

THREE: APPENDICES

SERVICE-BASED SALARY INCREASE

Methodology

We receive salary data annually on a total salary basis. In order to estimate SBS increases we need to reduce total salary by estimates for GSG (or the summation of inflation and real wage growth). We develop assumptions for future GSG as part of our economic experience study. These assumptions, however, are forward-looking and may not be consistent with historical experience.

Inflation

To determine historical inflation, we use the BLS Seattle-Tacoma-Bremerton CPI (renamed in 2018 to Seattle-Tacoma-Bellevue) for Urban Wage Earners & Clerical Workers. The CPI measures a weighted average price of a basket of consumer goods and services, such as transportation, food and medical care. Yearly inflation is calculated by taking the increase in CPI from one year to the next.

We considered two methods for estimating an inflation rate appropriate for our study period:

1. Take the geometric average of historical inflation over our entire study period (1995-2017).
2. Use a weighted geometric average of historical inflation over our study period (1995-2017). The weights were assigned based on the active member headcounts in the given year. This method gives more weights to the inflation occurring in the years when more members worked.

The following table summarizes annual experienced inflation by system under our two methods from 1995-2017.

Inflation from 1995 (or Plan Inception) to 2017			
System	Weighted	Unweighted	Difference
PERS	2.53%	2.55%	(0.02%)
TRS	2.53%	2.55%	(0.02%)
SERS	2.44%	2.55%	(0.11%)
LEOFF	2.51%	2.55%	(0.04%)
WSPRS	2.53%	2.55%	(0.02%)
PSERS	2.14%	2.37%	(0.24%)
All Systems	2.50%	2.55%	(0.04%)

Real Wage Growth

Real wage growth, or the overall economic growth in wages above inflation, can be a difficult figure to isolate. These increases are experienced by the population as a whole, and are independent of individual member service or performance. We can estimate historical real wage growth by measuring how average salaries have increased as a whole above inflation. The average annual salary changes removes some of the impact from SBS growth. Specifically, we examined the yearly increase, or decrease, in average salaries above inflation to determine an estimation for yearly real wage growth.

This measurement, however, represents an approximation and is sensitive to population changes. The approximation improves when a population remains stable and enough data is available. For example, if the average age and years of service for active members remain constant from one year to the next, we can approximate GSG in that year with less influence from SBS increases. In reality, most retirement plans mature with average ages and service levels increasing over time. As such, we examined a range of the possible real wage growth experienced by system based on our estimation.

Ultimately, we settled on a range of reasonable historical real wage growth that varied by system anywhere from 0.00 percent to 1.50 percent. We used this range when selecting our new SBS rates.

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Review of Key Demographic Factors

We reviewed several demographic factors and considered alternate formats for this assumption, but ultimately decided not to make any changes. For reference, we considered, but did not adopt:

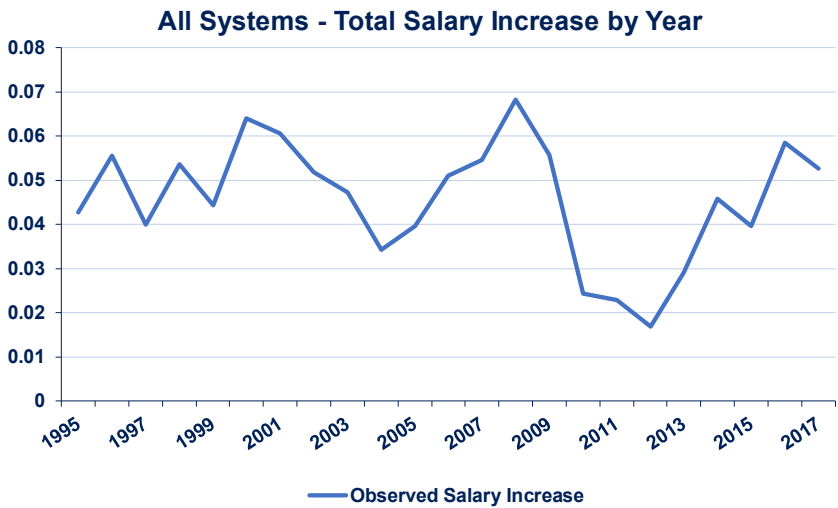
- ❖ **Salary Increases by Age.**
We think salary is more strongly tied to service than to age, so we chose not to use age-based salary increase assumptions.
- ❖ **Salary Increase Assumptions by Plan.**
We studied the total salary increase at each service level for Plans 2/3 and observed similar salary increase trends. Based on this observation, we don't believe plan selection is correlated with future salary increases. Likewise, we don't believe Plans 1 would have different SBS trends than Plans 2/3.
- ❖ **Salary Increase Assumptions by Gender.**
We studied the total salary increases by valuation year, for males and females, and observed similar increases.
- ❖ **Lagged Inflation.**
We considered implementing a lagged (or delayed) inflation to observe whether inflation had a delayed effect on salary. We did not find a consistently stronger correlation between lagged inflation and salary increase than non-lagged inflation and salary increase. The correlation between inflation and total salary increase under different time lags is illustrated in the following table for PERS.

PERS All Plans	
Correlation of Salary Increase & Inflation	
3 Years Lagged	0.02
2 Years Lagged	0.37
1 Year Lagged	0.51
No Lag	0.54

Analysis

Historical Data

We observed total salary increases by year for all active employees. As illustrated in the graph below, total salary increases can fluctuate quite significantly year-to-year. We estimate most of this volatility is due to economic, rather than demographic, changes. For instance, we observed a decline in salary following the Great Recession (2008-2009).



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Inflation

We have observed a downward trend in inflation in more recent years. Generally, we expect times of low inflation to decrease total salary growth and times of high inflation to increase total salary growth.

Historical Inflation	
Time Period	Annual Increase
1995-1999	3.0%
2000-2004	2.4%
2005-2009	3.1%
2010-2014	1.9%
2015-2017	2.2%

When determining the range of historical SBS increases we used the unweighted historical inflation over our study period.

Real Wage Growth

The observed real wage growth ranges are generally lower than expected over the 1995-2017 study period with the exception of the public safety plans. This is primarily driven by the inclusion of Great Recession data and the approximate nature of the measurement. Our current assumption for future real wage growth is 0.75 percent. Please see the [2019 Economic Experience Study](#) for more information. We used the ranges of historical real wage growth in the following table to isolate SBS increases.

1995-2017 Annual Real Wage Growth		
System	High Estimate	Low Estimate
PERS	0.8%	0.0%
TRS	0.5%	0.0%
SERS	0.5%	0.0%
LEOFF	1.5%	0.7%
PSERS	0.9%	0.1%
WSPRS	1.2%	0.4%

SBS Increases

Using our estimates of inflation and real wage growth, we developed a range of historical SBS increases by service level from 1995-2017. We determined low and high estimates for SBS increases by dividing the historical total salary increases by the estimated GSG. For example, members of PERS with four years of service credit had an average total salary increase of 6.0 percent. To determine the lower range of the SBS we divided by the highest estimates for GSG (inflation = 2.55 percent, real wage growth estimation = 0.80 percent). Our lowest estimate for SBS increases would therefore be:

(1+6%)

(1+0.80%+2.55%)

- 1 = 2.6%.

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PERS

Generally, we found PERS actual SBS increases match expected increases fairly closely. We relied on PERS experience to set rates for PSERS. Please see the **New Assumption** section for more information.

PERS—All Plans				
Total Salary Increase		SBS Increase Portion		
Service Level	Historical	Low Estimate	High Estimate	Old Assumption
1	0.094	0.059	0.067	0.060
2	0.078	0.043	0.052	0.047
3	0.068	0.034	0.042	0.036
4	0.060	0.026	0.034	0.029
5	0.054	0.020	0.028	0.022
10	0.038	0.005	0.013	0.005
15	0.035	0.002	0.010	0.002
20	0.031	0.000	0.005	0.000
25	0.030	0.000	0.005	0.000
30	0.030	0.000	0.005	0.000

TRS

We saw higher than expected SBS increases across most service levels, particularly for new members and those with ten to fifteen years of service.

TRS—All Plans				
Total Salary Increase		SBS Increase Portion		
Service Level	Historical	Low Estimate	High Estimate	Old Assumption
1	0.087	0.055	0.060	0.051
2	0.067	0.036	0.041	0.039
3	0.067	0.035	0.041	0.039
4	0.065	0.033	0.038	0.035
5	0.062	0.031	0.036	0.030
10	0.057	0.026	0.031	0.022
15	0.044	0.013	0.018	0.009
20	0.029	0.000	0.004	0.001
25	0.028	0.000	0.003	0.001
30	0.028	0.000	0.002	0.000

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SERS

The SBS increases for SERS were historically higher than expected across most service levels, particularly at the start of members' careers.

SERS—All Plans				
Total Salary Increase		SBS Increase Portion		
Service Level	Historical	Low Estimate	High Estimate	Old Assumption
1	0.127	0.094	0.100	0.066
2	0.073	0.041	0.047	0.039
3	0.062	0.031	0.037	0.028
4	0.055	0.023	0.029	0.023
5	0.052	0.021	0.027	0.021
10	0.042	0.011	0.017	0.009
15	0.039	0.008	0.014	0.002
20	0.031	0.001	0.006	0.001
25	0.032	0.001	0.007	0.000
30	0.031	0.001	0.006	0.000

LEOFF

Generally, we found LEOFF actual SBS increases match expected increases fairly closely. SBS increases were historically marginally higher than expected in early years and lower than expected for members with around ten years of service.

LEOFF—All Plans				
Total Salary Increase		SBS Increase Portion		
Service Level	Historical	Low Estimate	High Estimate	Old Assumption
1	0.150	0.105	0.114	0.107
2	0.109	0.066	0.074	0.075
3	0.090	0.048	0.056	0.059
4	0.071	0.029	0.037	0.037
5	0.059	0.017	0.026	0.026
10	0.048	0.007	0.015	0.017
15	0.047	0.007	0.015	0.012
20	0.043	0.003	0.011	0.010
25	0.040	0.000	0.007	0.005
30	0.035	0.000	0.003	0.000

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WSPRS

Due to recent legislative changes in WSPRS, we believe historical experience is no longer a good indicator of future experience. As part of our [2016 Actuarial Valuation Report](#), we updated the WSPRS SBS scale to mirror the LEOFF scale. For more information on recent legislation, please see the **Law Changes** section.

For informational purposes only, the SBS increases for WSPRS were generally higher than expected in early and late career service levels and lower than expected during mid-career service levels using the SBS rates developed as part of the 2007-2012 Demographic Experience Study.

WSPRS—All Plans				
Total Salary Increase		SBS Increase Portion		
Service Level	Historical	Low Estimate	High Estimate	Old Assumption*
1	0.169	0.127	0.136	0.107
2	0.121	0.081	0.090	0.075
3	0.093	0.053	0.062	0.059
4	0.089	0.050	0.058	0.037
5	0.088	0.049	0.057	0.026
10	0.038	0.001	0.009	0.017
15	0.038	0.001	0.009	0.012
20	0.041	0.004	0.012	0.010
25	0.043	0.005	0.013	0.005
30	0.047	0.009	0.017	0.000

**As part of the 2016 Actuarial Valuation Report, these rates were set equal to LEOFF to reflect passed legislation impacting salaries (C 28 L16).*

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New Assumptions

PERS

We found our prior SBS increase rates were generally too low and stopped too early in a member's career. Therefore, we extended the scale and increased our assumed SBS increase rates at most service levels.

PERS Service-Based Salary Increase					
Service Level	Historical Rates		Assumed Rates		
	Low Estimate	High Estimate	Old	New	Change
1	0.059	0.067	0.060	0.060	0.000
2	0.043	0.052	0.047	0.045	(0.002)
3	0.034	0.042	0.036	0.037	0.001
4	0.026	0.034	0.029	0.030	0.001
5	0.020	0.028	0.022	0.022	0.000
6	0.015	0.023	0.015	0.017	0.002
7	0.011	0.019	0.012	0.015	0.003
8	0.009	0.017	0.009	0.010	0.001
9	0.007	0.015	0.007	0.010	0.003
10	0.005	0.013	0.005	0.007	0.002
11	0.003	0.011	0.004	0.005	0.001
12	0.002	0.010	0.003	0.005	0.002
13	0.001	0.009	0.003	0.005	0.002
14	0.001	0.009	0.002	0.003	0.001
15	0.002	0.010	0.002	0.003	0.001
16	0.001	0.009	0.002	0.003	0.001
17	0.001	0.009	0.001	0.003	0.002
18	0.000	0.007	0.000	0.001	0.001
19	0.000	0.006	0.000	0.001	0.001
20	0.000	0.005	0.000	0.001	0.001
21+	0.000	0.005	0.000	0.000	0.000

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TRS

We anticipate total salary increases for TRS members will be volatile in the short term due to the *McCleary v. State of Washington* decision. Long term, we anticipate our historical experience to continue to be a good indication of future experience but expect the salary increases to be marginally higher. We will continue to monitor this assumption for reasonableness as we acquire more data coming out of the *McCleary* decision.

Our new rates for TRS are notably higher for new members and members with five to seventeen years of service.

TRS Service-Based Salary Increase					
Service Level	Historical Rates		Assumed Rates		
	Low Estimate	High Estimate	Old	New	Change
1	0.055	0.060	0.051	0.055	0.004
2	0.036	0.041	0.039	0.037	(0.002)
3	0.035	0.041	0.039	0.037	(0.002)
4	0.033	0.038	0.035	0.035	0.000
5	0.031	0.036	0.030	0.032	0.002
6	0.029	0.034	0.027	0.030	0.003
7	0.030	0.036	0.027	0.030	0.003
8	0.031	0.036	0.026	0.030	0.004
9	0.028	0.033	0.024	0.030	0.006
10	0.026	0.031	0.022	0.027	0.005
11	0.024	0.029	0.020	0.025	0.005
12	0.020	0.025	0.018	0.022	0.004
13	0.019	0.024	0.015	0.020	0.005
14	0.015	0.020	0.012	0.017	0.005
15	0.013	0.018	0.009	0.015	0.006
16	0.008	0.013	0.005	0.010	0.005
17	0.002	0.008	0.002	0.005	0.003
18	0.001	0.006	0.001	0.002	0.001
19	0.000	0.005	0.001	0.001	0.000
20	0.000	0.004	0.001	0.001	0.000
21	0.000	0.004	0.001	0.001	0.000
22	0.000	0.004	0.001	0.001	0.000
23	0.000	0.005	0.001	0.001	0.000
24	0.000	0.004	0.001	0.001	0.000
25	0.000	0.003	0.001	0.001	0.000
26+	0.000	0.004	0.000	0.000	0.000

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SERS

Overall, we found our old rates were too low over all service levels. Based on observed SBS and expectations for future salary changes, we increased most of the SBS rates for SERS.

SERS Service-Based Salary Increase					
Historical Rates			Assumed Rates		
Service Level	Low Estimate	High Estimate	Old	New	Change
1	0.094	0.100	0.066	0.080	0.014
2	0.041	0.047	0.039	0.040	0.001
3	0.031	0.037	0.028	0.030	0.002
4	0.023	0.029	0.023	0.025	0.002
5	0.021	0.027	0.021	0.020	(0.001)
6	0.017	0.023	0.016	0.017	0.001
7	0.015	0.021	0.012	0.015	0.003
8	0.015	0.021	0.012	0.015	0.003
9	0.013	0.019	0.009	0.012	0.003
10	0.011	0.017	0.009	0.012	0.003
11	0.009	0.015	0.007	0.010	0.003
12	0.006	0.012	0.005	0.005	0.000
13	0.006	0.012	0.004	0.007	0.003
14	0.006	0.012	0.003	0.007	0.004
15	0.008	0.014	0.002	0.007	0.005
16	0.005	0.010	0.002	0.005	0.003
17	0.004	0.010	0.002	0.005	0.003
18	0.003	0.009	0.002	0.002	0.000
19	0.004	0.010	0.001	0.002	0.001
20	0.001	0.006	0.001	0.001	0.000
21+	0.001	0.007	0.000	0.000	0.000

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PSERS

PSERS was created on July 1, 2006, and eligible members of PERS were given the option to transfer. The data we have for PSERS is rather limited due to the plan's relatively short history. Therefore, we set our PSERS rates equal to PERS. We reviewed the rates for reasonableness using the limited PSERS data available and found similar rates of SBS increases between the two systems.

Please see the **PERS** section for more information on the old and new PSERS rates.

LEOFF

Generally, we found our prior assumption close to actual experience over our study period. We only made minor adjustments to our new rates for LEOFF.

LEOFF Service-Based Salary Increase					
Historical Rates			Assumed Rates		
	Low Estimate	High Estimate	Old	New	Change
1	0.105	0.114	0.107	0.110	0.003
2	0.066	0.074	0.075	0.075	0.000
3	0.048	0.056	0.059	0.060	0.001
4	0.029	0.037	0.037	0.040	0.003
5	0.017	0.026	0.026	0.025	(0.001)
6	0.008	0.017	0.018	0.020	0.002
7	0.002	0.011	0.014	0.015	0.001
8	0.002	0.010	0.013	0.010	(0.003)
9	0.002	0.010	0.012	0.010	(0.002)
10	0.007	0.015	0.017	0.015	(0.002)
11	0.002	0.010	0.012	0.010	(0.002)
12	0.002	0.010	0.012	0.010	(0.002)
13	0.000	0.008	0.012	0.010	(0.002)
14	0.003	0.011	0.012	0.010	(0.002)
15	0.007	0.015	0.012	0.015	0.003
16	0.000	0.008	0.010	0.010	0.000
17	0.001	0.009	0.010	0.010	0.000
18	0.000	0.008	0.010	0.010	0.000
19	0.000	0.009	0.010	0.010	0.000
20	0.003	0.011	0.010	0.010	0.000
21	0.000	0.005	0.005	0.005	0.000
22	0.000	0.005	0.005	0.005	0.000
23	0.000	0.005	0.005	0.005	0.000
24	0.000	0.006	0.005	0.005	0.000
25	0.000	0.007	0.005	0.005	0.000
26+	0.000	0.003	0.000	0.000	0.000

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WSPRS

We expect recent legislative changes will impact future WSPRS salaries. We will not know the full impact of these legislative changes for a few years. However, we anticipate future WSPRS SBS increases will be more similar to LEOFF SBS increases than historical rates. As such, we set our new WSPRS rates equal to LEOFF.

WSPRS Service-Based Salary Increase			
Assumed Rates			
Service Level	Old*	New	Change
1	0.000	0.000	0.000
2	0.000	0.000	0.000
3	0.000	0.000	0.000
4	0.000	0.000	0.000
5	0.000	0.000	0.000
6	0.000	0.000	0.000
7	0.000	0.000	0.000
8	0.000	0.000	0.000
9	0.000	0.000	0.000
10	0.000	0.000	0.000
11	0.000	0.000	0.000
12	0.000	0.000	0.000
13	0.000	0.000	0.000
14	0.000	0.000	0.000
15	0.000	0.000	0.000
16	0.000	0.000	0.000
17	0.000	0.000	0.000
18	0.000	0.000	0.000
19	0.000	0.000	0.000
20	0.000	0.000	0.000
21	0.000	0.000	0.000
22	0.000	0.000	0.000
23	0.000	0.000	0.000
24	0.000	0.000	0.000
25	0.000	0.000	0.000
26+	0.000	0.000	0.000

**This assumption was updated as part of the 2016 Actuarial Valuation Report to reflect passed legislation impacting salaries (C 28 L1 6).*

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Exhibits

Actual to Expected Total Salary Increases from 1995-2017

The following tables illustrate the actual total average salary increases experienced from 1995-2017 by service level compared to our expected total salary increases under our old and new SBS increase assumptions. We calculate the old expected value using the SBS increase assumptions developed during the *2007-2012 Demographic Experience Study* along with our 3.5 percent assumed GSG developed as part of the *2019 Economic Experience Study*. We calculate the new expected value using the SBS increase assumptions developed in this report along with the same GSG.

When determining total salary growth, we look at both historical experience and expectations for the future. Therefore, the following tables can inform if our assumptions are reasonable, but it does not necessarily determine the best estimate projections for the future.

PERS Total Salary Increase					
Service Level	Actual	Old Expected	Old A/E	New Expected	New A/E
1	0.094	0.097	0.970	0.097	0.970
2	0.078	0.084	0.936	0.082	0.960
3	0.068	0.072	0.943	0.073	0.930
4	0.060	0.065	0.927	0.066	0.912
5	0.054	0.058	0.938	0.058	0.938
6	0.049	0.051	0.962	0.053	0.924
7	0.045	0.047	0.951	0.051	0.893
8	0.043	0.044	0.970	0.045	0.948
9	0.041	0.042	0.966	0.045	0.900
10	0.038	0.040	0.955	0.042	0.908
11	0.036	0.039	0.932	0.040	0.908
12	0.035	0.038	0.928	0.040	0.880
13	0.034	0.038	0.904	0.040	0.858
14	0.035	0.037	0.935	0.038	0.910
15	0.035	0.037	0.953	0.038	0.927
16	0.035	0.037	0.944	0.038	0.919
17	0.035	0.036	0.962	0.038	0.909
18	0.033	0.035	0.930	0.036	0.903
19	0.032	0.035	0.901	0.036	0.875
20	0.031	0.035	0.880	0.036	0.855
21	0.031	0.035	0.883	0.035	0.883
22	0.030	0.035	0.866	0.035	0.866
23	0.031	0.035	0.891	0.035	0.891
24	0.031	0.035	0.896	0.035	0.896
25	0.030	0.035	0.864	0.035	0.864
26	0.030	0.035	0.871	0.035	0.871
27	0.030	0.035	0.848	0.035	0.848
28	0.031	0.035	0.893	0.035	0.893
29	0.031	0.035	0.895	0.035	0.895
30	0.030	0.035	0.858	0.035	0.858

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Service Level	TRS Total Salary Increase				
	Actual	Old Expected	Old A/E	New Expected	New A/E
1	0.087	0.088	0.988	0.092	0.943
2	0.067	0.075	0.894	0.073	0.919
3	0.067	0.075	0.888	0.073	0.913
4	0.065	0.071	0.907	0.071	0.907
5	0.062	0.066	0.938	0.068	0.910
6	0.061	0.063	0.964	0.066	0.919
7	0.062	0.063	0.982	0.066	0.936
8	0.063	0.062	1.010	0.066	0.946
9	0.059	0.060	0.983	0.066	0.891
10	0.057	0.058	0.986	0.063	0.905
11	0.055	0.056	0.988	0.061	0.904
12	0.051	0.054	0.960	0.058	0.891
13	0.050	0.051	0.982	0.056	0.890
14	0.046	0.047	0.973	0.053	0.877
15	0.044	0.044	0.988	0.051	0.867
16	0.038	0.040	0.955	0.045	0.846
17	0.033	0.037	0.891	0.040	0.822
18	0.031	0.036	0.874	0.037	0.849
19	0.031	0.036	0.854	0.036	0.854
20	0.029	0.036	0.812	0.036	0.812
21	0.030	0.036	0.821	0.036	0.821
22	0.029	0.036	0.814	0.036	0.814
23	0.030	0.036	0.843	0.036	0.843
24	0.030	0.036	0.830	0.036	0.830
25	0.028	0.036	0.789	0.036	0.789
26	0.029	0.035	0.838	0.035	0.838
27	0.030	0.035	0.843	0.035	0.843
28	0.031	0.035	0.895	0.035	0.895
29	0.032	0.035	0.916	0.035	0.916
30	0.028	0.035	0.792	0.035	0.792

THREE: APPENDICES

SERVICE-BASED SALARY INCREASE

continued

SERS Total Salary Increase					
Service Level	Actual	Old Expected	Old A/E	New Expected	New A/E
1	0.127	0.103	1.229	0.118	1.078
2	0.073	0.075	0.964	0.076	0.951
3	0.062	0.064	0.970	0.066	0.940
4	0.055	0.059	0.927	0.061	0.896
5	0.052	0.057	0.914	0.056	0.931
6	0.048	0.052	0.936	0.053	0.917
7	0.046	0.047	0.968	0.051	0.908
8	0.046	0.047	0.966	0.051	0.906
9	0.043	0.044	0.981	0.047	0.917
10	0.042	0.044	0.947	0.047	0.885
11	0.040	0.042	0.940	0.045	0.876
12	0.037	0.040	0.913	0.040	0.913
13	0.037	0.039	0.944	0.042	0.875
14	0.037	0.038	0.969	0.042	0.874
15	0.039	0.037	1.039	0.042	0.911
16	0.035	0.037	0.948	0.040	0.874
17	0.035	0.037	0.938	0.040	0.866
18	0.034	0.037	0.919	0.037	0.919
19	0.034	0.036	0.950	0.037	0.923
20	0.031	0.036	0.861	0.036	0.861
21	0.031	0.035	0.888	0.035	0.888
22	0.030	0.035	0.869	0.035	0.869
23	0.032	0.035	0.902	0.035	0.902
24	0.032	0.035	0.917	0.035	0.917
25	0.032	0.035	0.910	0.035	0.910
26	0.031	0.035	0.879	0.035	0.879
27	0.030	0.035	0.867	0.035	0.867
28	0.029	0.035	0.825	0.035	0.825
29	0.026	0.035	0.753	0.035	0.753
30	0.031	0.035	0.886	0.035	0.886

THREE: APPENDICES

SERVICE-BASED SALARY INCREASE

continued

PSERS Total Salary Increase*					
Service Level	Actual	Old Expected	Old A/E	New Expected	New A/E
1	0.101	0.097	1.035	0.097	1.035
2	0.073	0.084	0.868	0.082	0.890
3	0.059	0.072	0.817	0.073	0.806
4	0.050	0.065	0.773	0.066	0.761
5	0.047	0.058	0.812	0.058	0.812
6	0.044	0.051	0.870	0.053	0.836
7	0.036	0.047	0.757	0.051	0.710
8	0.036	0.044	0.823	0.045	0.804
9	0.043	0.042	1.020	0.045	0.950
10	0.032	0.040	0.802	0.042	0.763
11	0.032	0.039	0.810	0.040	0.789
12	0.031	0.038	0.819	0.040	0.776
13	0.030	0.038	0.789	0.040	0.748
14	0.030	0.037	0.802	0.038	0.780
15	0.028	0.037	0.749	0.038	0.729
16	0.028	0.037	0.761	0.038	0.741
17	0.032	0.036	0.879	0.038	0.831
18	0.028	0.035	0.791	0.036	0.768
19	0.028	0.035	0.807	0.036	0.783
20	0.021	0.035	0.598	0.036	0.581
21	0.026	0.035	0.734	0.035	0.734
22	0.026	0.035	0.737	0.035	0.737
23	0.026	0.035	0.757	0.035	0.757
24	0.023	0.035	0.666	0.035	0.666
25	0.030	0.035	0.862	0.035	0.862

Note: Complete salary data for PSERS is only available from 2008 onwards. Due to the age of the plan, there is limited data for members with higher service levels.

THREE: APPENDICES

SERVICE-BASED SALARY INCREASE

continued

LEOFF Total Salary Increase					
Service Level	Actual	Old Expected	Old A/E	New Expected	New A/E
1	0.150	0.146	1.026	0.149	1.005
2	0.109	0.113	0.966	0.113	0.966
3	0.090	0.096	0.938	0.097	0.928
4	0.071	0.073	0.965	0.076	0.926
5	0.059	0.062	0.945	0.061	0.961
6	0.049	0.054	0.919	0.056	0.885
7	0.043	0.049	0.869	0.051	0.851
8	0.043	0.048	0.883	0.045	0.944
9	0.042	0.047	0.890	0.045	0.931
10	0.048	0.053	0.904	0.051	0.941
11	0.042	0.047	0.889	0.045	0.929
12	0.042	0.047	0.895	0.045	0.935
13	0.040	0.047	0.849	0.045	0.888
14	0.043	0.047	0.911	0.045	0.953
15	0.047	0.047	0.996	0.051	0.935
16	0.040	0.045	0.884	0.045	0.884
17	0.041	0.045	0.908	0.045	0.908
18	0.041	0.045	0.896	0.045	0.896
19	0.041	0.045	0.903	0.045	0.903
20	0.043	0.045	0.955	0.045	0.955
21	0.038	0.040	0.937	0.040	0.937
22	0.037	0.040	0.928	0.040	0.928
23	0.037	0.040	0.926	0.040	0.926
24	0.038	0.040	0.943	0.040	0.943
25	0.040	0.040	0.988	0.040	0.988
26	0.035	0.035	1.006	0.035	1.006
27	0.037	0.035	1.064	0.035	1.064
28	0.033	0.035	0.939	0.035	0.939
29	0.033	0.035	0.950	0.035	0.950
30	0.035	0.035	1.001	0.035	1.001

THREE: APPENDICES

SERVICE-BASED SALARY INCREASE

continued

WSPRS Total Salary Increase					
Service Level	Actual	Old Expected*	Old A/E	New Expected	New A/E
1	0.169	0.123	1.376	0.149	1.137
2	0.121	0.097	1.250	0.113	1.078
3	0.093	0.087	1.069	0.097	0.955
4	0.089	0.087	1.031	0.076	1.171
5	0.088	0.087	1.013	0.061	1.443
6	0.077	0.071	1.078	0.056	1.378
7	0.048	0.041	1.169	0.051	0.953
8	0.039	0.041	0.941	0.045	0.855
9	0.041	0.041	0.992	0.045	0.902
10	0.038	0.041	0.927	0.051	0.756
11	0.042	0.041	1.007	0.045	0.915
12	0.039	0.039	0.993	0.045	0.857
13	0.033	0.039	0.843	0.045	0.728
14	0.034	0.039	0.874	0.045	0.754
15	0.038	0.039	0.974	0.051	0.755
16	0.052	0.039	1.333	0.045	1.150
17	0.043	0.039	1.111	0.045	0.958
18	0.042	0.039	1.074	0.045	0.927
19	0.040	0.039	1.034	0.045	0.893
20	0.041	0.039	1.052	0.045	0.908
21	0.048	0.039	1.232	0.040	1.200
22	0.042	0.039	1.079	0.040	1.051
23	0.037	0.039	0.949	0.040	0.924
24	0.049	0.039	1.249	0.040	1.216
25	0.043	0.039	1.091	0.040	1.062
26	0.044	0.039	1.135	0.035	1.269
27	0.045	0.039	1.162	0.035	1.300
28	0.036	0.035	1.034	0.035	1.034
29	0.048	0.035	1.370	0.035	1.370
30	0.047	0.035	1.343	0.035	1.343

**Based on the rates developed as part of the 2007-2012 Demographic Experience Study.*