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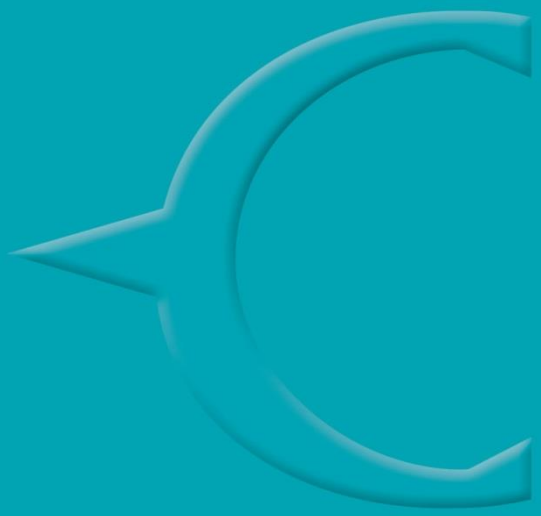

Retirement Plans for Employees of Sacramento Regional Transit District

Actuarial Experience Study for July 1, 2011 through June 30, 2015

Produced by Cheiron

April 2016

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April 15, 2016

Retirement Boards of
Sacramento Regional Transit District
2830 G Street
Sacramento, CA 95816

Dear Members of the Boards:

The purpose of this report is to present an Actuarial Experience Study of the Retirement Plans for Employees of Sacramento Regional Transit District (SacRT Retirement Plans, the Plans) covering actuarial experience from July 1, 2011 through June 30, 2015. The report includes analyses and recommendations of economic and demographic assumptions to be used beginning with the July 1, 2015 actuarial valuation.

If you have any questions about the report or would like additional information, please let us know.

Sincerely,
Cheiron

Robert T. McCrory, ASA, CERA, EA, FCA, MAAA
Principal Consulting Actuary

Graham A. Schmidt, ASA, EA, FCA, MAAA
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Timothy S. Doyle, ASA, MAAA
Associate Actuary

SECTION I - EXECUTIVE SUMMARY

Actuarial assumptions (economic and demographic) are intended to be long-term in nature, and should be both individually reasonable and consistent in the aggregate. The purpose of this experience study is to evaluate whether or not the current assumptions adequately reflect the long-term expectations for SacRT, and if not, to recommend adjustments. It is important to note that frequent and significant changes in the actuarial assumptions are not typically recommended, unless there are known fundamental changes in expectations of the economy, or with respect to SacRT's membership or assets that would warrant such frequent or significant changes.

SUMMARY OF ECONOMIC ASSUMPTION ANALYSIS

The specific economic assumptions analyzed in this report are price inflation, wage inflation, and the discount rate. These assumptions have a significant impact on the contribution rates in the short-term and the risk of negative outcomes in the long-term.

The current economic assumptions adopted by the Retirement Boards at the March, 2016 meeting include a 7.50% long-term nominal rate of return on Plan assets, an annual increase in prices measured by the Consumer Price Index (CPI) of 3.15%, and annual wage increase equal to price increases. This results in a real return assumption of 4.35% (7.50% nominal return minus 3.15% inflation).

The real return is consistent with the capital market assumptions from the Plan's investment consultant (Callan), as well as from a survey of investment consultants. Other data presented in this report indicate that the discount rate and other economic assumptions (including the CPI and wage increase rates of 3.15%) adopted by the Retirement Boards are reasonable.

However, the nominal long-term earnings rate is higher than the long-term (ten-year) capital market assumptions of Callan for the current target portfolio. Their ten-year projections include an average annual return on investments of 6.5%, with 2.25% assumed annual inflation. If the current target asset allocation is maintained and Callan's projections are realized, the Boards can expect a pattern of actuarial losses from the assets in the near term, though they may be partially offset by liability gains if wage increases are below the assumed rate (3.15%) over the same time period.

SUMMARY OF DEMOGRAPHIC ASSUMPTION ANALYSIS

This experience study specifically analyzes and makes the following recommendations for the demographic assumptions.

- **Merit salary increases** – No changes recommended for IBEW. New rates are proposed for ATU and all Salaried plans.
- **Retirement rates** – Lower rates are proposed for longer service ATU/IBEW members and higher rates for shorter service ATU/IBEW members who are eligible for retirement. Lower rates are proposed for Salaried members under age 65.

SECTION I - EXECUTIVE SUMMARY

- **Termination rates** – Higher rates are proposed for ATU members with less than ten years of service and less than 15 years for IBEW members. Reductions in rates are proposed for Salaried members under 25 years of service and new rates for Salaried members exceeding 25 years of service.
- **Disability rates** – Lower rates are proposed for ATU and IBEW members.
- **Mortality rates** – We recommend adjusted Blue Collar RP-2014 mortality tables for ATU and IBEW members and adjusted RP-2014 tables for Salaried members, with generational improvement for all members using MP-2015.

The recommendation to change mortality assumptions has the largest impact on contribution rates. The recommended change to retirement rates partially offsets the increase in contribution rates due to the updated mortality assumption. More details on the impact of each expected assumption change can be found in the materials related to the presentation at the January and March, 2016 meetings of the Boards.

The recently completed mortality study by the Society of Actuaries found that mortality rates had improved faster than previously anticipated and recommended future projections of mortality improvement commensurate with recent experience in the short-term tapering to a long-term expected rate of improvement by 2027. The recommended change to mortality rates for SacRT reflects both the experience of RT for the past nine years, and the application of the generational rates of improvement projected in the future.

The body of this report provides additional detail and support for our conclusions and recommendations.

SECTION II - CERTIFICATION

The purpose of this report is to provide the results of an Actuarial Experience Study of the Retirement Plans for Employees of Sacramento Regional Transit District (SacRT) covering actuarial experience from July 1, 2011 through June 30, 2015. This report is for the use of the SacRT Retirement Boards in selecting assumptions to be used in actuarial valuations beginning July 1, 2015.

In preparing our report, we relied on information (some oral and some written) supplied by SacRT. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

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

This report was prepared for the SacRT Retirement Boards for the purposes described herein. This report is not intended to benefit any other party, and Cheiron assumes no duty or liability to any such party.

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SECTION III - ECONOMIC ASSUMPTIONS
PRICE INFLATION

The economic assumptions used in actuarial valuations are intended to be long-term in nature, and should be both individually reasonable and consistent with each other. The specific assumptions analyzed in this report are:

- **Price inflation** – used indirectly as an underlying component of other economic assumptions.
- **Wage inflation** – across the board wage growth used to project benefits and to amortize the unfunded liability as a level percentage of expected payroll.
- **Discount rate** – used both to project long-term asset growth and to discount future cash flows in calculating the liabilities and costs of the Plan.

In order to develop recommendations for each of these assumptions, we considered historical data, both nationally and for the Plan, and expectations for the future, as expressed by the Plan's investment consultant and the Boards.

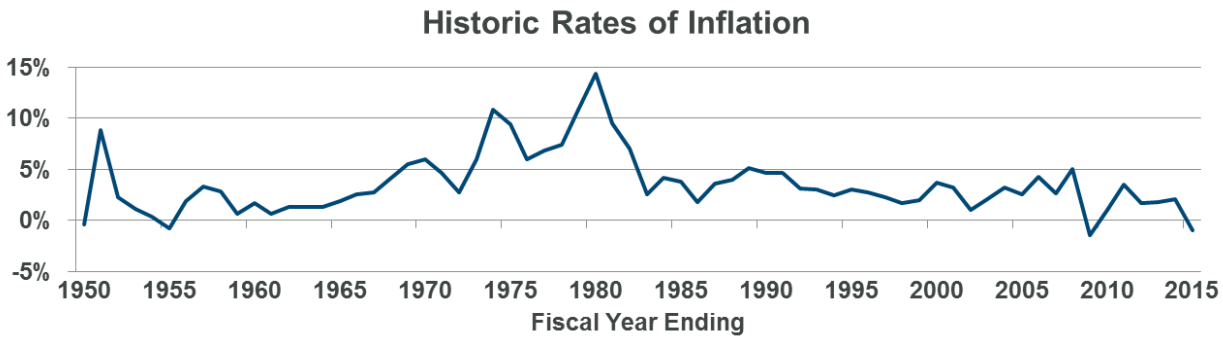
PRICE INFLATION

Long-term price inflation rates are the foundation of other economic assumptions. In a growing economy, wages and investments are expected to grow at the underlying inflation rate plus some additional real growth rate, whether it reflects productivity in terms of wages or risk premiums in terms of investments.

Historical Data

Chart III-1 below shows inflation for the U.S. by individual year since 1950.

Chart III-1



Over the 50 years ending June 2015, the geometric average inflation rate for the U.S. has been about 3.4%, but this average is heavily influenced by the high inflation rates in the 1970s and early 1980s. Over the last 30 years, the geometric average inflation rate has been 2.7%.

SECTION III - ECONOMIC ASSUMPTIONS
PRICE INFLATION

Future Expectations

A measure of the market consensus of expected future inflation rates is the difference in yields between conventional treasury bonds and Treasury Inflation-Protected Securities (TIPS) at the same maturity. Table III-1 shows the yields on both types of bonds and the break-even inflation rate as of December 2015. Break-even inflation is the level of inflation needed for an investment in TIPS to "break even" with an investment in conventional treasury bonds of the same maturity.

Table III-1

Break-Even Inflation Based on Treasury Bond Yields

Time to Maturity	Conventional Yield	TIPS Yield	Break Even Inflation
5 Years	1.70%	0.46%	1.24%
10 Years	2.24%	0.73%	1.51%
20 Years	2.61%	1.06%	1.55%

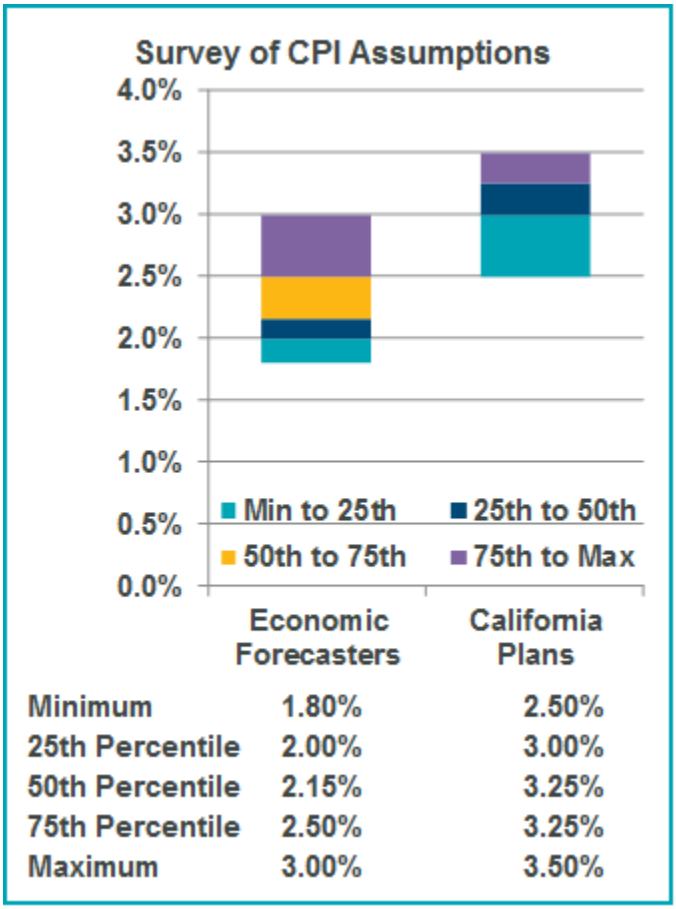
Data Source Federal Reserve, Constant Maturity Yields, Monthly Series

The Federal Reserve Bank of Philadelphia publishes a quarterly survey of professional economic forecasters that includes their forecasts of inflation over the next 10 years. The survey for the second quarter of 2015 shows a median inflation forecast of 2.15%; a minimum forecast of about 1.8% and a maximum forecast of 3.0%.

Chart III-2 on the next page shows the distribution of the current 10-year forecasts for CPI-U from the professional survey published by the Federal Reserve Bank of Philadelphia compared to the assumptions used by California public pension plans. The most common assumption in California public pension plans is 3.25% (used by 18 of the 35 systems in the survey). We note that all of the inflation assumptions used by California public pension plans are in the top quartile of the ten-year forecast published by the Federal Reserve.

SECTION III - ECONOMIC ASSUMPTIONS
PRICE INFLATION

Chart III-2



Finally, Callan, the Boards' investment consultant, uses an inflation assumption of 2.25% for the next ten years.

Based on all of these considerations, we believe a reasonable range for long-term price inflation for use in the Plan's actuarial valuations is between 2.25% and 3.5%. Therefore, we agree with the Boards' recent action at the time of the 2014 actuarial valuation to reduce the assumption from 3.25% to 3.15%. If, at the time of the next review of economic assumptions, the markets and forecasters continue to indicate lower expectations of future inflation, further reductions in the assumption should be considered.

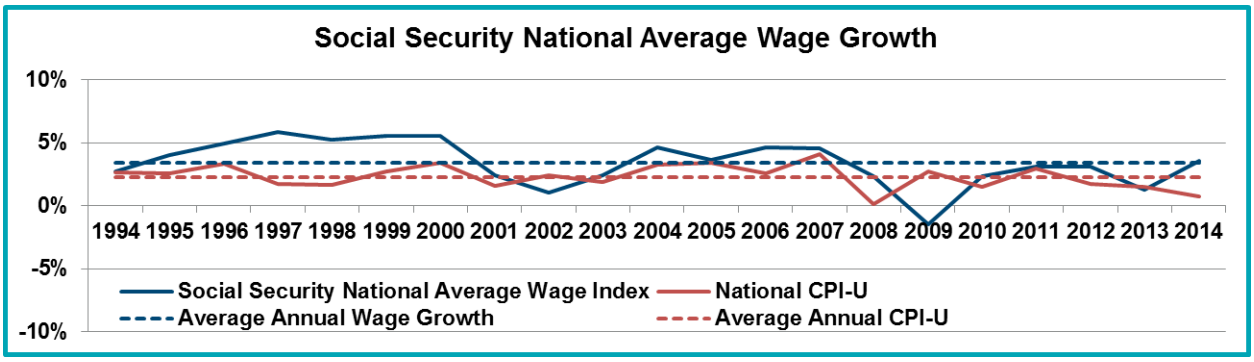
WAGE INFLATION

Wage inflation can be thought of as the annual across-the-board increase in wages. Individuals often receive salary increases in excess of the wage inflation rate, and we study these increases as a part of the merit salary scale assumption. Wage inflation generally exceeds price inflation by some margin reflecting the history of increased purchasing power.

Wage inflation is used in the actuarial valuation as the minimum expected salary increase for an individual and, for purposes of amortizing the unfunded actuarial liability, the rate at which payroll is expected to grow over the long term, assuming a stable active member population.

Chart III-3 shows the increase in national average wages (as reported by the Social Security Administration) compared to inflation from 1994 through 2014.

Chart III-3



Over this period, national wage inflation averaged approximately 3.4% compared to annual price inflation of 2.3%. Note the significant drop in 2008 and 2009 as well as the recent decline in national average wage growth in 2013.

Usually we recommend that long range gains due to productivity, the collective bargaining process or other pressures should be assumed to be zero or minimal. While productivity tends to increase in many sectors of the economy, any long-term assumption of salary growth beyond inflation carries with it an assumed improvement in relative standard of living. For transit employees in particular, such pay increases beyond the rate of inflation have not been observed. For example, over the last four years, pay increases for salaried members averaged about 1.5% per year, while for hourly employees the annual increase was less than 1%. Therefore, the current assumption of no increases in wages over inflation continues to be reasonable.

DISCOUNT RATE

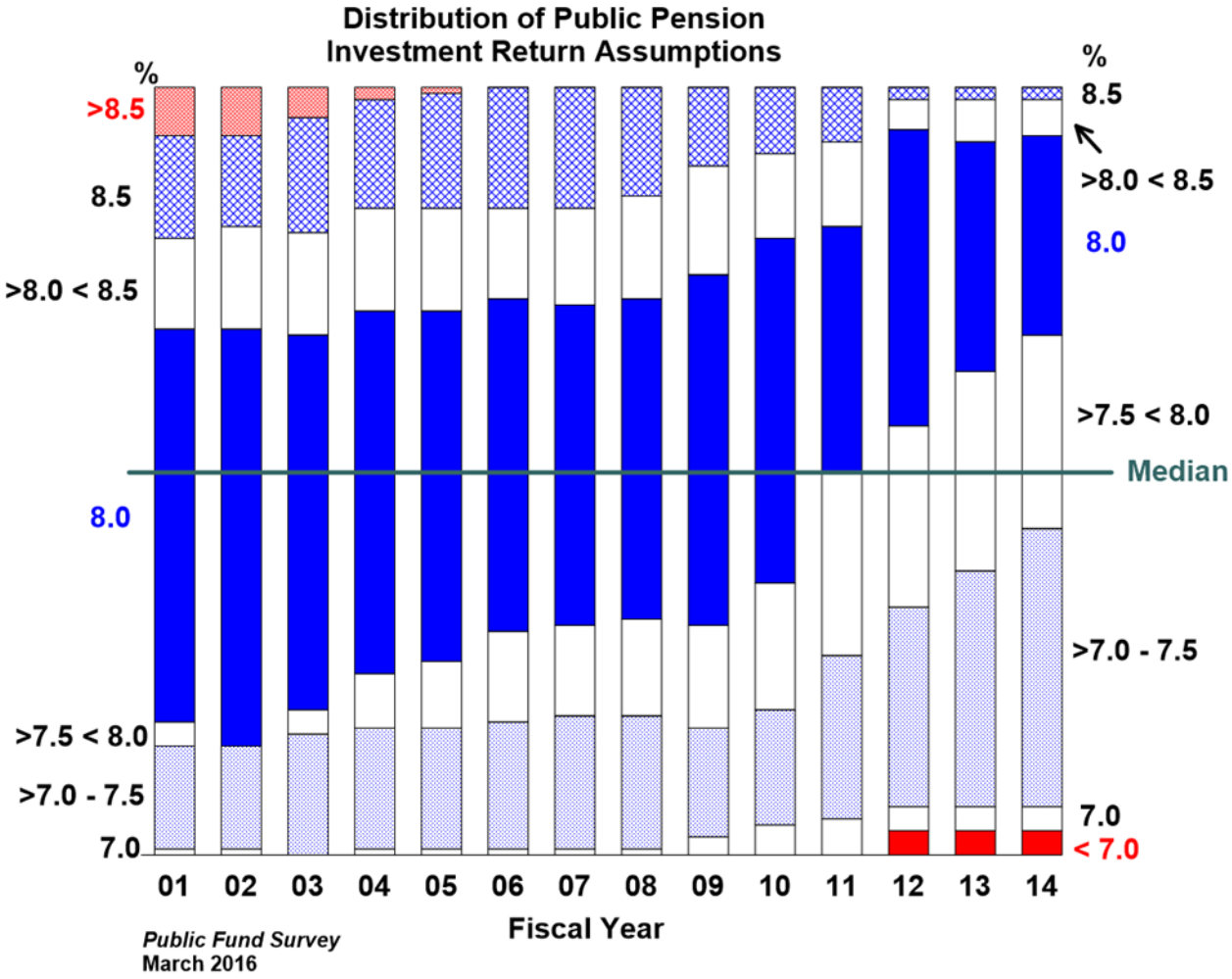
The discount rate assumption is generally the most significant of all the assumptions employed in actuarial valuations. The discount rate is based on the long-term expected return on plan investments. In the short-term, a higher discount rate results in lower expected contributions. However, over the long term, actual contributions will depend on actual investment returns and not the discount rate (or expected investment returns). If actual investment returns are lower than expected, contribution rates will increase in the future. It is important to set a realistic discount rate so that projections of future contributions for budgeting purposes will not be biased, particularly to be too low.

Other Large Public Retirement Plans

Based on the Public Fund Survey, developed by the National Association of State Retirement Administrators (NASRA) covering most of the largest public retirement systems in the country, there has been a general movement over at least the last decade to reduce the discount rate used in actuarial valuations. Chart III-4 on the next page shows the change in the distribution of assumptions since 2001. The median assumption is now 7.75% and the number of plans using a discount rate of 7.5% or lower has increased significantly.

SECTION III - ECONOMIC ASSUMPTIONS
DISCOUNT RATE

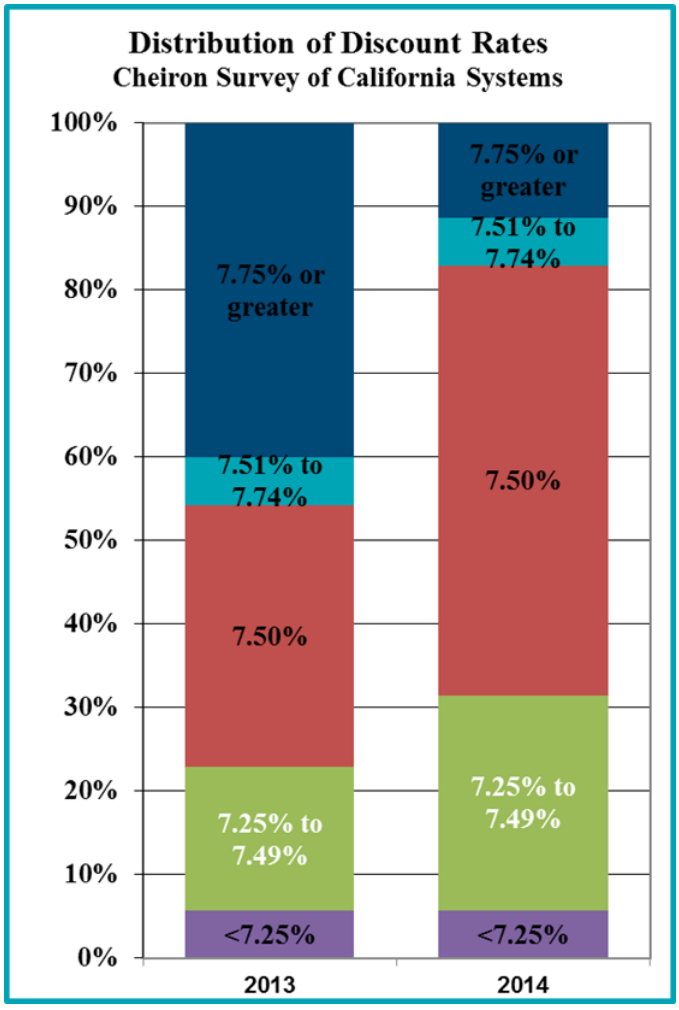
Chart III-4



In our survey of California retirement systems, the median assumption is even lower at 7.50 percent with 18 of the 35 systems using the median rate. Only 4 systems use a rate as high as 7.75 percent. Chart III-5 on the following page shows the change in discount rate assumptions for California systems from 2013 to 2014.

SECTION III - ECONOMIC ASSUMPTIONS
DISCOUNT RATE

Chart III-5



Target Asset Allocation and Future Expectations

Tables III-2 and III-3 on the next page show the target allocation based on the Boards' current policy along with the capital market assumptions provided by the Plan's investment consultant (Callan), and those from a survey of ten investment consultants published by Horizon Actuarial Services. The Callan assumptions are intended to project returns over a ten-year period, while the Horizon survey results cover a 20-year time horizon.

Based on these assumptions, we calculated an expected geometric return of 7.27% percent under the Horizon survey assumptions, but only a 6.36% return under the Callan assumptions.

SECTION III - ECONOMIC ASSUMPTIONS
DISCOUNT RATE

Table III-2

Callan (10-year) Assumptions				
Asset Category	Target Allocation	Arithmetic Return	Geometric Return	Standard Deviation
US Large Cap Equity	32.0%	8.6%	7.1%	18.0%
US Small Cap Equity	8.0%	9.9%	7.6%	22.8%
Non-US Developed Equity	19.0%	9.6%	7.5%	21.3%
Emerging Markets Equity	6.0%	11.2%	7.8%	27.9%
Domestic Fixed Income	35.0%	3.1%	3.0%	3.8%
Total	**100.0%**	**7.09%**	**6.36%**	**12.56%**

.

Table III-3

Horizon Survey (20-year) Assumptions				
Asset Category	Target Allocation	Arithmetic Return	Geometric Return	Standard Deviation
US Large Cap Equity	32.0%	9.2%	7.9%	17.1%
US Small Cap Equity	8.0%	10.2%	8.2%	21.0%
Non-US Developed Equity	19.0%	9.8%	8.1%	19.6%
Emerging Markets Equity	6.0%	12.3%	9.2%	26.6%
Domestic Fixed Income	35.0%	4.6%	4.4%	5.6%
Total	**100.0%**	**7.91%**	**7.27%**	**12.14%**

Based on these capital market assumptions, we also calculated the potential distribution of returns over 10 and 20-year periods as shown in Table III-4. The 50th percentile return under the Horizon survey assumptions was 7.27%, which is lower, but reasonably close to the 7.50% nominal return recently adopted by the Boards. Using the survey's average inflation assumption of 2.29% results in a 4.98% real return assumption, which is well above the Boards' recently adopted real return of 4.35%.

SECTION III - ECONOMIC ASSUMPTIONS
DISCOUNT RATE

Table III-4

Expected Distribution of Average Annual Passive Investment Returns				
	Callan (10 years)		Horizon Survey (20 years)	
Percentile	Nominal	Real	Nominal	Real
95th	13.03%	10.78%	11.79%	9.50%
75th	9.05%	6.80%	9.10%	6.81%
50th	6.36%	4.11%	7.27%	4.98%
25th	3.74%	1.49%	5.48%	3.19%
5th	0.09%	-2.16%	2.94%	0.65%

As stated earlier in this report, the Callan geometric assumption for the current target portfolio is considerably lower over the next ten years (6.36%). However, the median real return under the Callan assumptions (4.11%) is relatively close to that recently adopted by the Boards: 4.35%, based on a 7.50% nominal return and 3.15% price inflation.

As of the 2013 valuation, the expected rate of return is expressed net of investment, but not administrative, expenses. The returns above were modeled based on the expected returns of the portfolio benchmark indices, which are expected to have minimal expenses. The actuarial standards on selecting a return assumption (ASOP 27) state that in general superior or inferior returns (net of fees) should not be assumed for active versus passive management, therefore we do not recommend a significant adjustment to the modeled returns for the fees of the asset managers. However, a slight margin is appropriate to reflect the investment-related expenses other than those of the investment managers, which would include the investment advisor and custodian.

The recently adopted discount rate of 7.50% is consistent with the Horizon survey of long-term capital market assumptions, including adjustments for the difference in the survey (2.29%) versus the Boards' (3.15%) inflation assumptions, and including a small adjustment for investment-related expenses as described above. We therefore find the current discount rate to be a reasonable assumption. However, there are a number of factors that suggest that the near-term expected rate of return should be discussed.

- Many investment consultants expect poor rates of return in the immediate and near-term future. They reason that there is little in the way of yields on fixed income, and that the equity markets are fully valued.

- If Callan and much of the investment community are correct in their projections, we can expect returns below the 7.50% assumed rate for a number of years. This will result in actuarial losses and increases in employer contribution rates. However, these losses may be partially offset by gains on the liabilities from wage inflation below the assumed level (3.15%).

SECTION III - ECONOMIC ASSUMPTIONS
DISCOUNT RATE

- We believe that near- and mid-term return projections should be considered along with long-term projections. Fund performance is usually measured over five to ten years; longer measurement periods are often considered less relevant because of the potential for changes in the economy and in the investment markets.

As a result, the prospect of several years of actuarial losses, in line with the Callan assumptions, and the resulting increases in the District contribution rates should be communicated to their staff for use in planning. In addition, we recommend that the Boards and staff continue to conduct at least a brief discussion of this assumption annually, in consultation with the Plan's actuary and investment consultant, to determine if further changes are appropriate.

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES

Demographic assumptions are used to predict membership behavior, including rates of retirement, termination, disability, and mortality. These assumptions are based primarily on the historical experience of SacRT, with some adjustments where future experience is expected to differ from historical experience and with deference to standard tables where SacRT experience is not fully credible and a standard table is available. For purposes of this study, merit salary increases and administrative expenses are also considered demographic assumptions because the assumptions are based primarily on SacRT's historical experience.

MERIT SALARY INCREASES

Salary increases consist of three components: Increases due to cost-of-living maintenance (inflation), increases related to non-inflationary pressures on base pay (such as productivity increases), and increases in individual pay due to merit, promotion, and longevity. Increases due to cost-of-living and non-inflationary base pay factors were addressed in an earlier section of this report.

The charts on the next three pages compare the current pay patterns for members with current pay data. Only increases due to merit (promotion and longevity) are considered here. In the graphs, the average pay of the active members of SacRT as of July 1, 2015 is plotted against service. A curve is then fitted to the average pay data, and this curve is used to determine a pay increase due to merit. The current assumed pay increases due to merit are shown by the red lines, the yellow circles represent the average pay at each year of service, and the recommended assumptions (if applicable) are shown by the green lines.

This is a *transverse* study of longevity and promotion pay increases: salaries are examined at one point in time (the valuation date), as opposed to being observed over a number of years (a *longitudinal* study). This type of study serves as a reliable way to assess average increases in pay due to merit. The analysis begins with a plot of average pay versus service for the current active members of a plan. With a homogeneous group of any size at all, the pattern of promotions and longevity increases during the career of an average employee can be visible in this analysis.

Longitudinal studies, which use changes in pay collected over several years, are often unreliable when used on a stand-alone basis due to the effects of inflation and collective bargaining during the term of the study.

For ATU members, the current assumption of 9% increases for the first six years of service and 0.5% thereafter is different than observed increases in merit pay during the first nine years or so of service. Therefore adjustments in the assumption are recommended at this time, reflecting an assumption of 6% increases for the first ten years of service.

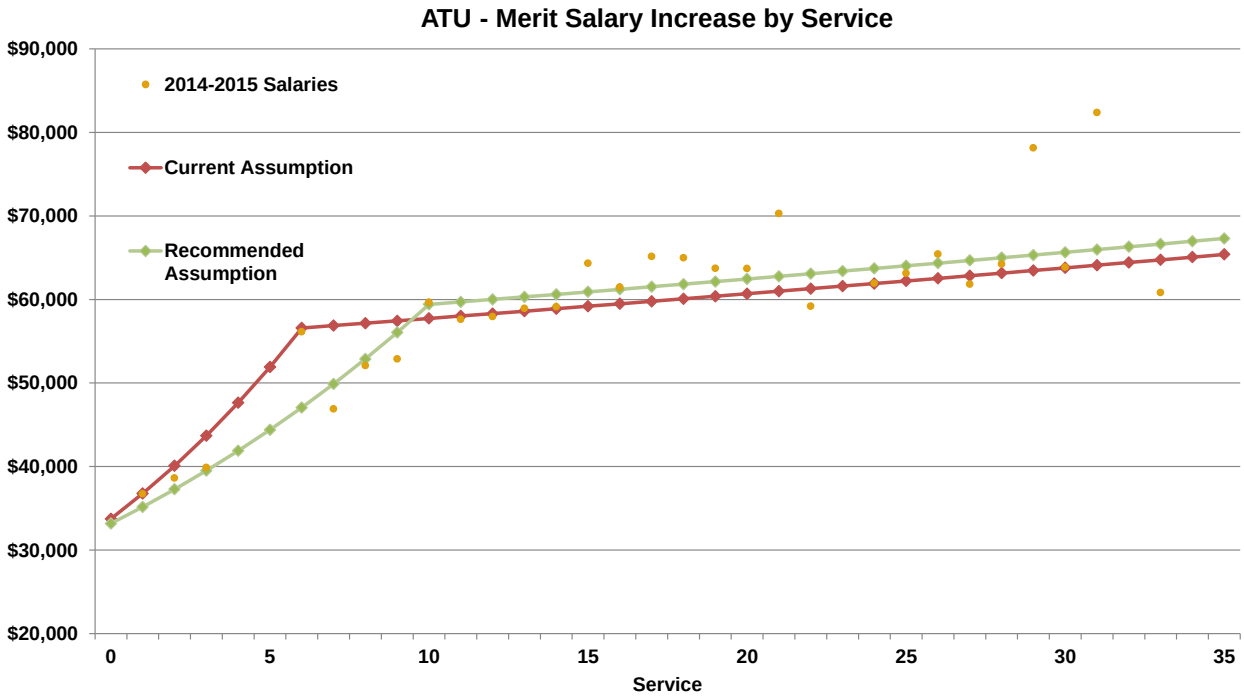
For IBEW members the current assumption of 5% increases for the first six years of service and 0.25% thereafter is close to the observed increases in pay, and no change in the assumption is recommended at this time.

For AFSCME members the current assumption reflects 5.0% increases for the first five years of service, 1.25% increases for the next 15 years of service, and no increases thereafter. Updating the assumption to include 2.0% increases for the first 20 years of service is recommended at this time.

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES

For AEA and MCEG members the current assumption includes 12.0% increases for the first three years of service and 0.5% increases thereafter. Updating the assumption to 3.25% increases for the first ten years of service and 0.5% increases afterward is recommended at this time.

Chart IV-1



SECTION IV - DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES

Chart IV-2

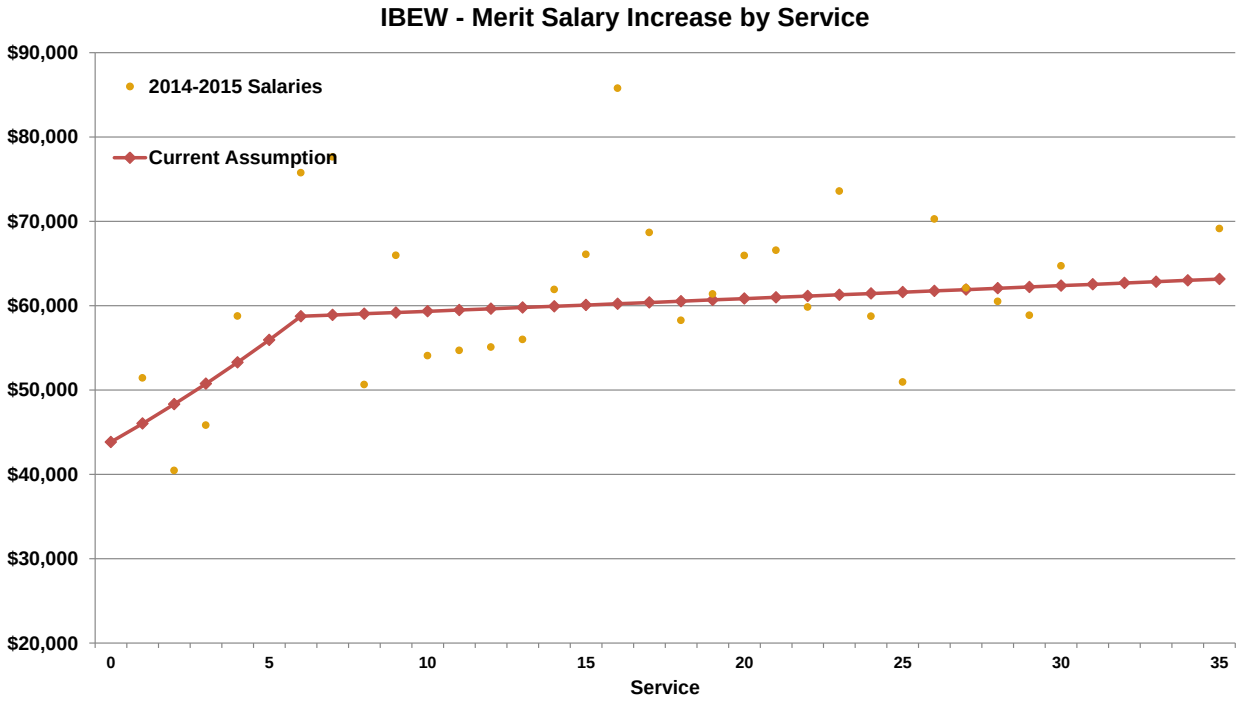
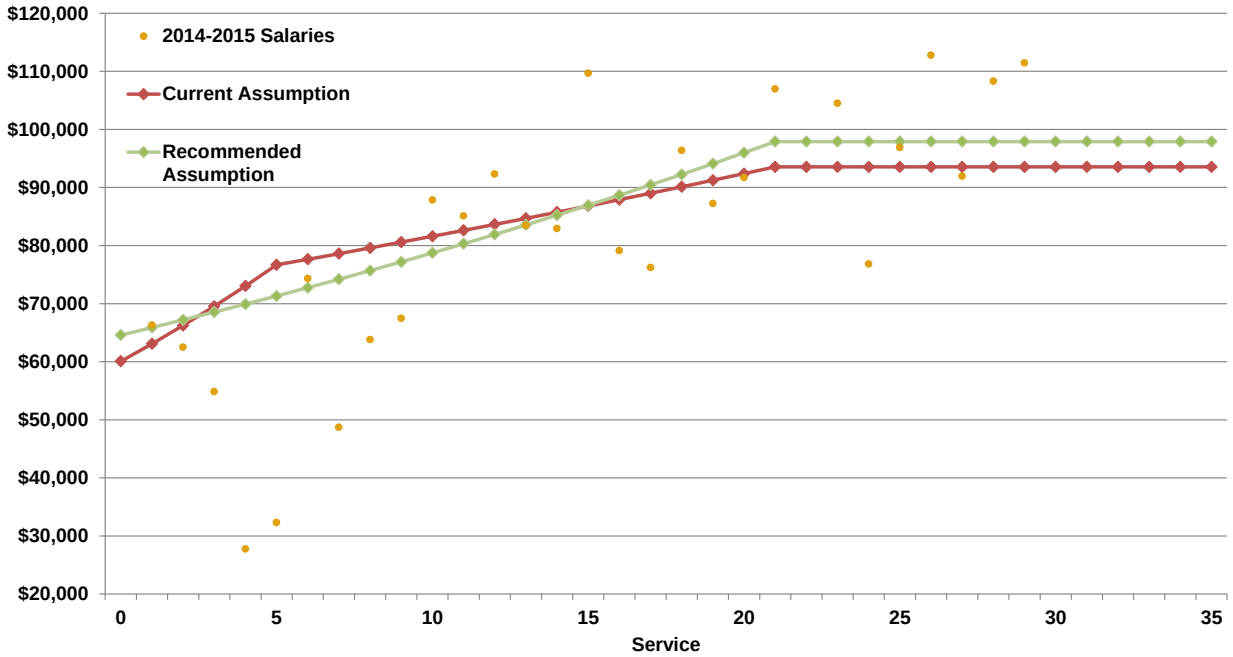
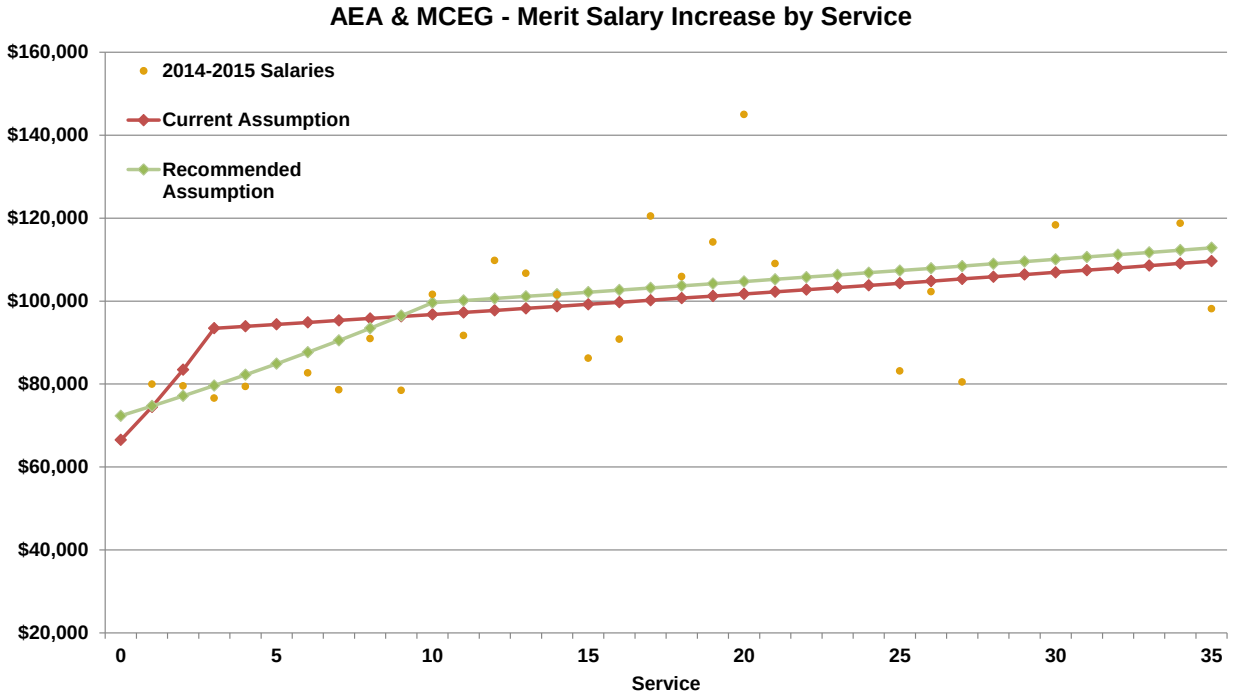


Chart IV-3



SECTION IV - DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES

Chart IV-4



ANALYSIS OF OTHER DEMOGRAPHIC ASSUMPTIONS

For all of the remaining demographic assumptions, we determined the ratio of the actual number of decrements for each membership group compared to the expected number of decrements (A/E ratio or actual-to-expected ratio). If the assumption is perfect, this ratio will be 100 percent. Otherwise, any recommended assumption change should move from the current A/E ratio towards 100 percent unless future experience is expected to be different than the experience during the period of study.

We also calculate an r-squared statistic for each assumption. R-squared measures how well the assumption fits the actual data and can be thought of as the percentage of the variation in actual data explained by the assumption. Ideally, r-squared would equal 100 percent although this is never the case. Any recommended assumption change should increase the r-squared compared to the current assumption making it closer to 100 percent unless the pattern of future decrements is expected to be different from the pattern experienced during the period of study.

For disability and mortality rates, we compare SacRT's experience to that of a standard table, and adjust the standard table standard table to bring the proposed assumption closer to an A/E ratio of 100.

RETIREMENT RATES

The current retirement rates vary by age and service and are applied to all members who are eligible to retire. In reviewing the data for SacRT, we found that at any given age, members with more service are generally more likely to retire than members with fewer years of service. SacRT isn't large enough to justify assumptions for each age and service combination, so we recommend separate assumptions by age for each of the following four service groups for ATU/IBEW and Salaried members:

- Members with 5 to 9 years of service (excludes ATU),
- Members with 10 to 24 years of service,
- Members with 25 to 29 years of service,
- Members with 30 or more years of service.

Table IV-R1 shows the calculation of actual-to-expected ratios and the r-squared statistic for ATU members across all service levels. Chart IV-R1 show the comparison of the actual retirement rates by age to the current and proposed assumptions.

The data showed lower actual retirement rates than expected under the current assumptions at lower levels of service, and higher rates at some ages and service levels (ages 62-64 with 10-24 years of service, and ages 50-54 with 25-29 years of service). Refer to Appendix A for proposed rates and Appendix B for the prior rates by age at the various service groups.

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

The proposed assumptions decrease the aggregate assumed rate of retirement and increase the aggregate A/E ratio from 81 percent to 96 percent. The r-squared also increases slightly, from 0.65 to 0.68.

Table IV-R1
ATU

Retirement Rates - All Years of Service						
		Retirements			Actual to Expected Ratios	
Age	Exposures	Actual	Current	Recommended	Current	Recommended
50	4	1	0	0	521%	260%
51	4	0	0	0	0%	0%
52	5	1	0	0	347%	208%
53	5	0	0	0	0%	0%
54	2	2	0	0	1389%	1042%
55	44	4	3	3	122%	125%
56	47	2	4	3	57%	78%
57	40	3	3	2	93%	132%
58	39	1	3	2	31%	43%
59	41	3	3	2	89%	122%
60	35	2	3	2	65%	94%
61	43	4	4	3	111%	156%
62	34	6	6	7	99%	88%
63	29	5	6	6	88%	85%
64	19	2	4	4	52%	52%
65	15	5	8	5	67%	111%
66	14	2	4	4	45%	57%
67	12	5	4	3	130%	167%
68	8	2	3	2	78%	100%
69	4	0	1	1	0%	0%
70	2	0	2	2	0%	0%
Total	**446**	**50**	**62**	**52**	**81%**	**96%**
R-squared			**0.6548**	**0.6778**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Chart IV-R1
ATU

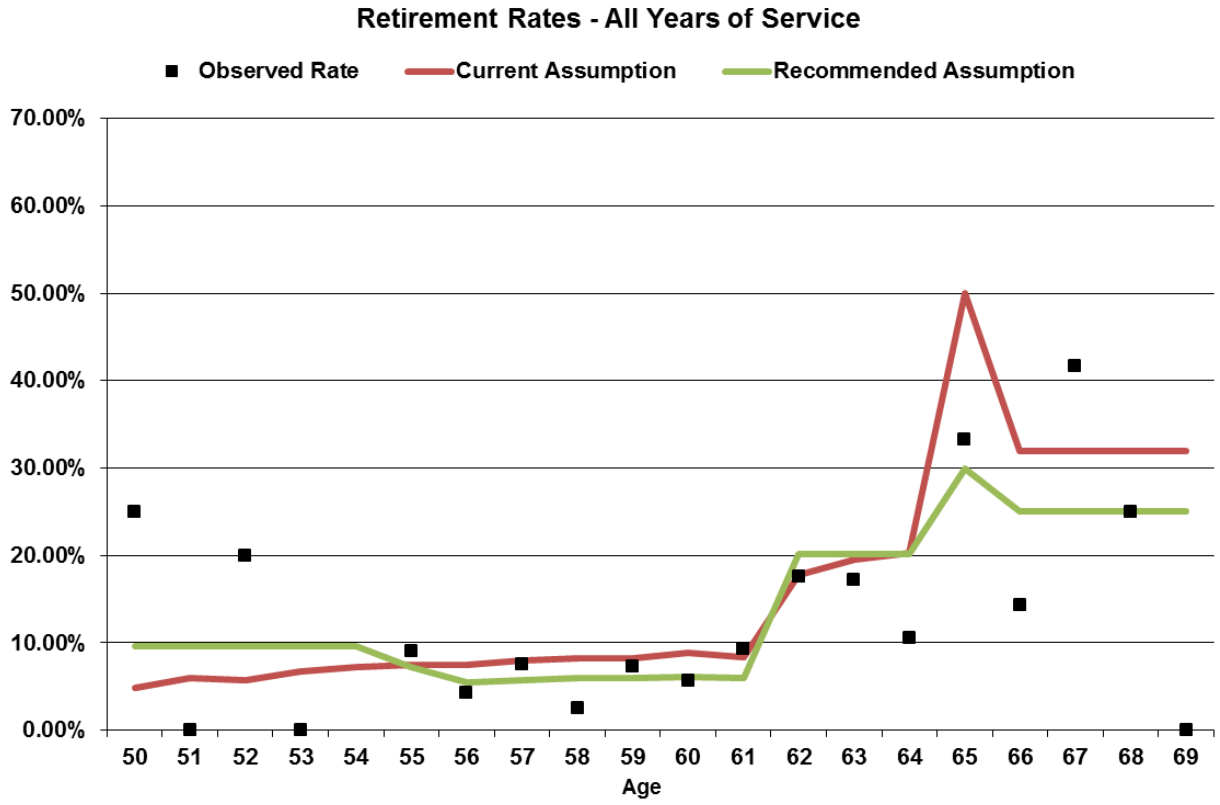


Table IV-R2 shows the calculation of actual-to-expected ratios and the r-squared statistic for IBEW members. Chart IV-R2 shows the information graphically.

The data showed lower actual retirement rates than expected under the current assumptions at most age and service levels, though higher rates at some age and service levels (age 61 with 10-24 years of service, 25-29 years of service at ages other than 60-61). Previously, IBEW had separate retirement rates for members with 30 years of service and 31 or more years of service. Based on experience for July 1, 2011 through June 30, 2015, recommended retirement rates are inclusive with 30 or more years of service.

The proposed assumptions decrease the aggregate assumed rate of retirement and increase the aggregate A/E ratio from 63 percent to 98 percent. The r-squared also increases from 0.52 to 0.61. Refer to Appendix A for proposed rates and Appendix B for the prior rates by age at the various service groups.

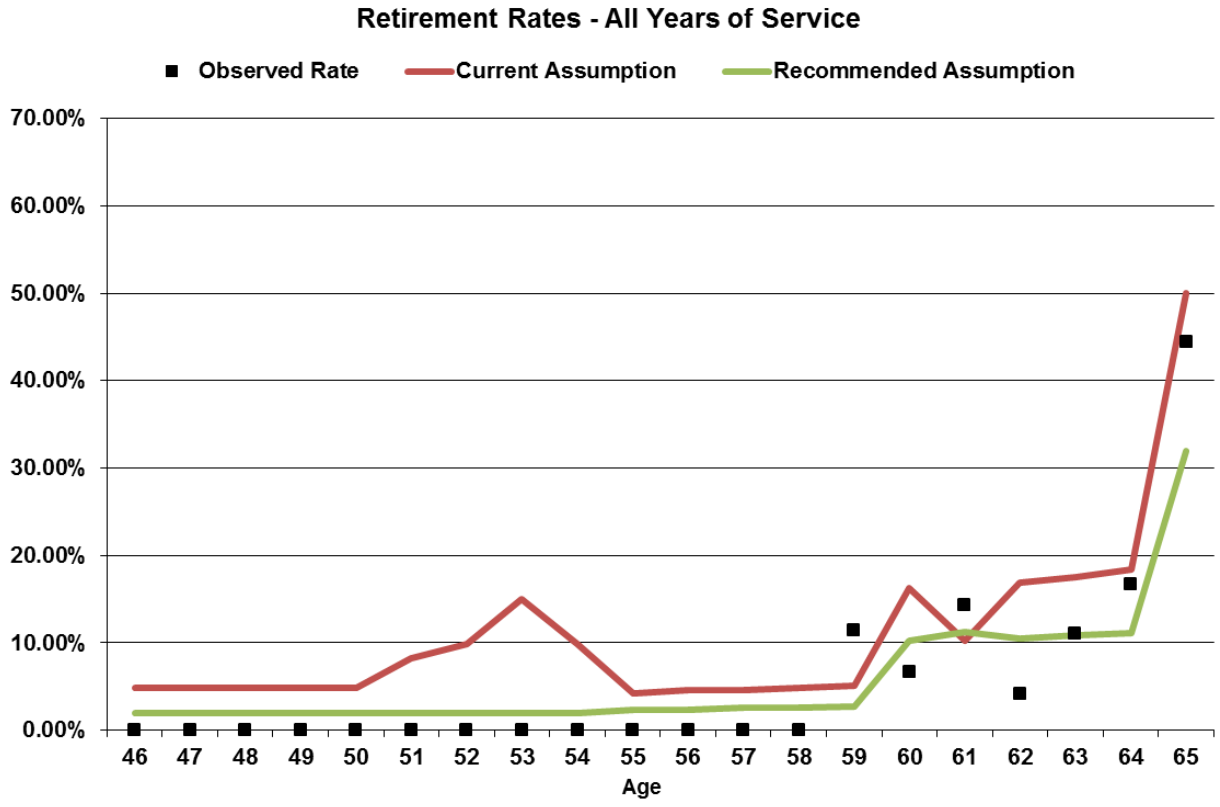
SECTION IV - DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table IV-R2
IBEW

Retirement Rates - All Years of Service						
		Retirements			Actual to Expected Ratios	
Age	Exposures	Actual	Current	Recommended	Current	Recommended
46	1	0	0	0	0%	0%
47	1	0	0	0	0%	0%
48	2	0	0	0	0%	0%
49	2	0	0	0	0%	0%
50	1	0	0	0	0%	0%
51	3	0	0	0	0%	0%
52	2	0	0	0	0%	0%
53	1	0	0	0	0%	0%
54	2	0	0	0	0%	0%
55	25	0	1	1	0%	0%
56	20	0	1	0	0%	0%
57	26	0	1	1	0%	0%
58	31	0	2	1	0%	0%
59	35	4	2	1	224%	417%
60	30	2	5	3	41%	65%
61	28	4	3	3	139%	127%
62	24	1	4	3	25%	40%
63	18	2	3	2	63%	102%
64	12	2	2	1	91%	150%
65	9	4	5	3	89%	139%
66	3	0	1	1	0%	0%
Total	**276**	**19**	**30**	**19**	**63%**	**98%**
R-squared			**0.5188**	**0.6112**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Chart IV-R2
IBEW



SECTION IV - DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table IV-R3 shows the calculation of actual-to-expected ratios and the r-squared statistic for the Salaried groups and Chart IV-R3 shows the information graphically.

The data shows lower actual retirement rates than expected under the current assumption, particularly for longer service members. Previously, the Salaried groups (AFSCME/AEA/MCEG) had separate retirement rates for members with twenty to twenty-four years of service. Based on experience for July 1, 2011 through June 30, 2015, the recommended retirement rates for members with twenty to twenty-four years of service are the same as the proposed retirement rates for members with ten to nineteen years of service, which sets the new service bracket to ten to twenty-four years of service.

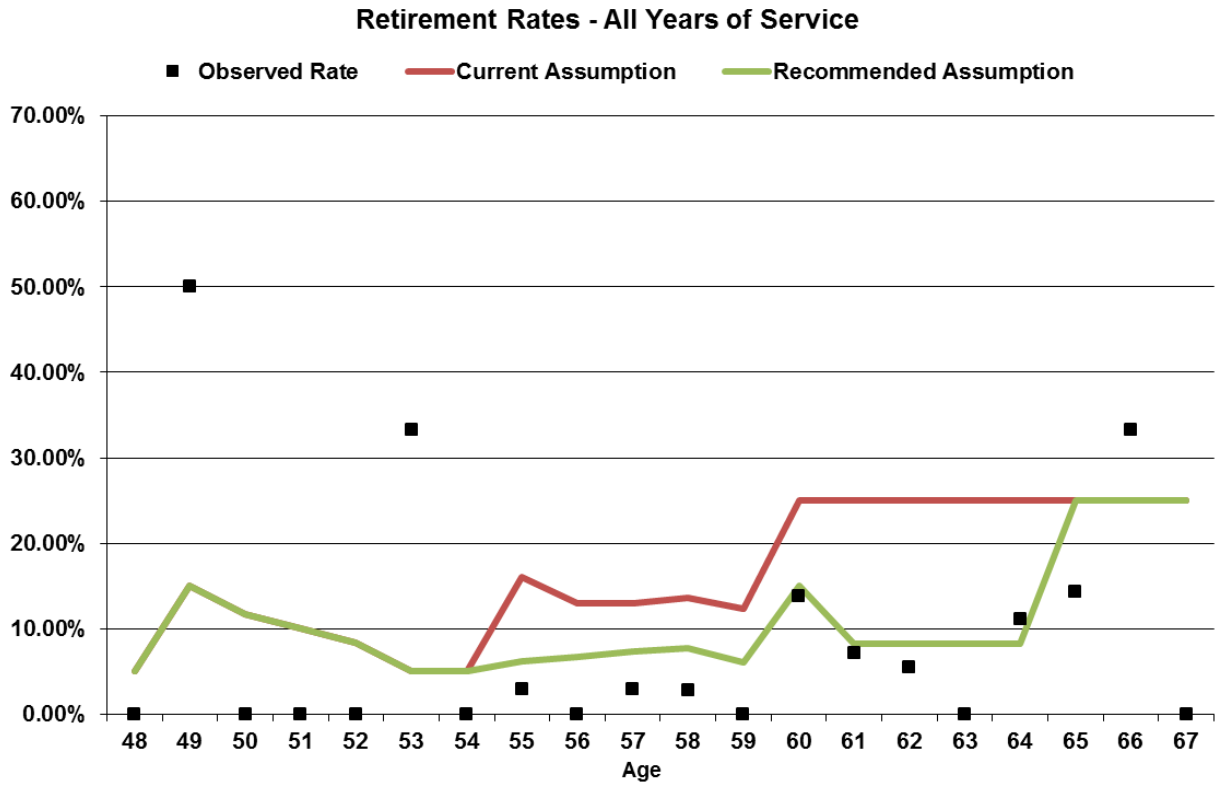
The proposed assumptions decrease the aggregate assumed rate of retirement and increase the aggregate A/E ratio from 31 percent to 60 percent. The r-squared also increases from 0.33 to 0.45. Refer to Appendix A for proposed rates and Appendix B for the prior rates by age at the various service groups.

Table IV-R3
Salaried

Retirement Rates - All Years of Service						
		Retirements			Actual to Expected Ratios	
Age	Exposures	Actual	Current	Recommended	Current	Recommended
48	1	0	0	0	0%	0%
49	2	1	0	0	333%	333%
50	3	0	0	0	0%	0%
51	4	0	0	0	0%	0%
52	6	0	1	1	0%	0%
53	3	1	0	0	667%	667%
54	4	0	0	0	0%	0%
55	34	1	5	2	18%	48%
56	35	0	5	2	0%	0%
57	34	1	4	3	23%	40%
58	36	1	5	3	20%	36%
59	37	0	5	2	0%	0%
60	29	4	7	4	55%	92%
61	28	2	7	2	29%	87%
62	18	1	5	1	22%	67%
63	13	0	3	1	0%	0%
64	9	1	2	1	44%	135%
65	7	1	2	2	57%	57%
66	6	2	2	2	133%	133%
67	2	0	1	1	0%	0%
68	2	1	1	1	200%	200%
Total	**313**	**17**	**54**	**28**	**31%**	**60%**
R-squared			**0.3263**	**0.4470**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Chart IV-R3
Salaried



For all groups, the proposed assumptions reflect significant reductions to the overall expected rates of retirement, indicating an assumption that members are working longer than previously expected. We will monitor member behavior as part of the annual actuarial valuations, to determine whether the change in retirement patterns witnessed in this experience study is expected to continue.

SECTION IV - DEMOGRAPHIC ASSUMPTIONS

TERMINATION RATES

Termination rates reflect the frequency at which active members leave employment for reasons other than retirement, death or disability. Currently, ATU and IBEW have separate sets of service-based termination rates. Salaried members have an age/service based set of termination rates.

For each service or age/service group, we determined the ratio of the actual number of terminations at each age compared to the expected number of terminations (A/E ratio). If the assumption is perfect, this ratio will be 100 percent. Adjustments are made to account for differences between future expectations and historical experience, to account for the past experience represented by the current assumption, and to maintain a neutral to slight conservative bias in the selection of the assumption.

Table IV-T1 shows the calculation of actual-to-expected ratios and the r-squared statistic for ATU members, and Chart IV-T1 shows the information graphically.

The data shows higher actual termination rates than expected under the current assumption. The proposed assumption increases the assumed rates of termination and decreases the aggregate A/E ratio from 107 percent to 101 percent. The r-squared also decreases slightly from 0.71 to 0.70.

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Table IV-T1

ATU Termination Rates						
		Retirements			Actual to Expected Ratios	
Service	Exposures	Actual	Current	Recommended	Current	Recommended
0	78	8	7	7	114%	114%
1	89	1	4	4	22%	22%
2	42	2	2	2	95%	95%
3	20	2	1	1	200%	200%
4	30	2	1	1	222%	222%
5	53	-	2	2	0%	0%
6	106	1	3	3	31%	31%
7	134	8	4	4	199%	199%
8	182	3	5	5	55%	55%
9	225	11	7	7	163%	163%
10	118	3	2	3	127%	102%
11	97	1	2	2	52%	41%
12	79	4	2	2	253%	203%
13	52	1	1	1	96%	77%
14	53	-	1	1	0%	0%
15	41	-	1	1	0%	0%
16	29	1	1	1	172%	138%
17	20	1	0	1	250%	200%
18	11	1	0	0	455%	364%
19	6	-	0	0	0%	0%
20	7	-	0	0	0%	0%
21	7	-	0	0	0%	0%
22	12	-	0	0	0%	0%
23	9	-	0	0	0%	0%
24	4	-	0	0	0%	0%
25+	-	-	-	-	0%	0%
Total	**1,504**	**50**	**47**	**49**	**107%**	**101%**
R-squared			**0.7061**	**0.7048**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Chart IV-T1

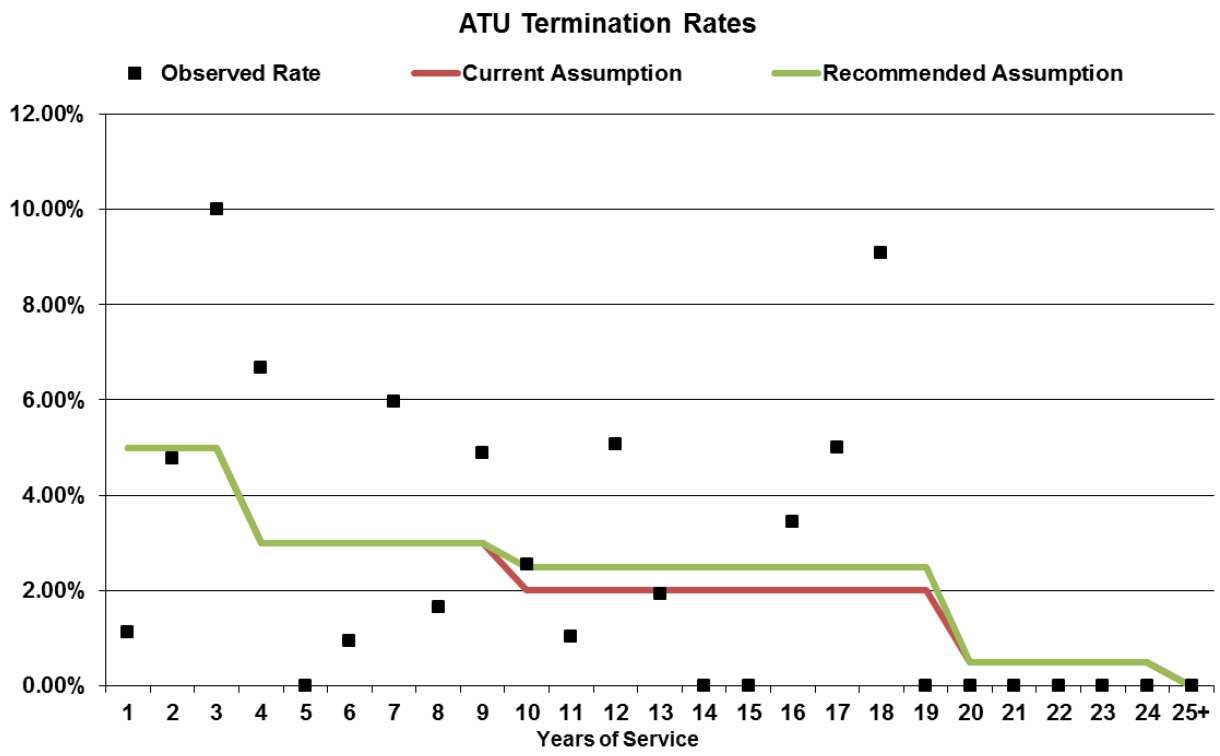


Table IV-T2 shows the calculation of actual-to-expected ratios and the r-squared statistic for IBEW members, and Chart IV-T2 shows the information graphically.

The data shows higher actual termination rates than expected under the current assumption, particularly with members with less than 15 years of service. The proposed assumption increases the assumed rates of termination and decreases the aggregate A/E ratio from 193 percent to 102 percent. The r-squared also increases from 0.36 to 0.48.

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Table IV-T2

IBEW Termination Rates						
		Retirements			Actual to Expected Ratios	
Age	Exposures	Actual	Current	Recommended	Current	Recommended
0	36	2	3	3	62%	69%
1	35	4	2	3	229%	143%
2	37	2	2	3	108%	68%
3	15	1	1	1	190%	83%
4	31	3	1	2	276%	121%
5	19	3	0	1	789%	316%
6	40	1	1	2	125%	50%
7	22	4	0	1	909%	364%
8	50	-	1	3	0%	0%
9	24	-	0	1	0%	0%
10	38	1	0	1	526%	96%
11	24	2	0	1	1667%	303%
12	17	-	0	0	0%	0%
13	14	-	0	0	0%	0%
14	16	-	0	0	0%	0%
15	6	-	0	0	0%	0%
16	7	-	0	0	0%	0%
17	1	-	0	0	0%	0%
18	10	-	0	0	0%	0%
19	4	-	0	0	0%	0%
20	11	-	0	0	0%	0%
21	7	-	0	0	0%	0%
22	10	-	0	0	0%	0%
23	7	-	0	0	0%	0%
24	7	1	0	0	2857%	2857%
25+	-	-	-	-	0%	0%
Total	**488**	**24**	**12**	**23**	**193%**	**102%**
R-squared			**0.3614**	**0.4772**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Chart IV-T2

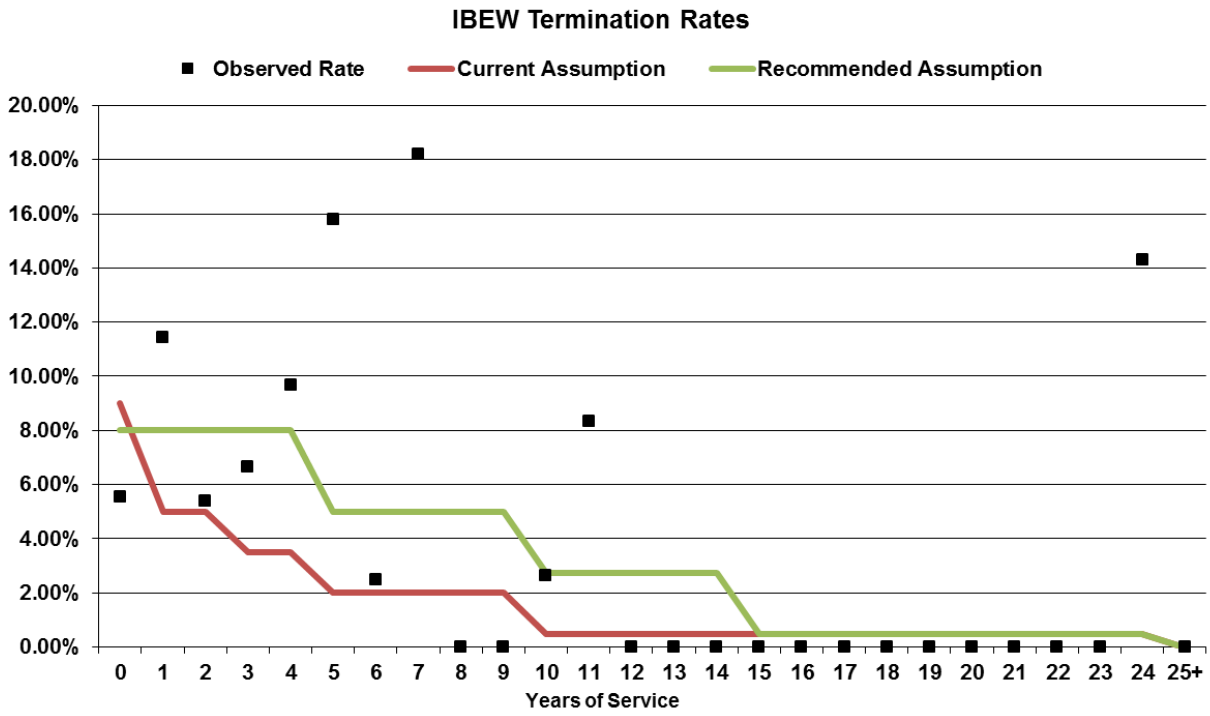


Table IV-T3 shows the calculation of actual-to-expected ratios and the r-squared statistic for Salaried members with less than five years of service.

The data shows lower actual termination rates than expected under the current assumption, which is 10% per year at all ages. The proposed assumption decreases the assumed rates of termination to 5% per year, and increases the aggregate A/E ratio from 43 percent to 87 percent. The r-squared is level at 0.21.

Table IV-T3
Salaried

Termination Rates - 0-4 Years of Service						
		Retirements			Actual to Expected Ratios	
Age	Exposures	Actual	Current	Recommended	Current	Recommended
<25	-	-	-	-	0%	0%
25 - 29	14	-	1	1	0%	0%
30 - 34	32	2	3	2	63%	125%
35 - 39	21	2	2	1	95%	190%
40 - 44	12	-	1	1	0%	0%
45 - 49	16	-	2	1	0%	0%
50 - 54	20	1	2	1	50%	100%
55 - 59	-	-	-	-	0%	0%
60+	-	-	-	-	0%	0%
Total	**115**	**5**	**12**	**6**	**43%**	**87%**
R-squared			**0.2075**	**0.2075**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Table IV-T4 shows the calculation of actual-to-expected ratios and the r-squared statistic for Salaried members with five to twenty-four years of service, and Chart IV-T3 shows the information graphically.

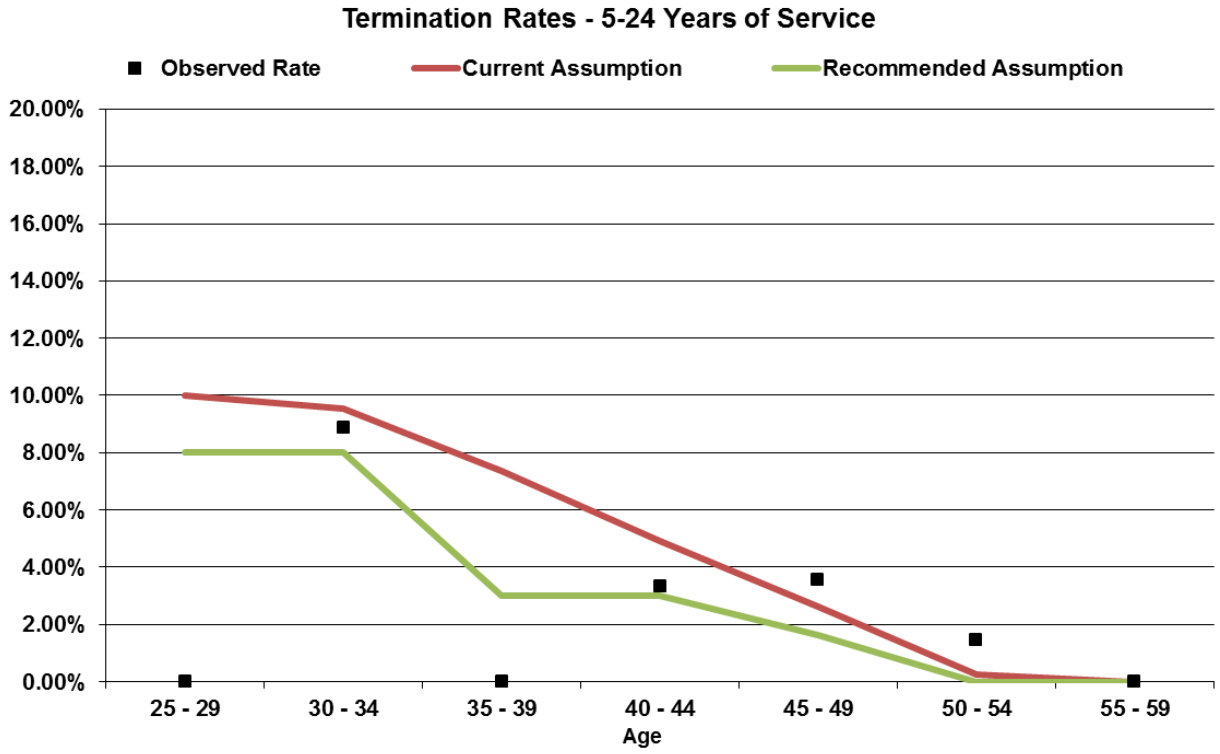
The data shows lower actual termination rates than expected under the current assumption. The proposed assumption decreases the assumed rates of termination and increases the aggregate A/E ratio from 74 percent to 123 percent. The r-squared increases from 0.20 to 0.29.

Table IV-T4
Salaried

Termination Rates - 5-24 Years of Service						
		Retirements			Actual to Expected Ratios	
Age	Exposures	Actual	Current	Recommended	Current	Recommended
<25	-	-	-	-	0%	0%
25 - 29	5	-	1	0	0%	0%
30 - 34	45	4	4	4	93%	111%
35 - 39	76	-	6	2	0%	0%
40 - 44	120	4	6	4	68%	111%
45 - 49	141	5	4	2	136%	219%
50 - 54	139	2	0	-	606%	0%
55 - 59	-	-	-	-	0%	0%
60+	-	-	-	-	0%	0%
Total	**526**	**15**	**20**	**12**	**74%**	**123%**
R-squared			**0.2029**	**0.2873**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Chart IV-T3
Salaried



SECTION IV - DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

This section analyzes the incidence of disability by the age of the employee. There is one set of assumptions for ATU and IBEW members at each age for both males and females, as well as a set of unisex assumptions for Salaried members at each age. The disability decrement is only applied after members are eligible for disability benefits.

The amount of disability experience is fairly limited; only 14 disabilities have occurred during the last four years for ATU and IBEW members and there were no disabilities among Salaried members.

Table IV-D1 shows the calculation of actual-to-expected ratios and the r-squared statistic for male ATU and IBEW members, and Chart IV-D1 shows the information graphically.

The data shows lower disability rates than expected. The proposed assumption decreases the assumed rates of disability and increases the aggregate A/E ratio from 29 percent to 57 percent. The r-squared is level at 0.11.

Table IV-D1

ATU/IBEW - Disability Incidence Rates (Males)						
Age Band	Exposures	Disabilities			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
20 - 24	-	0	-	-	0%	0%
25 - 29	-	0	-	-	0%	0%
30 - 34	9	0	0	0	0%	0%
35 - 39	38	0	0	0	0%	0%
40 - 44	83	0	1	1	0%	0%
45 - 49	170	1	3	1	37%	73%
50 - 54	225	3	4	2	74%	148%
55 - 59	240	0	5	2	0%	0%
60 - 64	191	1	4	2	24%	48%
65 - 69	62	0	-	-	0%	0%
70 +	8	0	-	-	0%	0%
Total	**1,026**	**5**	**17**	**9**	**29%**	**57%**
R-squared			**0.1135**	**0.1135**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Chart IV-D1

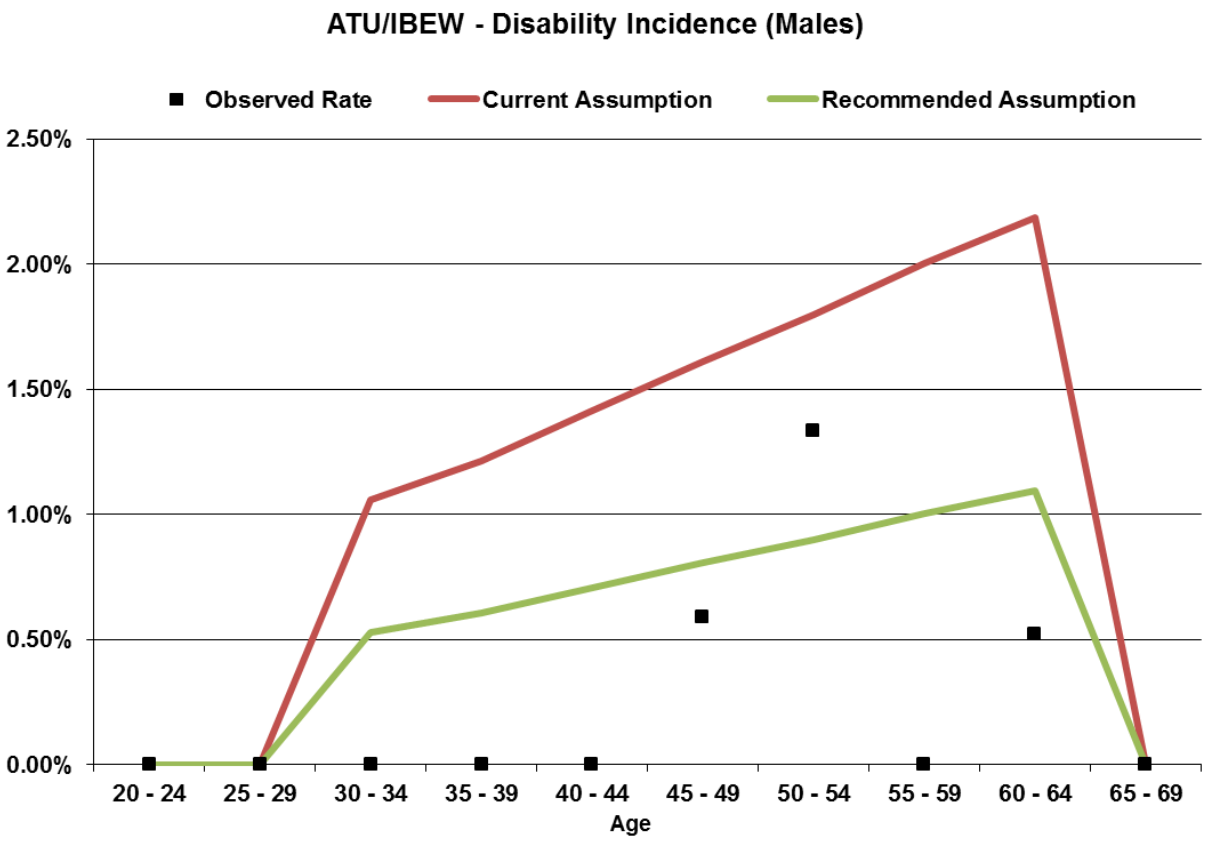


Table IV-D2 shows the calculation of actual-to-expected ratios and the r-squared statistic for female ATU and IBEW members, and Chart IV-D2 shows the information graphically.

The data shows lower disability rates than expected. The proposed assumption decreases the assumed rates of disability and increases the aggregate A/E ratio from 60 percent to 90 percent. The r-squared is level at 0.26.

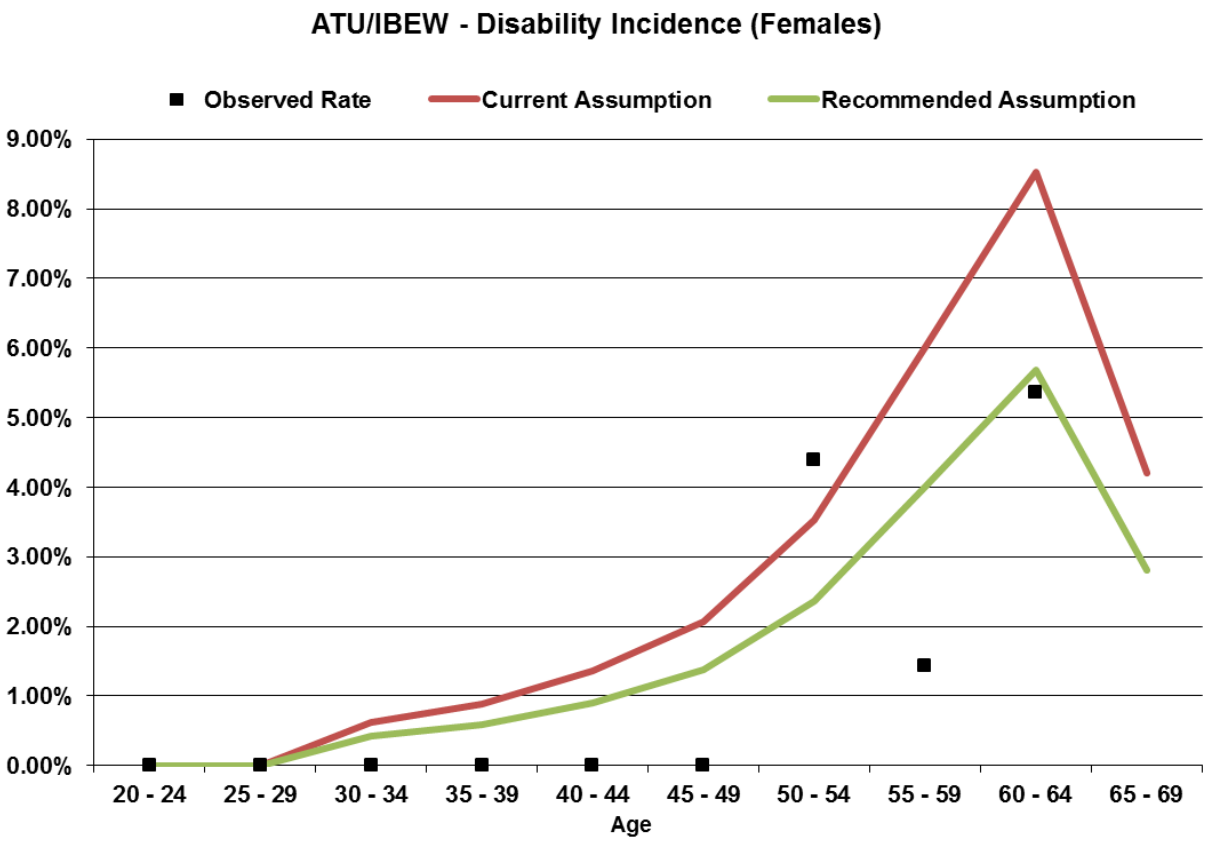
SECTION IV - DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Table IV-D2

ATU/IBEW - Disability Incidence Rates (Females)						
Age Band	Exposures	Disabilities			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
20 - 24	-	0	-	-	0%	0%
25 - 29	-	0	-	-	0%	0%
30 - 34	10	0	0	0	0%	0%
35 - 39	22	0	0	0	0%	0%
40 - 44	41	0	1	0	0%	0%
45 - 49	70	0	1	1	0%	0%
50 - 54	91	4	3	2	124%	186%
55 - 59	70	1	4	3	24%	36%
60 - 64	56	3	5	3	63%	94%
65 - 69	11	1	0	0	216%	325%
70 +	-	0	-	-	0%	0%
Total	**371**	**9**	**15**	**10**	**60%**	**90%**
R-squared			**0.2629**	**0.2629**		

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Chart IV-D2



There were no disabilities among Salaried members during the experience study, while we predicted three disabilities. We are proposing a 50% decrease in rates to the disability assumption for Salaried members.

SECTION IV - DEMOGRAPHIC ASSUMPTIONS

MORTALITY RATES

Post-retirement mortality assumptions are typically developed separately by gender for both healthy annuitants and disabled annuitants. Pre-retirement mortality assumptions are developed separately for males and females. Unlike most of the other demographic assumptions that rely exclusively on the experience of the plan, for mortality, standard mortality tables and projection scales serve as the primary basis for the assumption.

The Society of Actuaries recently completed an extensive mortality study and issued a set of mortality tables named the RP-2014 mortality tables and a mortality improvement projection scale named the MP-2015 scale. We used these tables as the basis for our analysis.

The steps in our analysis are as follows:

1. Select a standard mortality table that is based on experience most closely matching the anticipated experience of SacRT.
2. Compare actual SacRT experience to what would have been predicted by the selected standard table for the period of the experience study.
3. Adjust the standard table either fully or partially depending on the level of credibility for SacRT experience. This adjusted table is called the base table.
4. Select an appropriate standard mortality improvement projection scale and apply it to the base table.

Mortality assumptions are developed separately for active employees, healthy annuitants, and disabled annuitants. Within each of these groups, mortality rates are developed separately for males and females. Unlike most of the other demographic assumptions that rely exclusively on the experience of the plan, for mortality, standard mortality tables are used with standard modifications so that the aggregate experience matches the plan's experience.

Historically, we have proposed assumption changes when the Actual-to-Expected (A/E) ratio for the current assumption is less than 100%. However, for this study we are recommending a change in this approach going forward, where the proposed assumptions are intended to track closely to actual experience (i.e., an A/E ratio close to 100%). However, as described below, this new approach also includes an expectation that the assumed mortality rates will automatically become more conservative each year, since the actual mortality rates are also expected to decrease over time.

SECTION IV - DEMOGRAPHIC ASSUMPTIONS

MORTALITY RATES

In the prior study, SacRT elected to continue using the following assumptions:

Healthy active members

- The Retired Pensioners (RP) 2000 Male and Female Employee Mortality tables published by the Society of Actuaries.

Healthy retired, vested, and beneficiary members

- The Retired Pensioners (RP) 2000 Combined Healthy Blue Collar Male and Female tables published by the Society of Actuaries with no adjustment for male and a three year set-back for female ATU/IBEW members.
- The Retired Pensioners (RP) 2000 Combined Healthy White Collar Male and Female tables published by the Society of Actuaries with no adjustment for male and a three year set-back for female Salaried members.

Disabled members

- The Mortality Table for Disabled Participants Not Receiving Social Security Benefits published by the Pension Benefit Guaranty Corporation (PBGC).

Since the prior study, the Society of Actuaries' Retirement Plans Experience Committee (RPEC) has released a new mortality improvement scale, Scale MP-2015. The mortality improvements included in the most commonly used current projection scale - Scale AA - were found to produce some unsatisfactory results in projecting mortality. Scale MP-2015 reflects more up-to-date data, approximately 20 years more current than that used in the development of Scale AA, and it was reviewed against a significant amount of data drawn from California public plan experience.

MP-2015 represents the Society of Actuaries' most advanced actuarial methodology in incorporating mortality improvement trends with actual recent mortality rates, by using rates that vary not only by age but by calendar year – known as a two-dimensional approach to projecting mortality improvements. Scale MP-2015 was designed with the intent of being applied to mortality on a generational basis. The effect of this is to build in an automatic expectation of future improvements in mortality.

This is a different approach from building in a margin for conservatism in the current rates to account for the expectation that the same rates will be applied in future years, when mortality experience has improved. Recent reports issued by RPEC suggest that using generational mortality is a preferable approach, as it allows for an explicit declaration of the amount of future mortality improvement included in the assumptions.

RPEC has also recently released a new set of base mortality rate tables – the RP-2014 tables, which are intended to replace the RP-2000 tables and are based on a recent study of US defined benefit plan mortality experience. Separate tables were produced for Blue and White Collar workers. We are recommending the following assumptions:

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES

Active members

- RP-2014 Combined Healthy Blue Collar mortality with generational improvements using Scale MP-2015 for ATU and IBEW members, adjusted by 115% for males and 130% for females.
- RP-2014 Combined Healthy Employee mortality with generational improvements using Scale MP-2015 for Salaried members, adjusted by 130% for females and no adjustment for males.

Healthy retirees and beneficiaries

- RP-2014 Combined Healthy Blue Collar mortality with generational improvements using Scale MP-2015 for ATU and IBEW members, adjusted by 115% for males and 130% for females.
- RP-2014 Combined Healthy Annuitant mortality with generational improvements using Scale MP-2015 for Salaried members, adjusted by 130% for females and no adjustment for males.

Disabled members

- RP-2014 Disabled Annuitant mortality for ATU and IBEW members, adjusted by 120% for males and no adjustment for females.
- RP-2014 Disabled Annuitant mortality for Salaried members, adjusted by 130% for males and 115% for females.

Table IV-M1 on the next page shows our proposed mortality rates across all statuses compared to current rates. The amount of mortality experience for all members is fairly limited. To improve the credibility of the data, we have aggregated the experience of the past four years with that of the prior experience study (2006-2011). To perform our comparisons, the RP-2014 rates were projected from their base year (2014) back to the midpoint of the combined nine-year study period (2011).

Rather than weighting the experience based on the number of members living and dying, we have weighted the experience based on benefit size. This approach has been recommended by RPEC, since members with larger benefits are expected to live longer, and a benefit-weighted approach helps avoid underestimating the liabilities.

The match between the actual and expected experience across all annuitant statuses (retirees, surviving spouses, and disabled retirees) is reasonably close under the proposed assumptions: 110%. Normally for a large group where the actual number of deaths is greater than the expected number, we would adjust the base mortality rates upward to reflect the higher mortality rates for this group.

However, for SacRT, the data is not considered statistically fully credible, because the number of deaths and exposures is relatively small, even over the nine-year period from 2006-2015. Therefore we are only partially adjusting the base tables to match RT's experience, and thus we are comfortable that the ratio of actual to expected deaths is greater than 100% within some

SECTION IV - DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES

subgroups. Our experience in performing mortality studies with numerous transit groups – not just RT – has consistently shown higher mortality rates for transit workers than those of the groups included in the broad mortality studies.

Because of this, we are still assigning a higher level of credibility of RT's data than typical statistical theory would imply. The adjustment factors determined above (e.g., 115% for male ATU/IBEW) were determined based on an assumption that the credibility for retirees and spouses was three to four times greater than standard credibility theory would indicate. For active members, we used the same adjustment factors for the retirees, since there is little data.

Table IV-M1

Mortality Experience (2006-2015)

	Exposures	Total Actual Deaths	Actual Rates	Current Expected Deaths	Proposed Expected Deaths	Current A/E Ratio	Recommended A/E Ratio
Retired and Surviving Spouse							
ATU/IBEW Male	64,016,813	1,422,367	2.22%	1,443,058	1,367,115	99%	104%
ATU/IBEW Female	13,279,312	280,947	2.12%	156,117	242,496	180%	116%
AFSCME/Non-Rep Male	23,967,799	340,806	1.71%	353,409	344,782	96%	99%
AFSCME/Non-Rep Female	13,971,776	250,466	2.21%	92,580	162,722	271%	154%
Total Ret/Surv	115,235,700	2,294,586	1.99%	2,045,164	2,117,115	112%	108%
Disabled							
ATU/IBEW Male	9,194,660	415,492	4.52%	316,015	392,056	131%	106%
ATU/IBEW Female	13,279,312	280,947	2.12%	156,117	242,496	180%	116%
AFSCME/Non-Rep Male	1,489,679	88,761	5.96%	42,452	60,783	209%	146%
AFSCME/Non-Rep Female	233,817	7,216	3.09%	5,510	6,714	131%	107%
Total Disabled	24,197,467	792,416	3.27%	520,094	702,048	152%	113%
TOTAL	139,433,168	3,087,002	2.21%	2,565,258	2,819,163	120%	110%

SICK LEAVE

The current assumptions increase the liability for retirement benefits for ATU and IBEW active participants by 5.0% and by 7.0% for Salaried members to account for the impact of unused vacation and sick leave. During the last four valuation cycles, 92 ATU and IBEW members have retired from active service with final average pay averaging 5.7% higher than the amounts our valuation would have predicted; therefore, we believe the 5.0% assumption remains reasonable.

Between July 1, 2011 and June 30, 2015, there were 17 Salaried members who retired from active service. Their final average pay was 10.6% higher than what was expected. However, if we computed our expected average pay amounts using a lower inflation assumption - such as 1%, which is more reflective of recent wage increases, rather than the current actuarial rate of 3.15% - then the expected final average pay would be much closer to the actual amounts (within 6.7%). As a result, and because the data is very limited, we don't suggest an assumption change for Salaried members.

FAMILY COMPOSITION

The current assumption is that 100% of active SacRT active participants have beneficiaries eligible for pre-retirement death benefits and that male spouses are three years older than their wives. In their most recent experience study, CalPERS assumed that 85% of public employees were married, with male spouses three years older than their wives. Since we have limited spouse data, we have recommend the use of CalPERS' marriage assumption of 85% for eligibility for pre-retirement death benefits. We also recommend maintaining the current age difference assumption of three years, for both pre-retirement deaths and for valuing survivor benefits for current retirees with missing spouse dates of birth.

PLAN ADMINISTRATIVE EXPENSES

Allowances of approximately $192,000 for ATU/IBEW and $160,000 for the Salaried groups were assumed for 2015, based on the prior year expense assumptions, increased by the assumed rate of inflation. The Plan's administrative expenses in during the last two years have averaged approximately $210,000 for ATU/IBEW and $185,000 for the Salaried groups.

However, because of expected staffing changes, SacRT expects administrative expenses to increase for all groups. SacRT staff provided estimates of the expected administrative expenses for both groups for the 2017 Fiscal Year: just over $415,000 for ATU/IBEW and just under $290,000 for the Salaried plan. We recommend changing the Plan's assumed administrative expenses to match these estimates, increasing in future years at the assumed rate of inflation. These expected expense amounts are added to the normal cost and unfunded liability payment to determine the total actuarial contribution amount charged to the RT.

APPENDIX A - SUMMARY OF PROPOSED ASSUMPTIONS

The recommended demographic and economic assumptions were discussed with the Boards at their January 27, 2016 meetings and adopted by the Boards at their March 16, 2016 meeting. The demographic assumptions are based on an experience study covering the period from July 1, 2011 through June 30, 2015.

1. **Rate of Return**

   The annual rate of return on all Plan assets is assumed to be 7.50% net of investment expenses.

2. **Cost-of-Living**

   The cost-of-living as measured by the Consumer Price Index (CPI) will increase at the rate of 3.15% per year.

3. **Plan Expenses**

   An allowance of $415,260 for FY2017 ATU/IBEW Plan administrative expenses has been included in the annual cost calculated and will increase annually based on the assumed rate of inflation.

   An allowance of $288,340 for FY2017 Salaried Plan administrative expenses has been included in the annual cost calculated and will increase annually based on the assumed rate of inflation.

4. **Increases in Pay**

   Assumed pay increases for active Participants consist of increases due to cost-of-living adjustments and those due to longevity and promotion. Pay increases due to longevity and promotion are assumed to be the following:

   - ATU – 6% per year for the first ten years of service and 0.5% per year thereafter;
   - IBEW – 5% per year for the first six years of service and 0.25% per year thereafter;
   - AEA and MCEG – 3.25% per year for the first ten years of service and 0.5% thereafter; and,
   - AFSCME – 2% per year for the first 20 years of service and no increases thereafter.

   In addition, annual adjustments in pay due to the cost-of-living will equal the CPI, for an additional annual increase of 3.15%.

5. **Mortality Improvement**

   Mortality is assumed to improve in future years in accordance with the MP-2015 generational improvement tables.

APPENDIX A - SUMMARY OF PROPOSED ASSUMPTIONS

6. Active Participant Mortality

Rates of mortality for the ATU/IBEW active Participants are given by the Retired Pensioners (RP) 2014 Tables for Healthy Employees with Blue Collar Adjustments published by the Society of Actuaries with generational improvements using Scale MP-2015, with a 15% increase in mortality for male members and a 30% increase in mortality for female members.

Rates of mortality for the Salaried active Participants are given by the Retired Pensioners (RP) 2014 Tables for Healthy Employees without collar adjustments published by the Society of Actuaries with generational improvements using Scale MP-2015, with no adjustments for male members and a 30% increase in mortality for female members.

7. Retired Participant Mortality

Rates of mortality for the ATU/IBEW retired Participants, spouses and surviving spouses are given by the Retired Pensioners (RP) 2014 Tables for Healthy Annuitants with Blue Collar Adjustments published by the Society of Actuaries with generational improvements using Scale MP-2015, with a 15% increase in mortality for male members and a 30% increase in mortality for female members.

Rates of mortality for the Salaried retired Participants, spouses and surviving spouses are given by the Retired Pensioners (RP) 2014 Tables for Healthy Annuitants without collar adjustments published by the Society of Actuaries with generational improvements using Scale MP-2015, with no adjustments for male members and a 30% increase in mortality for female members.

8. Disabled Participant Mortality

Rates of mortality for ATU/IBEW disabled Participants are given by the Retired Pensioners (RP) 2014 Tables for Disabled Annuitants published by the Society of Actuaries with generational improvements using Scale MP-2015, with a 20% increase in mortality for male members and no adjustment for female members.

Rates of mortality for Salaried disabled Participants are given by the Retired Pensioners (RP) 2014 Tables for Disabled Annuitants published by the Society of Actuaries with generational improvements using Scale MP-2015, with a 30% increase in mortality for male members and a 15% increase in mortality for female members.

APPENDIX A - SUMMARY OF PROPOSED ASSUMPTIONS

9. Family Composition

85% of participants are assumed to have beneficiaries eligible for pre-retirement death benefits. For active Participants and current retirees without spouse information, male spouses are assumed to be three years older than their spouses.

10. Terminal Payments

Average Final Monthly Earnings are assumed to be increased by 5% for ATU/IBEW Participants and 7% for Salaried Participants due to the application of payments for unused vacation and sick leave.

11. Service Retirement

Rates of service retirement among ATU/IBEW Participants eligible to retire are given by the following table:

Rates of Retirement								
ATU				IBEW				
	Years of Service				Years of Service			
Age	10-24	25-29	30+	Age	5-9	10-24	25-29	30+
50-54	0.00%	9.60%	9.60%	50-54	0.00%	0.00%	2.00%	2.00%
55	7.20%	9.60%	9.60%	55-59	2.30%	2.30%	2.30%	10.00%
56-61	5.00%	9.60%	9.60%	60-64	4.00%	11.70%	11.70%	20.00%
62-64	20.00%	20.80%	20.80%	65	4.00%	32.00%	32.00%	32.00%
65	30.00%	30.00%	30.00%	66-69	4.00%	25.00%	25.00%	32.00%
66-69	25.00%	25.00%	25.00%	70+	100.00%	100.00%	100.00%	100.00%
70+	100.00%	100.00%	100.00%					

APPENDIX A - SUMMARY OF PROPOSED ASSUMPTIONS

Rates of service retirement among Salaried Participants eligible to retire are given by the following table:

Rates of Retirement			
	Years of Service		
Age	5-24	25-29	30+
50-54	0.00%	5.00%	25.00%
55-59	5.00%	5.00%	25.00%
60	15.00%	15.00%	15.00%
61-64	8.25%	8.25%	8.30%
65+	25.00%	25.00%	25.00%

12. Termination

Rates of termination for all ATU and IBEW Participants from causes other than death, disability, and service retirement are as follows:

Rates of Termination*		
Years of Service	ATU Rates	IBEW Rates
< 1	9.00%	8.00%
1-3	5.00%	8.00%
4	3.00%	8.00%
5-9	3.00%	5.00%
10-14	2.50%	2.75%
15-19	2.50%	0.50%
20-24	0.50%	0.50%
25+	0.00%	0.00%

* No terminations are assumed to occur after eligibility for retirement.

APPENDIX A - SUMMARY OF PROPOSED ASSUMPTIONS

Rates of termination for all Salaried Participants from causes other than death, disability, and service retirement are as follows:

Termination Rates*		
	0-4 Years	5+ Years
Age	All	All
20-34	5.00%	8.00%
35-44	5.00%	3.00%
45	5.00%	0.25%
46	5.00%	0.20%
47	5.00%	0.15%
48	5.00%	0.10%
49	5.00%	0.50%
50+	5.00%	0.00%

* No terminations are assumed after eligibility for normal retirement or after 25 years of service.

13. Disability

Rates of disability are based on the age and sex of the Participants. Sample rates are shown below:

ATU/IBEW Participants

Rates of Disability		
Age	Male	Female
22	0.30%	0.00%
27	0.40%	0.30%
32	0.50%	0.39%
37	0.60%	0.56%
42	0.70%	0.86%
47	0.80%	1.34%
52	0.90%	2.35%
57	1.00%	4.09%
62	1.10%	5.75%

APPENDIX A - SUMMARY OF PROPOSED ASSUMPTIONS

Salaried Participants

Rates of Disability	
Age	Rate
22	0.0184%
27	0.0237%
32	0.0289%
37	0.0368%
42	0.0525%
47	0.0814%
52	0.1418%
57	0.2599%
62	0.5382%

Rates are applied after the Participant becomes eligible to receive a disability benefit. Disabled Participants are not assumed to return to active service.

APPENDIX B - SUMMARY OF PRIOR ASSUMPTIONS

1. Rate of Return

The annual rate of return on all Plan assets is assumed to be 7.65% net of investment expenses.

2. Cost-of-Living

The cost-of-living as measured by the Consumer Price Index (CPI) will increase at the rate of 3.15% per year.

3. Plan Expenses

An allowance of $180,000 for FY2014 ATU/IBEW Plan administrative expenses has been included in the annual cost calculated and will increase annually based on the assumed rate of inflation.

An allowance of $150,000 for FY2014 Salaried Plan administrative expenses has been included in the annual cost calculated and will increase annually based on the assumed rate of inflation.

4. Increases in Pay

Assumed pay increases for active Participants consist of increases due to cost-of-living adjustments and those due to longevity and promotion. Pay increases due to longevity and promotion are assumed to be the following:

- ATU – 9% per year for the first six years of service and 0.5% per year thereafter;
- IBEW – 5% per year for the first six years of service and 0.25% per year thereafter;
- AEA and MCEG – 12% per year for the first three years of service and 0.5% thereafter; and,
- AFSCME – 5% per year for the first five years of service, 1.25% for the next sixteen years and no increases thereafter.

In addition, annual adjustments in pay due to the cost-of-living will equal the CPI, for an additional annual increase of 3.15%.

APPENDIX B - SUMMARY OF PRIOR ASSUMPTIONS

5. Mortality Improvement

No mortality improvement is explicitly assumed; however, we build a margin in our mortality assumption between the actual and expected number of deaths in order to assume some future mortality improvements. The experience study report for the period covering July 1, 2006 to June 30, 2011 contains a full description of these margins.

6. Active Participant Mortality

Rates of mortality for all active Participants are given by the Retired Pensioners (RP) 2000 Male and Female Employee Mortality Tables published by the Society of Actuaries.

7. Retired Participant Mortality

Rates of mortality for the ATU/IBEW retired Participants, spouses and surviving spouses are given by the Retired Pensioners (RP) 2000 Combined Healthy Blue Collar Male and Female Tables published by the Society of Actuaries, with a three year setback for females and no adjustment for males.

Rates of mortality for the Salaried retired Participants, spouses and surviving spouses are given by the Retired Pensioners (RP) 2000 Combined Healthy White Collar Male and Female Tables published by the Society of Actuaries, with a three year setback for females and no adjustment for males.

8. Disabled Participant Mortality

Rates of mortality for all disabled Participants are given by the Mortality Table for Disabled Participants Not Receiving Social Security Benefits published by the Pension Benefit Guaranty Corporation (PBGC).

APPENDIX B - SUMMARY OF PRIOR ASSUMPTIONS

9. Family Composition

All Participants are assumed to have beneficiaries eligible for pre-retirement death benefits. For active Participants and current retirees without spouse information, male spouses are assumed to be three years older than their spouses.

10. Terminal Payments

Average Final Monthly Earnings for members who retire from active status are assumed to be increased by 5% for ATU/IBEW Participants and 7% for Salaried Participants due to the application of payments for unused vacation and sick leave.

11. Service Retirement

Rates of service retirement among ATU/IBEW Participants eligible to retire are given by the following table:

Rates of Retirement									
ATU				IBEW					
	Years of Service				Years of Service				
Age	10-24	25-29	30+	Age	5-9	10-24	25-29	30	31+
50-54	0.00%	4.80%	9.60%	50-54	0.00%	0.00%	4.80%	25.00%	15.00%
55-61	7.20%	9.60%	19.20%	55-59	4.00%	4.00%	9.60%	25.00%	15.00%
62-64	15.60%	20.80%	41.60%	60	4.00%	25.00%	9.60%	25.00%	25.00%
65	50.00%	50.00%	50.00%	61	4.00%	9.60%	9.60%	25.00%	25.00%
66-69	32.00%	32.00%	32.00%	62-64	4.00%	20.80%	20.80%	25.00%	25.00%
70+	100.00%	100.00%	100.00%	65	4.00%	50.00%	50.00%	50.00%	50.00%
				66-69	4.00%	32.00%	32.00%	32.00%	32.00%
				70+	100.00%	100.00%	100.00%	100.00%	100.00%

APPENDIX B - SUMMARY OF PRIOR ASSUMPTIONS

Rates of service retirement among Salaried Participants eligible to retire are given by the following table:

Rates of Retirement*				
	Years of Service			
Age	5-9	10-19	20-24	25-29
50-54	0.00%	0.00%	0.00%	5.00%
55	10.00%	15.00%	20.00%	20.00%
56-59	5.00%	10.00%	20.00%	20.00%
60+	25.00%	25.00%	25.00%	25.00%

*The rate of service retirement among all Participants eligible to retire with 30 or more years of service is assumed to be 25.0% per year, and 100% per year for all Participants 70 or older.

12. Termination

Rates of termination for all ATU and IBEW Participants from causes other than death, disability, and service retirement are as follows:

Rates of Termination*		
Years of Service	ATU Rates	IBEW Rates
< 1	9.00%	9.00%
1-2	5.00%	5.00%
3	5.00%	3.50%
4	3.00%	3.50%
5-9	3.00%	2.00%
10-19	2.00%	0.50%
20-24	0.50%	0.50%
25+	0.00%	0.00%

*No terminations are assumed to occur after eligibility for retirement or after 25 years of service for non-PEPRA members. PEPRA members terminating with at least five years of service are expected to receive a deferred annuity benefit; those terminating with less than five years of service are expected to receive a refund of contributions (with interest).

APPENDIX B - SUMMARY OF PRIOR ASSUMPTIONS

Rates of termination for all Salaried Participants from causes other than death, disability, and service retirement are as follows:

Termination Rates*		
	0-4 Years	5+ Years
Age	All	All
20-32	10.0%	10.0%
33	10.0%	9.5%
34	10.0%	9.0%
35	10.0%	8.5%
36	10.0%	8.0%
37	10.0%	7.5%
38	10.0%	7.0%
39	10.0%	6.5%
40	10.0%	6.0%
41	10.0%	5.5%
42	10.0%	5.0%
43	10.0%	4.5%
44	10.0%	4.0%
45	10.0%	3.5%
46	10.0%	3.0%
47	10.0%	2.5%
48	10.0%	2.0%
49	10.0%	1.5%
50	10.0%	1.0%
51	10.0%	0.5%
52+	10.0%	0.0%

*No terminations are assumed after eligibility for normal retirement or after 25 years of service.

APPENDIX B - SUMMARY OF PRIOR ASSUMPTIONS

13. Disability

Rates of disability are based on the age and sex of the Participants. Sample rates are shown below:

ATU/IBEW Participants

Rates of Disability		
Age	Male	Female
22	0.60%	0.00%
27	0.80%	0.45%
32	1.00%	0.59%
37	1.20%	0.84%
42	1.40%	1.29%
47	1.60%	2.02%
52	1.80%	3.53%
57	2.00%	6.13%
62	2.20%	8.62%

Salaried Participants

Rates of Disability	
Age	Rate
22	0.037%
32	0.058%
42	0.105%
52	0.284%
62	1.076%
65	1.680%
66+	0.000%

Rates are applied after the Participant becomes eligible to receive a disability benefit. Disabled Participants are not assumed to return to active service.