	0.025
21	0.023	0.028	0.026	0.025	0.023	0.028	0.029	0.025
22	0.022	0.027	0.024	0.020	0.022	0.027	0.018	0.020
23	0.021	0.026	0.016	0.020	0.021	0.026	0.021	0.020
24	0.018	0.025	0.022	0.020	0.018	0.025	0.023	0.020
25	0.016	0.023	0.011	0.010	0.016	0.023	0.029	0.010
26	0.014	0.021	0.022	0.010	0.014	0.021	0.010	0.010
27	0.012	0.019	0.016	0.010	0.012	0.019	0.010	0.010
28	0.011	0.017	0.024	0.010	0.011	0.017	0.016	0.010
29	0.009	0.015	0.006	0.010	0.009	0.015	0.020	0.010
30+	0.008	0.014	0.006	0.010	0.008	0.014	0.013	0.010

THREE: APPENDICES

TERMINATION RATES

continued

PSERS

Not Eligible for Retirement			
PSERS 2 Termination Experience by Service Level			
Old Assumptions*			
Males and Females			
Service	Actual	Expected	A/E
0	472	576	0.82
1	506	656	0.77
2	342	357	0.96
3	220	230	0.96
4	188	172	1.09
5	134	137	0.98
6-9	294	273	1.08
10-14	157	138	1.13
15-19	85	61	1.39
20-24	25	14	1.78
25-29	3	2	1.76
30+	0	0	N/A
Total	2,426	2,616	0.93

**Data summarized for years 2008-2015.*

Not Eligible for Retirement			
PSERS 2 Termination Experience by Service Level			
New Assumptions*			
Males and Females			
Service	Actual	Expected	A/E
0	472	549	0.86
1	506	583	0.87
2	342	342	1.00
3	220	218	1.01
4	188	157	1.20
5	134	143	0.93
6-9	294	287	1.03
10-14	157	146	1.07
15-19	85	66	1.29
20-24	25	19	1.33
25-29	3	3	1.01
30+	0	0	N/A
Total	2,426	2,513	0.97

**Data summarized for years 2008-2015.*

THREE: APPENDICES

TERMINATION RATES

continued

PSERS (continued)

Not Eligible for Retirement			
PSERS Termination Experience by Year - Old Assumptions			
Plan 2 (Males and Females)			
Age	Actual	Expected	A/E
1995	0	0	N/A
1996	5	24	0.21
1997	10	26	0.38
1998	12	34	0.35
1999	14	39	0.36
2000	24	49	0.49
2001	20	50	0.40
2002	25	55	0.45
2003	24	64	0.38
2004	32	73	0.44
2005	54	86	0.63
2006	5	102	0.05
2007	82	169	0.49
2008	216	268	0.80
2009	302	444	0.68
2010	393	392	1.00
2011	294	316	0.93
2012	290	279	1.04
2013	272	278	0.98
2014	307	302	1.02
2015	352	338	1.04
Total	2,733	3,387	0.81

THREE: APPENDICES

TERMINATION RATES

continued

PSERS (continued)

Not Eligible for Retirement				
PSERS Termination Rates				
Plan 2				
Service	Old		Actual	New
	Male	Female	Both	Both
0	0.262	0.262	0.215	0.250
1	0.155	0.168	0.121	0.140
2	0.101	0.117	0.100	0.100
3	0.075	0.093	0.076	0.075
4	0.063	0.076	0.072	0.060
5	0.054	0.067	0.056	0.060
6	0.045	0.058	0.051	0.050
7	0.042	0.053	0.047	0.050
8	0.039	0.049	0.049	0.040
9	0.036	0.045	0.041	0.040
10	0.034	0.042	0.041	0.040
11	0.031	0.038	0.039	0.035
12	0.029	0.035	0.034	0.030
13	0.027	0.033	0.030	0.030
14	0.025	0.030	0.033	0.030
15	0.024	0.028	0.036	0.030
16	0.022	0.025	0.027	0.025
17	0.020	0.023	0.025	0.020
18	0.019	0.022	0.031	0.020
19	0.018	0.020	0.031	0.020
20	0.015	0.018	0.026	0.020
21	0.013	0.016	0.024	0.020
22	0.011	0.014	0.024	0.015
23	0.010	0.012	0.012	0.015
24	0.009	0.011	0.031	0.015
25	0.007	0.009	0.010	0.015
26	0.006	0.008	0.015	0.010
27	0.006	0.007	0.023	0.010
28	0.005	0.006	0.000	0.010
29	0.004	0.006	0.000	0.010
30+	0.004	0.005	0.000	0.010

THREE: APPENDICES

TERMINATION RATES

continued

LEOFF

Not Eligible for Retirement						
LEOFF 2 Termination Experience by Service Level						
Old Assumptions*						
Service	LEO (Males and Females)			FF (Males and Females)		
	Actual	Expected	A/E	Actual	Expected	A/E
0	571	442	1.29	164	272	0.60
1	485	391	1.24	184	286	0.64
2	228	186	1.22	86	144	0.60
3	194	145	1.34	59	114	0.52
4	159	144	1.11	50	112	0.45
5	191	137	1.40	49	106	0.46
6-9	628	464	1.35	180	360	0.50
10-14	501	386	1.30	161	321	0.50
15-19	261	231	1.13	91	194	0.47
20-24	108	68	1.58	37	58	0.64
25+	16	6	2.49	7	7	0.96
Total	3,342	2,601	1.28	1,068	1,975	0.54

*Data summarized for years 1995-2015. Please see **Data** section for years omitted.

Not Eligible for Retirement						
LEOFF 2 Termination Experience by Service Level						
New Assumptions*						
Service	LEO (Males and Females)			FF (Males and Females)		
	Actual	Expected	A/E	Actual	Expected	A/E
0	571	599	0.95	164	165	0.99
1	485	488	0.99	184	208	0.88
2	228	229	1.00	86	88	0.98
3	194	188	1.03	59	59	1.00
4	159	192	0.83	50	60	0.84
5	191	190	1.01	49	59	0.83
6-9	628	601	1.04	180	166	1.08
10-14	501	458	1.09	161	119	1.36
15-19	261	223	1.17	91	94	0.97
20-24	108	61	1.78	37	40	0.92
25+	16	7	2.31	7	8	0.83
Total	3,342	3,234	1.03	1,068	1,066	1.00

*Data summarized for years 1995-2015. Please see **Data** section for years omitted.

THREE: APPENDICES

TERMINATION RATES

continued

LEOFF (continued)

Not Eligible for Retirement												
LEOFF 2 Termination Experience by Year - Old Assumption												
Age	Plan 1 (LEO and FF)			Plan 2 (LEO)			Plan 2 (FF)			Plan 2 (LEO and FF)		
	Actual	Expected	A/E	Actual	Expected	A/E	Actual	Expected	A/E	Actual	Expected	A/E
1995	5	16	0.31	163	126	1.29	41	87	0.47	204	213	0.96
1996	10	13	0.75	174	135	1.29	39	87	0.45	213	222	0.96
1997	2	9	0.21	168	140	1.20	54	91	0.59	222	231	0.96
1998	1	7	0.14	197	140	1.41	53	96	0.55	250	236	1.06
1999	2	5	0.40	220	141	1.56	70	95	0.74	290	236	1.23
2000	5	3	1.45	230	155	1.49	65	103	0.63	295	257	1.15
2001	0	2	N/A	189	146	1.29	49	100	0.49	238	247	0.96
2002	1	2	0.62	175	146	1.20	65	113	0.58	240	259	0.93
2003	0	1	N/A	162	142	1.14	74	108	0.68	236	250	0.94
2004	0	0	N/A	202	145	1.39	60	113	0.53	262	258	1.01
2005	0	0	N/A	197	137	1.44	62	104	0.59	259	241	1.08
2006	0	0	N/A	206	142	1.45	55	107	0.51	261	250	1.04
2007	0	0	N/A	165	152	1.09	41	114	0.36	206	266	0.77
2008	0	0	N/A	195	154	1.27	70	122	0.57	265	276	0.96
2009	1	0	9.34	177	158	1.12	54	120	0.45	231	278	0.83
2010	0	0	N/A	145	142	1.02	54	118	0.46	199	261	0.76
2011	0	0	N/A	137	125	1.10	44	107	0.41	181	232	0.78
2012	0	0	N/A	137	115	1.19	60	102	0.59	197	217	0.91
2013	0	0	N/A	126	112	1.12	48	99	0.49	174	211	0.82
2014	0	0	N/A	164	119	1.38	44	99	0.44	208	218	0.95
2015	0	0	N/A	167	127	1.32	56	102	0.55	223	229	0.97
Total	27	60	0.45	3,696	2,899	1.27	1,158	2,189	0.53	4,854	5,088	0.95

THREE: APPENDICES

TERMINATION RATES

continued

LEOFF (continued)

Not Eligible for Retirement			
LEOFF 2 Termination Rates			
LEO and FF			
Males and Females			
Service	Old	Actual	New
0	0.107	0.110	0.105
1	0.048	0.048	0.050
2	0.024	0.023	0.025
3	0.019	0.019	0.020
4	0.019	0.015	0.020
5	0.018	0.018	0.020
6	0.017	0.018	0.020
7	0.017	0.017	0.015
8	0.016	0.014	0.015
9	0.015	0.016	0.015
10	0.015	0.015	0.015
11	0.014	0.014	0.010
12	0.014	0.012	0.010
13	0.013	0.011	0.010
14	0.012	0.011	0.010
15	0.012	0.010	0.010
16	0.011	0.009	0.010
17	0.010	0.007	0.010
18	0.010	0.007	0.010
19	0.009	0.008	0.010
20	0.008	0.011	0.010
21	0.008	0.007	0.005
22	0.007	0.007	0.005
23	0.006	0.008	0.005
24	0.006	0.007	0.005
25	0.005	0.009	0.005
26	0.004	0.006	0.005
27	0.004	0.006	0.005
28	0.003	0.010	0.005
29	0.002	0.000	0.005
30+	0.002	0.000	0.005

THREE: APPENDICES

TERMINATION RATES

continued

LEOFF (continued)

Not Eligible for Retirement			
LEOFF 2 Termination Experience by Service Level			
Old Assumptions*			
LEO and FF			
Service	Actual	Expected	A/E
0	735	714	1.03
1	669	677	0.99
2	314	330	0.95
3	253	259	0.98
4	209	256	0.82
5	240	243	0.99
6-9	808	824	0.98
10-14	662	708	0.94
15-19	352	425	0.83
20-24	145	126	1.15
25+	23	14	1.68
Total	4,410	4,576	0.96

*Data summarized for years 1995-2015.

Please see **Data** section for years omitted.

Not Eligible for Retirement			
LEOFF 2 Termination Experience by Service Level			
New Assumptions*			
LEO and FF			
Service	Actual	Expected	A/E
0	735	700	1.05
1	669	704	0.95
2	314	337	0.93
3	253	268	0.94
4	209	273	0.76
5	240	269	0.89
6-9	808	818	0.99
10-14	662	578	1.15
15-19	352	411	0.86
20-24	145	112	1.30
25+	23	15	1.49
Total	4,410	4,485	0.98

*Data summarized for years 1995-2015.

Please see **Data** section for years omitted.

THREE: APPENDICES

TERMINATION RATES

continued

WSPRS

Not Eligible for Retirement			
WSPRS 1/2 Termination Experience by Service Level			
Old Assumptions*			
Males and Females			
Service	Actual	Expected	A/E
0	9	9	1.02
1	5	6	0.82
2	8	12	0.67
3	22	16	1.42
4	15	17	0.89
5	21	17	1.25
6-9	60	54	1.11
10-14	34	39	0.86
15-19	21	18	1.19
20-24	7	8	0.89
25+	0	0	N/A
Total	202	195	1.04

*Data summarized for years 1995-2013.

Please see **Data** section for years omitted.

Not Eligible for Retirement			
WSPRS 1/2 Termination Experience by Service Level			
New Assumptions*			
Males and Females			
Service	Actual	Expected	A/E
0	9	9	0.96
1	5	6	0.82
2	8	12	0.67
3	22	16	1.42
4	15	17	0.89
5	21	17	1.25
6-9	60	56	1.07
10-14	34	36	0.95
15-19	21	17	1.25
20-24	7	12	0.60
25+	0	0	N/A
Total	202	197	1.02

*Data summarized for years 1995-2013.

Please see **Data** section for years omitted.

THREE: APPENDICES

TERMINATION RATES

continued

WSPRS (continued)

Not Eligible for Retirement									
WSPRS Termination Experience by Year - Old Assumption									
Age	Plan 1 (Males & Females)			Plan 2 (Males and Females)			All Plans		
	Actual	Expected	A/E	Actual	Expected	A/E	Actual	Expected	A/E
1995	9	11	0.78	0	0	N/A	9	11	0.78
1996	9	10	0.92	0	0	N/A	9	10	0.92
1997	8	11	0.71	0	0	N/A	8	11	0.71
1998	10	10	0.97	0	0	N/A	10	10	0.97
1999	10	10	0.97	0	0	N/A	10	10	0.97
2000	13	11	1.17	0	0	N/A	13	11	1.17
2001	9	13	0.72	0	0	N/A	9	13	0.72
2002	16	14	1.18	0	0	N/A	16	14	1.18
2003	8	12	0.65	0	0	N/A	8	12	0.65
2004	16	12	1.30	1	1	1.06	17	13	1.29
2005	17	11	1.52	0	1	N/A	17	12	1.37
2006	17	10	1.69	0	2	N/A	17	12	1.45
2007	7	9	0.78	5	2	2.14	12	11	1.06
2008	16	8	1.97	2	3	0.66	18	11	1.61
2009	8	7	1.13	3	6	0.53	11	13	0.86
2010	2	6	0.32	6	5	1.13	8	12	0.69
2011	4	5	0.74	7	5	1.32	11	11	1.03
2012	10	5	2.14	4	6	0.68	14	11	1.32
2013	0	4	N/A	6	7	0.91	6	11	0.57
2014	8	3	2.35	11	7	1.51	19	11	1.77
2015	4	3	1.41	28	8	3.71	32	10	3.08
Total	201	187	1.08	73	53	1.38	274	240	1.14

THREE: APPENDICES

TERMINATION RATES

continued

WSPRS (continued)

Not Eligible for Retirement			
WSPRS Termination Rates			
Plans 1/2			
Males and Females			
Service	Old	Actual	New
0	0.042	0.043	0.045
1	0.020	0.016	0.020
2	0.020	0.013	0.020
3	0.020	0.028	0.020
4	0.020	0.018	0.020
5	0.020	0.025	0.020
6	0.019	0.023	0.020
7	0.017	0.013	0.020
8	0.016	0.022	0.015
9	0.015	0.016	0.015
10	0.013	0.009	0.010
11	0.012	0.008	0.010
12	0.011	0.013	0.010
13	0.010	0.001	0.010
14	0.009	0.016	0.010
15	0.008	0.008	0.010
16	0.007	0.005	0.005
17	0.006	0.007	0.005
18	0.006	0.012	0.005
19	0.005	0.006	0.005
20	0.004	0.000	0.005
21	0.004	0.002	0.005
22	0.003	0.004	0.005
23	0.003	0.006	0.005
24	0.002	0.003	0.005
25+	0.000	0.000	0.000

THREE: APPENDICES

TERMINATION RATES

continued

Eligible for Retirement

For the Plans 2/3, Plan 2 and Plan 3 termination rates were developed using a combined history of PERS, TRS, and SERS (Plans 2/3).

Eligible for Retirement						
Plans 2/3 Termination Experience by Age						
Old Assumptions*						
Age	Plan 2			Plan 3		
	Actual	Expected	A/E	Actual	Expected	A/E
55	224	0	0.00	793	0	0.00
56	256	0	0.00	753	0	0.00
57	232	0	0.00	761	0	0.00
58	240	0	0.00	771	0	0.00
59	237	0	0.00	835	0	0.00
60	263	0	0.00	719	0	0.00
61	244	0	0.00	743	0	0.00
62	216	0	0.00	715	0	0.00
63	129	0	0.00	333	0	0.00
64	18	0	0.00	57	0	0.00
65+	311	0	0.00	234	0	0.00
Total	2,370	0	0.00	6,714	0	0.00

*Data summarized for years 1995-2015. Please see **Data** section for years omitted.

Eligible for Retirement						
Plans 2/3 Termination Experience by Age						
New Assumptions*						
Age	Plan 2			Plan 3		
	Actual	Expected	Ratio	Actual	Expected	Ratio
55	224	255	0.88	793	789	1.00
56	256	258	0.99	753	748	1.01
57	232	258	0.90	761	705	1.08
58	240	251	0.96	771	649	1.19
59	237	243	0.98	835	879	0.95
60	263	236	1.11	719	767	0.94
61	244	224	1.09	743	666	1.12
62	216	201	1.08	715	665	1.07
63	129	58	2.23	333	184	1.81
64	18	60	0.30	57	70	0.81
65+	311	0	0.00	234	0	0.00
Total	2,370	2,042	1.16	6,714	6,124	1.10

*Data summarized for years 1995-2015. Please see **Data** section for years omitted.

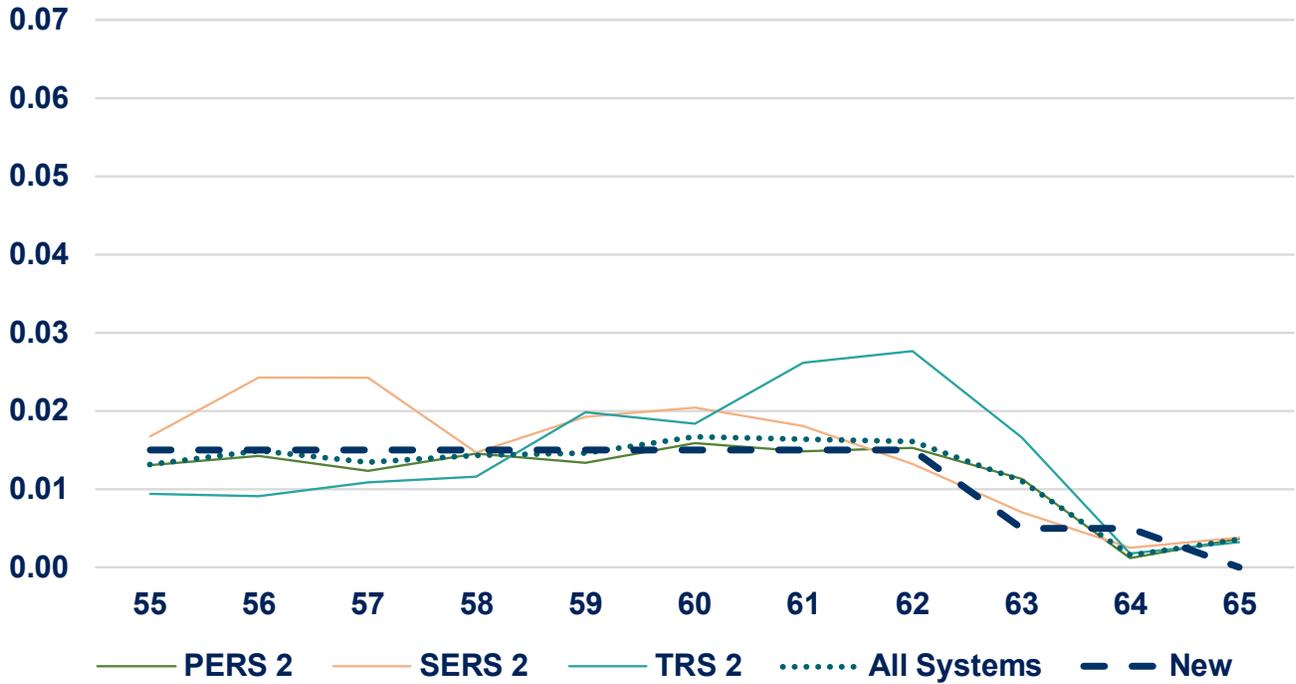
For Plan 2 and Plan 3, we observed similar behavioral trends for Plans 2/3 members who are eligible for retirement. The following graphs summarize the observed Plan 2 and Plan 3 experience, by plan, as well as the new assumption.

THREE: APPENDICES

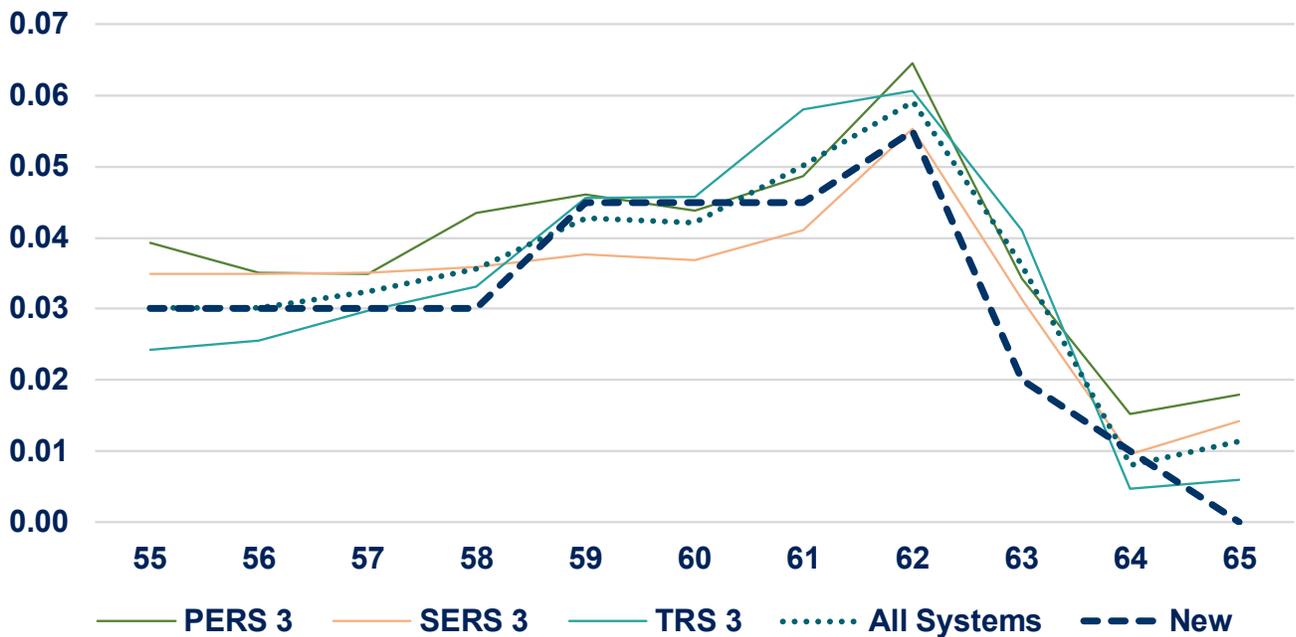
TERMINATION RATES

continued

Eligible for Retirement Termination - Plan 2



Eligible for Retirement Termination - Plan 3



THREE: APPENDICES

TERMINATION RATES

continued

The following table displays the termination experience for Public Safety Plan members eligible for retirement.

Eligible for Retirement									
Public Safety Plans Termination Rates									
Age	LEOFF 2			WSPRS 1/2			PSERS 2		
	Old	Actual	New	Old	Actual	New	Old	Actual	New
50	0.000	0.007	0.000	0.000	0.000	0.000	N/A	N/A	N/A
51	0.000	0.004	0.000	0.000	0.000	0.000	N/A	N/A	N/A
52	0.000	0.001	0.000	0.000	0.000	0.000	N/A	N/A	N/A
53	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.019	0.015
54	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.019	0.015
55	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.035	0.015
56	0.000	0.003	0.000	0.000	0.008	0.000	0.000	0.015	0.015
57	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.018	0.015
58	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.012	0.015
59	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.016	0.015
60+	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.024	0.000