

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. However, RPEC excluded all public pension plan data in the construction of these tables - including a large amount of California public sector data - because there were significant differences between the private and public sector retirement experience, and the new tables are expected to be used by private sector plans to meet accounting and federal funding requirements specific to private plans.

Fortunately, there is an alternative set of assumptions that have been recently developed that may serve as a logical basis for developing mortality assumptions for MCERA. As part of an Experience Study completed in 2014, CalPERS adopted a new set of mortality tables for active, retired and disabled members. MCERA’s experience over the past six years matches well with the new CalPERS rates, after removing the improvement projections included by CalPERS and replacing them with the new MP-2014 mortality improvement projections through the mid-point of the six year period (2008-2014). As such, we are recommending the following assumptions:

Active members, retirees and beneficiaries	CalPERS 2014 Pre-Retirement Non-Industrial Death rates (plus Duty-Related Death rates for Safety Members), with the 20-year static projection used by CalPERS replaced by generational improvements using Scale MP-2014.
Healthy retirees and beneficiaries	CalPERS 2014 Post-Retirement Healthy Mortality rates, adjusted by 110% for Safety Males and 95% for Miscellaneous and Safety Females, with the 20-year static projection used by CalPERS replaced by generational improvements using Scale MP-2014.
Disabled members	CalPERS 2014 Disability Mortality rates (Non-Industrial rates for Miscellaneous members and Industrial Disability rates for Safety members), adjusted by 90% for Males and Females (Miscellaneous and Safety) with the 20-year static projection used by CalPERS replaced by generational improvements using Scale MP-2014.

As shown in Table III-1 below, our proposed mortality rates for healthy annuitants are very close to recent experience. As we have done in prior experience studies, we have combined the experience of the past three years with that of the prior three year period in order to have a more robust dataset to review. To perform our comparisons, the CalPERS rates (without projection) were projected from their base year (2009) to the midpoint of the combined six-year study period (2011).

The match between the actual and expected experience across all statuses (active, retired, disabled) is very close under the proposed assumptions: 96.0%. It may appear that the match under the prior assumptions is even closer (97.8%); however, the prior assumptions do not include any assumptions or margins for future improvement in mortality. We are comfortable that the ratio of active to expected deaths is less than 100% within some subgroups, since as described above, the use of generational mortality assumptions will automatically result in mortality assumptions that decrease over time. In particular, the number of deaths among the disabled members and the female Safety members and beneficiaries is somewhat lower than expected, but these groups have the smallest amount of overall experience.

	Exposures	Total Actual Deaths	Actual Rates	Current Expected Deaths	Proposed Expected Deaths	Current A/E Ratio	Proposed A/E Ratio
<u>Actives</u>							
Misc Male	4,827	14	0.29%	11.5	10.0	122.1%	140.5%
Misc Female	7,359	8	0.11%	15.6	10.2	51.2%	78.1%
Safety Male	3,006	3	0.10%	3.2	3.7	94.0%	81.4%
Safety Female	523	1	0.19%	0.5	0.5	216.6%	211.9%
Total Actives	15,715	26	0.17%	30.7	24.4	84.6%	106.7%
<u>Retired and Surviving Spouse</u>							
Misc Male	3,442	108	3.14%	107.0	107.0	100.9%	100.9%
Misc Female	6,769	204	3.01%	199.4	207.3	102.3%	98.4%
Safety Male	1,893	30	1.58%	25.2	30.4	119.0%	98.7%
Safety Female	832	14	1.68%	18.3	19.5	76.6%	71.6%
Total Ret/Surv	12,936	356	2.75%	349.9	364.3	101.7%	97.7%
<u>Disabled</u>							
Misc Male	372	12	3.23%	10.1	12.5	118.9%	96.1%
Misc Female	515	6	1.17%	9.5	11.2	63.5%	53.7%
Safety Male	1,083	11	1.02%	19.1	14.7	57.7%	74.8%
Safety Female	161	0	0.00%	0.9	0.9	0.0%	0.0%
Total Disabled	2,131	29	1.36%	39.5	39.2	73.4%	73.9%
TOTAL	30,782	411	1.34%	420.1	427.9	97.8%	96.0%

In addition to being used to compute the liabilities of the Plan, mortality assumptions are also required in the calculation of member contribution rates and in circumstances where an actuarial

equivalence calculation is required (such as in the optional form adjustment factors used in the Plan's benefit administration software).

There are administrative reasons why using a generational mortality table may prove difficult to implement currently, because of the nuances of the laws governing the calculation of employee rates for Legacy members or because of the requirements of the Plan's benefit administration software. Fortunately, it is possible to approximate the use of a generational mortality table by the use of a static table, and projecting mortality improvement from the base period to the average duration of the projected benefit payments.

For MCERA, the average duration of the benefit payments for active members is approximately 20 years. Therefore, for the calculation of Legacy member rates we recommend the use of the same base tables as recommended above (blended 40%/60% M/F for Miscellaneous members and 85%/15% M/F for Safety members), but with a static projection to the year 2037 (the mid-point of the valuation dates to which these assumptions are expected to apply, plus 20-year duration). The calculation of the member rates for the PEPRA tiers does not require a static projection, as the assumptions used to develop these member rates is based upon the same assumptions used to compute the total normal cost rates as part of the actuarial valuation.

For actuarial equivalence calculations required in the calculation of optional benefit forms, we will work with the provider of MCERA's benefit administration software and review their capacity to use generational mortality tables. If they are unable to implement the recommended generational assumptions, we will work with them to develop an appropriate static table based on the approaches described above.

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.

Charts III-1 and III-2 on the following pages compare the current pay patterns for Miscellaneous and Safety members compared to the 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 MCERA as of July 1, 2014 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.

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). For a more detailed description of this type of study and its advantages, see the Methodology section at the end of this report.

Chart III-1 below shows the average pay by years of service under the current assumption (green line) compared to the actual experience (purple dots) for Miscellaneous employees. We have also proposed a replacement set of assumptions (red line), which reflect higher pay increases in the first five years of service and provide a closer match with the actual pattern reflected in the data.

Chart III-1

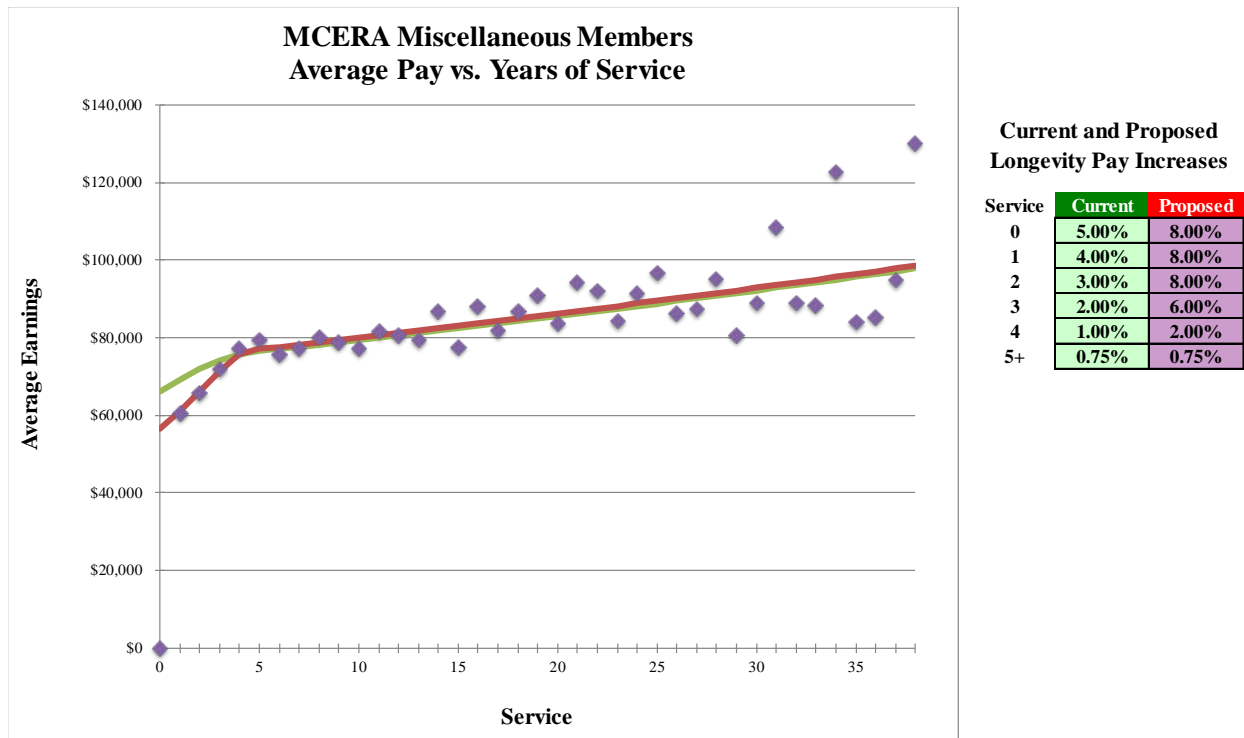
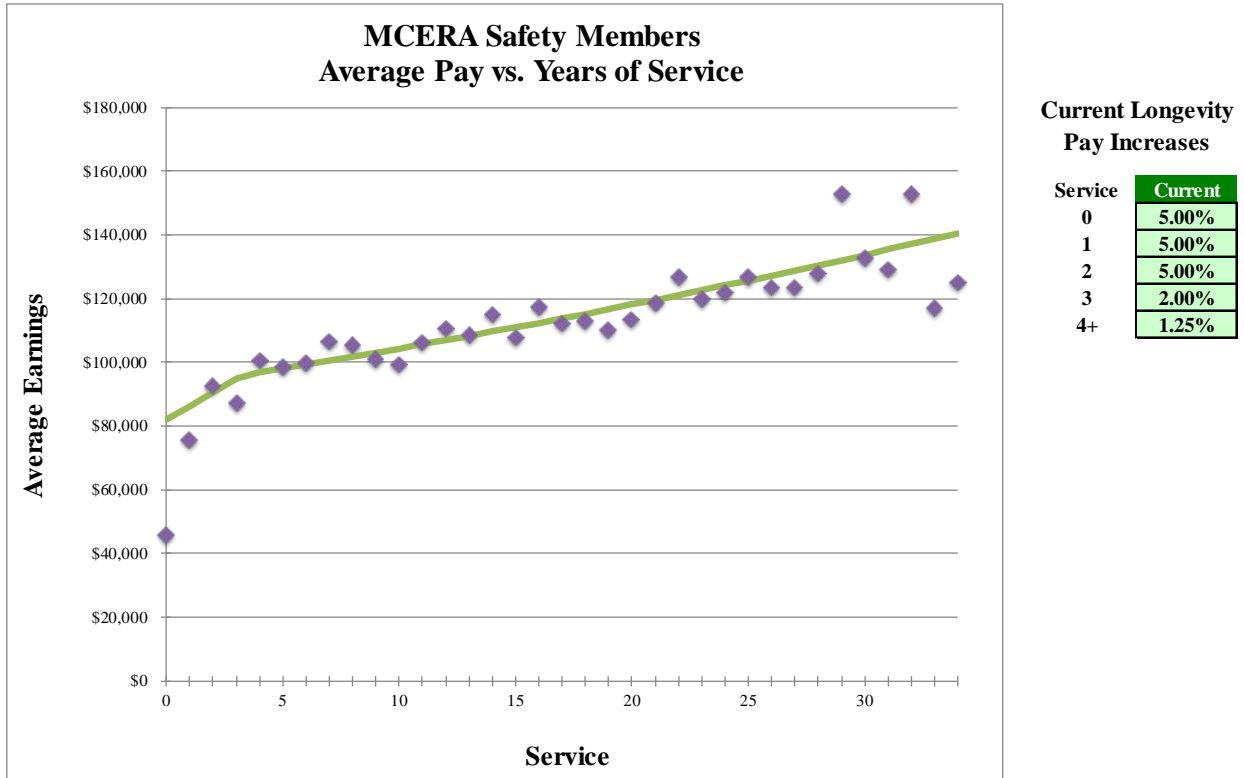


Chart III-2 below shows the average pay by years of service under the current assumption (green line) compared to the actual experience (purple dots) for Safety employees.

Chart III-2



Since the actual pay data is in close accord with the assumed rates of merit increase for Safety employees, no change to the assumed rates is recommended.

RATES OF RETIREMENT

In this section, we develop our analysis of rates of retirement. For each membership group studied, we determined the ratio of the actual number of retirements at each age compared to the expected number of retirements. If the assumption is perfect, this ratio will be 100%. We generally propose assumption changes when the current assumption is clearly outside a reasonable range of the observed experience.

However, 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. For this Study, we have combined the experience of the past three years (2011-2014) with that of the prior Study period (2008-2011) to obtain a more robust dataset.

The assumptions for Miscellaneous County Tier 3A, Courts Tier 4 and San Rafael Tier 2 employees start at age 55 with 10 years of service, while the assumptions for Miscellaneous Legacy employees in all other plans start at age 50 with 10 years of service. Normal Retirement assumptions for Miscellaneous PEPRA employees start at age 52 with 5 years of service. All non-PEPRA Miscellaneous members may retire at any age with 30 years of service, and all Miscellaneous members may retire without a service requirement at age 70.

In general, the retirement rates for the Miscellaneous members have been lower than assumed over the past six years. As there is yet no retirement experience among PEPRA Miscellaneous members, we continue to recommend the same set of retirement assumptions for this group, with the caveat that they will only be applied once a member is eligible to retire (i.e. at age 52 with 5 years of service).

Previously, once a MCERA Miscellaneous employee reached age 70, we assumed 100% probability of retirement. Based on recent experience, we have extended the age at which a 100% retirement probability is applied to Miscellaneous employees to age 80.

We have also proposed moderate reductions in the Miscellaneous retirement rates for those between the ages of 55 and 61 with less than 20 years of service, and reductions in the Miscellaneous retirement rates at ages 65 and above for those with less than 30 years of service.

Chart III-3 on the next page shows a graphical comparison of the actual, current and proposed rates of retirement by age for Miscellaneous members. Chart III-4 shows additional comparisons, demonstrating that the proposed assumptions also provide a closer match between the assumptions and actual experience when analyzed by the amount of service at retirement, rather than age.

**Chart III-3: MCERA Miscellaneous
Comparison of Actual and Expected Retirement Rates**



**Chart III-4: MCERA Miscellaneous
Comparison of Actual and Expected Retirements**

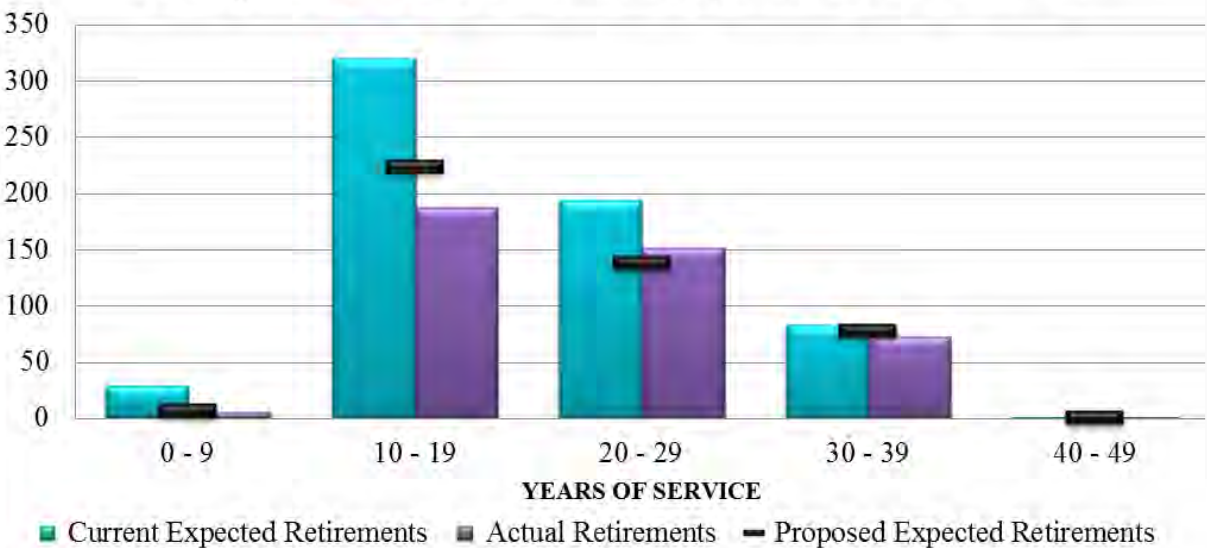


Table III-2 shows more detail on these calculations, including actual to expected ratios and retirement ages, and demonstrates that the proposed unisex assumptions provide a reasonable match for both genders.

Table III-2: Miscellaneous Retirement Experience (2008-2014)							
	Eligible Exposures	Actual Retirements	Actual Rates	Current Expected Retirements	Proposed Expected Retirements	Current A/E Ratio	Proposed A/E Ratio
Male	1,625	161	9.91%	223.5	171.9	72.0%	93.7%
Female	2,458	258	10.50%	402.7	272.2	64.1%	94.8%
Combined	4,083	419	10.26%	626.2	444.1	66.9%	94.4%
Average Retirement Age							
			Actual	Current Expected	Proposed Expected		
Male			60.9	62.7	60.6		
Female			62.1	64.9	62.3		
Combined			61.7	64.1	61.6		

Table III-3 provides the details on the current and proposed assumptions at each age and service level.

**Table III-3
Current and Proposed Miscellaneous Retirement Rates**

Age	Current		Proposed		
	<30 Years of Service	30+ Years of Service	<20 Years of Service	20-29 Years of Service	30+ Years of Service
50-54	4.00%	4.00%	4.00%	4.00%	4.00%
55	10.00%	25.00%	8.00%	10.00%	25.00%
56	4.00%	25.00%	4.00%	4.00%	25.00%
57	6.00%	25.00%	4.00%	6.00%	25.00%
58	8.00%	25.00%	4.00%	8.00%	25.00%
59	10.00%	25.00%	8.00%	10.00%	25.00%
60-61	10.00%	35.00%	8.00%	10.00%	35.00%
62-64	20.00%	35.00%	20.00%	20.00%	35.00%
65-69	25.00%	35.00%	20.00%	20.00%	35.00%
70-74	100.00%	100.00%	20.00%	20.00%	35.00%
75-79	100.00%	100.00%	25.00%	25.00%	35.00%
80+	100.00%	100.00%	100.00%	100.00%	100.00%

Normal Retirement assumptions for Safety employees start at age 50 with 10 years of service (5 years for PEPRA members). All non-PEPRA Safety members may retire at any age with 20 years of service, and all Safety members may retire without a service requirement at age 70.

Overall, the retirement rates for the Safety members have been close to the number assumed over the past six years. However, we have proposed revised rates which would have predicted a similar number of total retirements, but provided a closer match at particular age intervals. We have not analyzed the experience by gender – as there is little female Safety data – but we have continued to analyze the retirement data separately for those with the 3% at 50 versus 3% at 55 benefit formulas. As there is yet no retirement experience among PEPRA Safety members, we continue to recommend the use of the 3% at 55 retirement assumptions for this group.

Previously, once a Safety Miscellaneous employee reached age 60, we assumed 100% probability of retirement. Based on recent experience, we have extended the age at which a 100% retirement probability is applied to age 65.

We have also proposed the introduction of a moderate retirement rate for those ages of 40 to 49 with at least 20 years of service. For the 3% at 55 members, we have proposed an increase in the retirement rates for those ages 50 to 53 with at least 30 years of service, and increase for those ages 55 to 59 with at least 20 years of service. Minor changes were also proposed for those ages 55 to 59 with less than 20 years of service.

Chart III-5 shows a graphical comparison of the actual, current and proposed rates of retirement by age for Safety members.

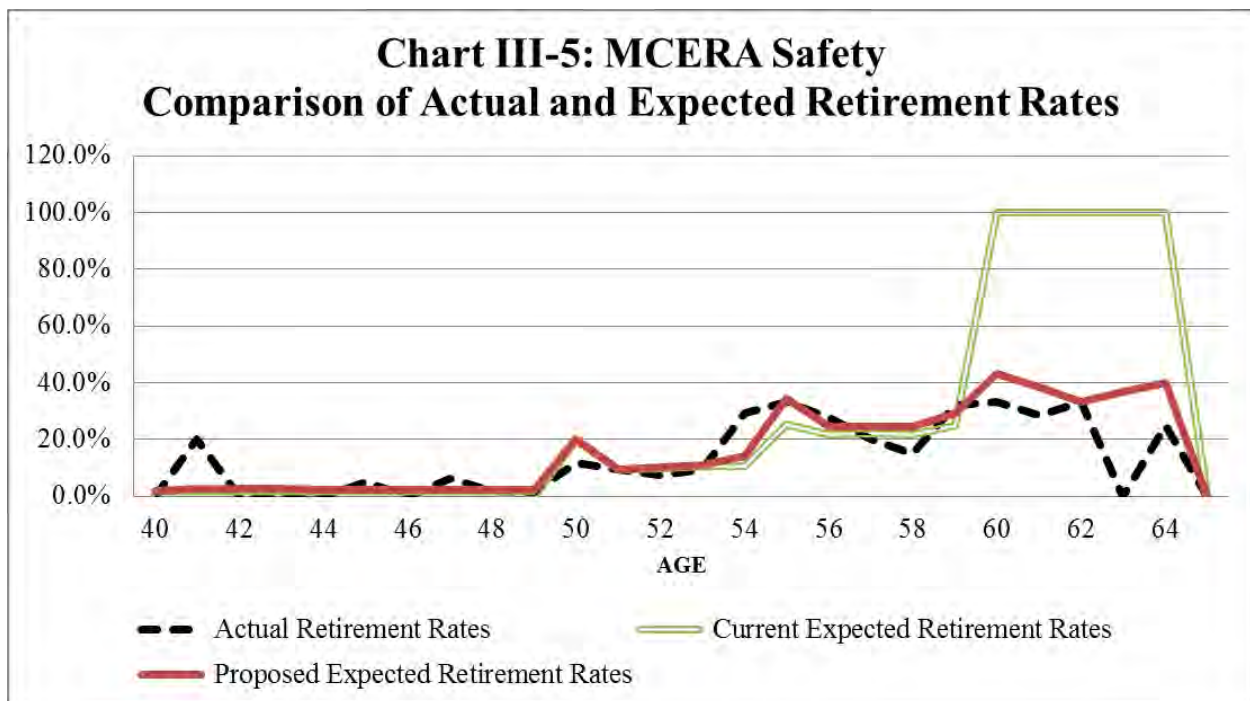


Chart III-6 shows additional comparisons by age, demonstrating that the proposed assumptions also provide a closer match at various age intervals.

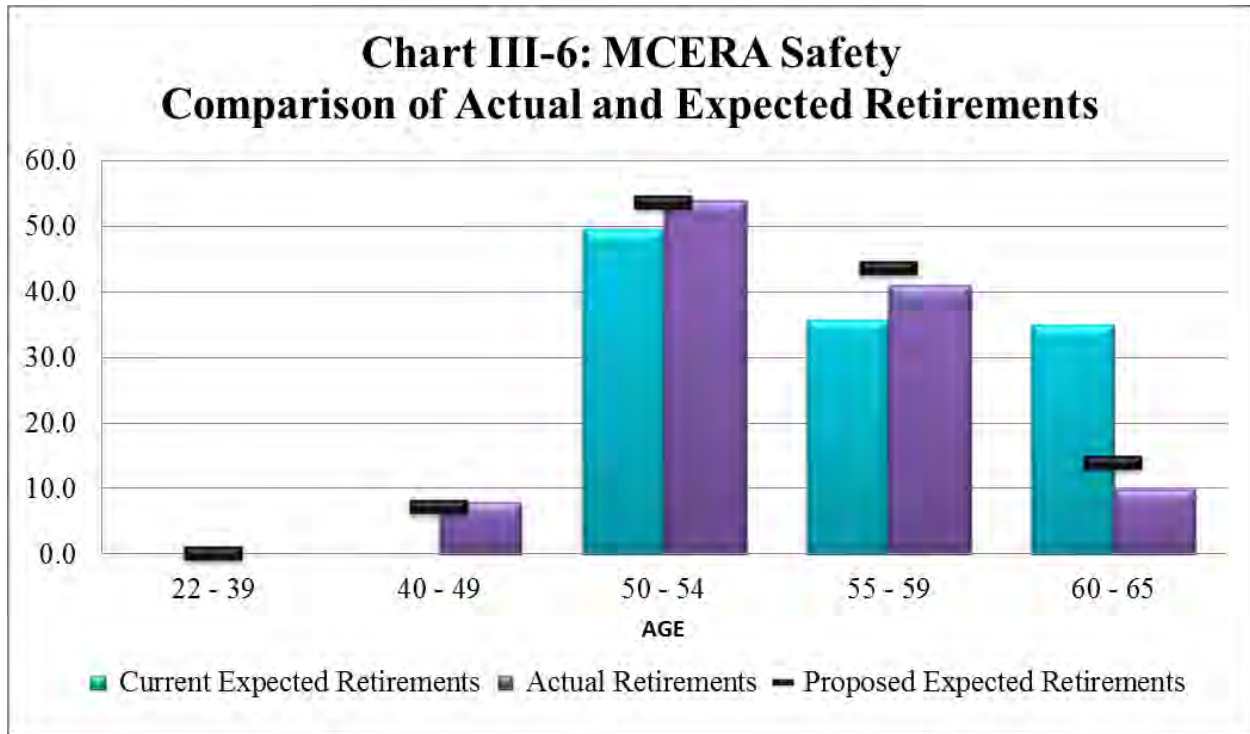


Table III-4 shows the more detail on these calculations, including actual to expected ratios and retirement ages, and demonstrates that the proposed assumptions provide a reasonable match for both benefit formulas.

	Eligible Exposures	Actual Retirements	Actual Rates	Current Expected Retirements	Proposed Expected Retirements	Current A/E Ratio	Proposed A/E Ratio
3% @ 50	522	65	12.45%	69.9	69.3	93.1%	93.8%
3% @ 55	393	48	12.21%	50.6	48.9	95.0%	98.2%
Combined	915	113	12.35%	120.4	118.2	93.9%	95.6%
Average Retirement Age							
			Actual	Current Expected	Proposed Expected		
3% @ 50			53.4	54.8	53.4		
3% @ 55			55.3	57.4	55.4		
Combined			54.2	55.9	54.3		

Tables III-5 and III-6 provide the details on the current and proposed assumptions at each age and service level.

**Table III-5
Current and Proposed 3% @ 50 Safety Retirement Rates**

Age	Current		Proposed		
	<30 Years of Service	30+ Years of Service	<20 Years of Service	20-29 Years of Service	30+ Years of Service
40-49	0.00%	0.00%	0.00%	3.00%	3.00%
50	25.00%	50.00%	25.00%	25.00%	50.00%
51-54	10.00%	20.00%	10.00%	10.00%	20.00%
55-59	25.00%	50.00%	25.00%	25.00%	50.00%
60-64	100.00%	100.00%	50.00%	50.00%	50.00%
65	100.00%	100.00%	100.00%	100.00%	100.00%

**Table III-6
Current and Proposed 3% @ 55 (and PEPRA) Safety Retirement Rates**

Age	Current		Proposed		
	<30 Years of Service	30+ Years of Service	<20 Years of Service	20-29 Years of Service	30+ Years of Service
40-49	0.00%	0.00%	0.00%	1.00%	1.00%
50-53	5.00%	25.00%	5.00%	5.00%	30.00%
54	5.00%	25.00%	5.00%	15.00%	30.00%
55	15.00%	30.00%	20.00%	40.00%	50.00%
56	15.00%	30.00%	10.00%	30.00%	50.00%
57-59	15.00%	30.00%	10.00%	20.00%	50.00%
60-64	100.00%	100.00%	30.00%	30.00%	50.00%
65	100.00%	100.00%	100.00%	100.00%	100.00%

DISABILITY RATES

This section analyzes the incidence of disability by the age of the employee. We determined the ratio of the actual number of disabilities at each age compared to the expected number of disabilities. To produce a larger dataset, we combined experience from the current study period (2011-2014) with that of the prior study (2008-2011). Exposures for ordinary disabilities are counted once members are eligible for an ordinary disability: after earning five years of service. Exposures for duty-related disabilities are included at all years of service, since there is no service requirement for a duty disability.

As shown in Table III-7 and Table III-8 on the following pages, the incidence of duty disability for Miscellaneous females and ordinary disability for Safety members have been lower than the current assumptions, while the incidence of disability for other groups was reasonably close to expected. We have recommended reducing the Miscellaneous female duty disability rates by 50%, as the number of actual disabilities was significantly lower than the number assumed (2 actual versus over 10 assumed). However, we have not recommended a change to the Safety ordinary disability rates, as the actual and expected number of disabilities are both quite low (4 actual versus 6.3 assumed), which means that a small number of additional disabilities could change the A/E ratios significantly.

We recognize that some of the proposed A/E ratios – particularly for the Safety ordinary disabilities, Miscellaneous male ordinary and female duty disabilities - are still significantly below 100%. However, the disability rates were also reduced significantly at the time of the last experience study, and the incidence of disability is quite low.

Table III-7: Duty Disability Experience (2008-2014)							
	Eligible Exposures	Actual Duty Disab	Actual Rates	Current Expected Disabilities	Proposed Expected Disabilities	Current A/E Ratio	Proposed A/E Ratio
Misc Male	4,827	5	0.10%	6.7	6.7	74.1%	74.1%
Misc Female	7,359	2	0.03%	10.2	5.1	19.6%	39.2%
Misc Combined	12,186	7	0.06%	17.0	11.8	41.3%	59.1%
Safety	3,514	21	0.60%	22.7	22.7	92.4%	92.4%
<u>Average Disability Age</u>							
			Actual	Current Expected	Proposed Expected		
Misc Male			49.8	52.0	52.0		
Misc Female			60.0	52.5	52.5		
Misc Combined			52.7	52.3	52.2		
Safety			47.2	47.2	46.9		

Table III-8: Ordinary Disability Experience (2008-2014)

	Eligible Exposures	Actual Ord Disab	Actual Rates	Current Expected Disabilities	Proposed Expected Disabilities	Current A/E Ratio	Proposed A/E Ratio
Misc Male	3,712	1	0.03%	2.6	2.6	38.9%	38.9%
Misc Female	5,555	5	0.09%	4.1	4.1	121.0%	121.0%
Misc Combined	9,267	6	0.06%	6.7	6.7	89.6%	89.6%
Safety	2,880	4	0.14%	6.3	6.3	63.5%	63.5%
<u>Average Disability Age</u>							
			Actual	Current Expected	Proposed Expected		
Misc Male			57.0	57.9	57.9		
Misc Female			58.8	58.8	58.8		
Misc Combined			58.5	58.5	58.5		
Safety			50.0	47.4	47.4		

Tables III-9 and III-10 provide the details on the current and proposed assumptions at sample ages.

**Table III-9
Current and Proposed Duty Disability Rates**

Age	Miscellaneous			Safety
	Male	Female Current	Female Proposed	
20	0.0250%	0.0250%	0.0125%	0.0605%
25	0.0400%	0.0400%	0.0200%	0.0825%
30	0.0650%	0.0650%	0.0325%	0.1980%
35	0.0800%	0.0800%	0.0400%	0.3025%
40	0.1050%	0.1050%	0.0525%	0.6490%
45	0.1300%	0.1300%	0.0650%	0.6270%
50	0.1550%	0.1550%	0.0775%	0.7040%
55	0.1650%	0.1650%	0.0825%	2.1450%
60	0.1850%	0.1850%	0.0925%	0.0000%
65	0.1950%	0.1950%	0.0975%	0.0000%

Table III-10

Current Ordinary Disability Rates (no changes proposed)

Age	Miscellaneous	Safety
20	0.0000%	0.0200%
25	0.0025%	0.0300%
30	0.0050%	0.0500%
35	0.0075%	0.0700%
40	0.0125%	0.1600%
45	0.0225%	0.2600%
50	0.0450%	0.3600%
55	0.0775%	0.4600%
60	0.1275%	0.0000%
65	0.1975%	0.0000%

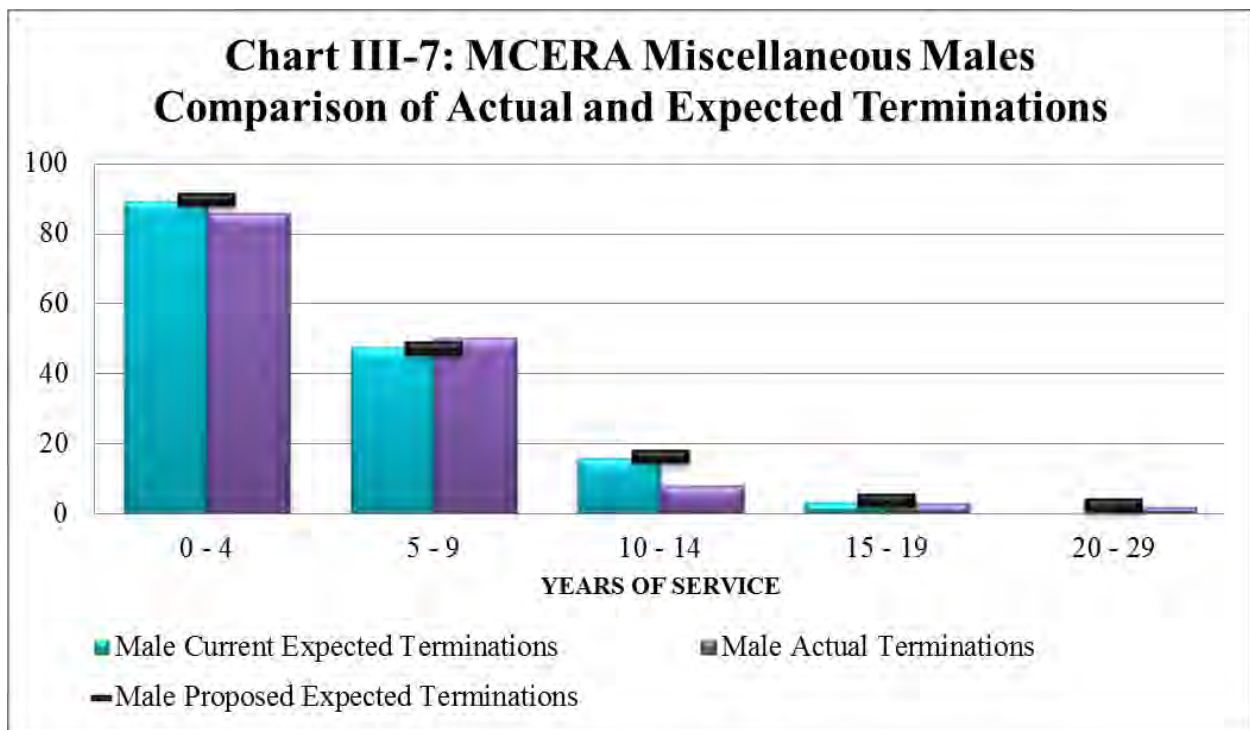
TERMINATION RATES

Rates of termination from active employment for reasons other than death, disability and retirement have a significant impact on the cost of the plan. For this assumption, we have again included in our analyses the last six years of experience (from 2008-2014), rather than reviewing the information over the past three years. This allows us to formulate a larger, more robust dataset, and will also reduce the impact of any unusual termination experience which may have happened over the past few years.

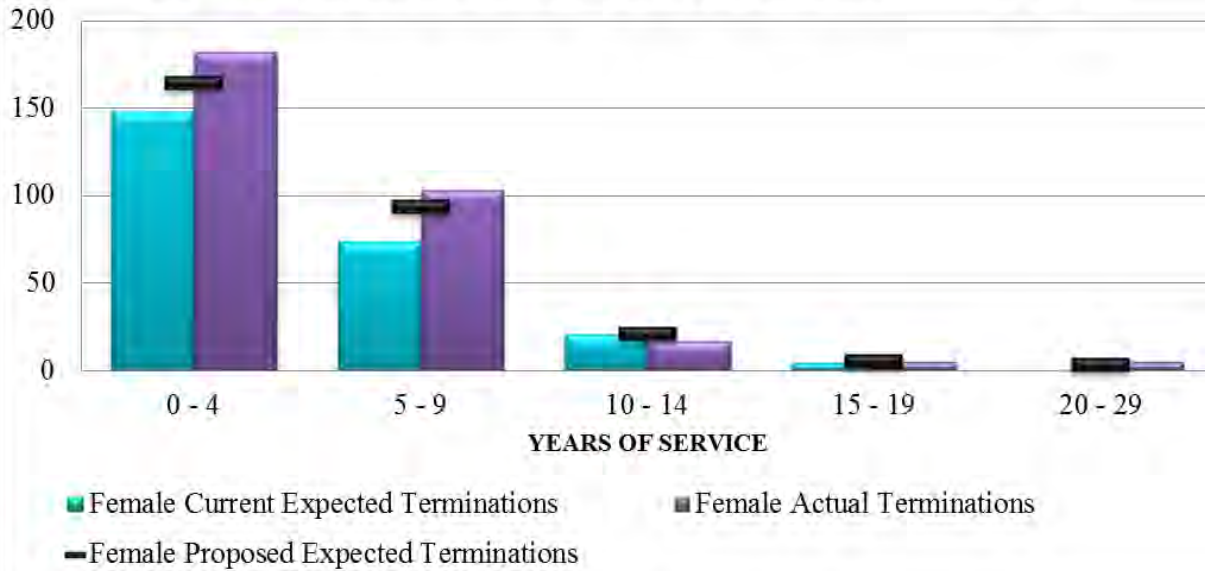
We analyzed the experience and recommend continuing the practice of applying separate rates for the first five years of service, and then applying age-based rates after that. Termination rates are not applied once a member is eligible for service retirement.

Over the past six years we have found that the termination rates for Miscellaneous females have been somewhat higher than males, so we have proposed increased termination rates for females with less than ten years of service. We have also proposed extending the age-based termination rates for Miscellaneous members that apply to members with 10 to 19 years of service to those with 20 to 29 years of service, as there have been a few terminations at those service levels. We have proposed no changes to the Safety termination rates, other than the addition of a very low rate of termination (0.1%) from ages 55 to 59 with 5 to 9 years of service.

The tables and charts below show the actual experience (over the past six years) compared to the current and recommended assumptions.



**Chart III-8: MCERA Miscellaneous Females
Comparison of Actual and Expected Terminations**



**Chart III-9: MCERA Safety
Comparison of Actual and Expected Terminations**

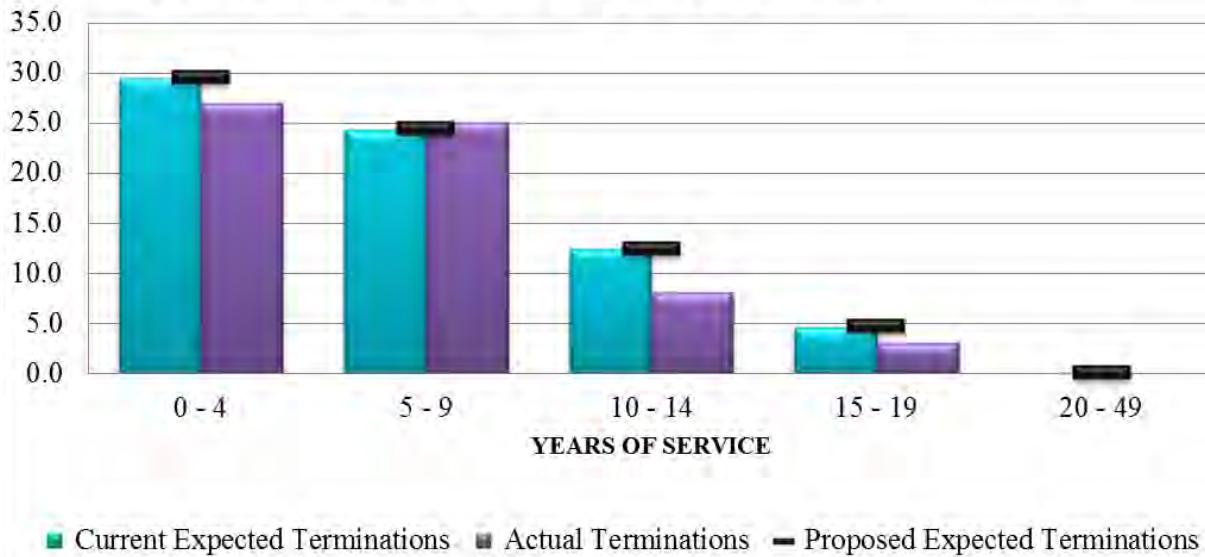


Table III-11: Termination Experience (2008-2014)

	Eligible Exposures	Actual Terminations	Actual Rates	Current Expected Terminations	Proposed Expected Terminations	Current A/E Ratio	Proposed A/E Ratio
Misc Male	3,202	149	4.65%	156.1	157.5	95.5%	94.6%
Misc Female	4,901	312	6.37%	246.6	284.9	126.5%	109.5%
Misc Combined	8,103	461	5.69%	402.7	442.4	114.5%	104.2%
Safety	2,599	69	2.65%	70.9	70.9	97.3%	97.3%
<u>Average Termination Age</u>							
			Actual	Current Expected	Proposed Expected		
Misc Male			46.4	41.7	42.0		
Misc Female			43.4	41.5	42.2		
Misc Combined			44.4	41.6	42.1		
Safety			37.0	35.1	35.1		

Tables III-12, III-13, and III-14 provide the details on the current and proposed assumptions at sample ages.

Table III-12

Current and Proposed Termination Rates (less than five years of service)

Service	Miscellaneous			Safety
	Male	Female Current	Female Proposed	
0	15.00%	15.00%	15.00%	8.00%
1	9.00%	9.00%	10.00%	5.00%
2	7.00%	7.00%	8.00%	4.00%
3	7.00%	7.00%	8.00%	4.00%
4	7.00%	7.00%	8.00%	4.00%

Table III-13**Current and Proposed Miscellaneous Termination Rates (five or more years of service)**

Age	Current (Unisex)			Proposed					
	5-9 Years of Service	10-14 Years of Service	15-19 Years of Service	Males			Females		
				5-9 Years of Service	10-14 Years of Service	15-29 Years of Service	5-9 Years of Service	10-14 Years of Service	15-29 Years of Service
20	7.95%	5.30%	3.00%	7.00%	5.30%	3.00%	7.75%	5.30%	3.00%
25	7.95%	5.30%	3.00%	7.00%	5.30%	3.00%	7.75%	5.30%	3.00%
30	7.95%	5.30%	3.00%	7.00%	5.30%	3.00%	7.75%	5.30%	3.00%
35	6.75%	4.50%	2.50%	6.75%	4.50%	2.50%	7.75%	4.50%	2.50%
40	4.80%	3.20%	2.00%	4.80%	3.20%	2.00%	5.80%	3.20%	2.00%
45	3.75%	2.50%	1.70%	3.75%	2.50%	1.70%	4.75%	2.50%	1.70%
50	2.10%	0.00%	0.00%	2.10%	0.00%	0.00%	3.10%	0.00%	0.00%
55	1.20%	0.00%	0.00%	1.20%	0.00%	0.00%	2.20%	0.00%	0.00%
60	1.20%	0.00%	0.00%	1.20%	0.00%	0.00%	2.20%	0.00%	0.00%

Table III-14**Current and Proposed Safety Termination Rates (five or more years of service)**

Age	Current	Proposed
	5-19 Years of Service	5-19 Years of Service
20	2.06%	2.06%
25	2.24%	2.24%
30	3.53%	3.53%
35	3.41%	3.41%
40	1.14%	1.14%
45	1.70%	1.70%
50	0.27%	0.27%
55	0.00%	0.10%
60	0.00%	0.00%

REFUND RATES AND RECIPROCITY

When a vested member terminates employment, they have the option of receiving a refund of contributions with interest or a deferred annuity. If an employee terminates employment and works for a reciprocal employer, the employee’s retirement benefit is ultimately based on the employee’s service with MCERA and Final Compensation based on employment with any reciprocal employer.

Tables III-15 and III-16 on the next page show the results of our analysis of withdrawals for Miscellaneous and Safety, for the combined period from 2008-2014. We are recommending the rates of withdrawal for vested Miscellaneous members be reduced from 40% to 30% for less than five years of service, and reduced from 25% to 15% for those with more than five years of service. We recommend maintaining the assumption that 25% of Safety members with less than 10 years of service will withdraw their contributions, and adding an assumption that 5% of those with more than 10 years of service will withdraw (previously all were assumed to leave their contributions in the system).

The current assumption is that 25% of Miscellaneous and 40% of Safety non-withdrawal terminating employees work for reciprocal employers and receive salary increases equal to the payroll growth assumption. We propose maintaining this reciprocity assumption for Safety, but reducing the percentage slightly (to 20%) for Miscellaneous.

**Table III-15
Analysis of Refund and Reciprocity Rates - Miscellaneous**

	Withdrawals as % of Terminations		Transfers as a % of Non-Withdrawals
	<5 Years of Service	5+ Years of Service	
Actual Experience			
Misc Male	30.95%	10.61%	23.97%
Misc Female	31.28%	18.64%	12.50%
Misc Combined	31.18%	15.76%	16.10%
Assumption			
Current	40.00%	25.00%	25.00%
Recommended	30.00%	15.00%	20.00%

Table III-16
Analysis of Refund and Reciprocity Rates - Safety

	Withdrawals as % of Terminations		Transfers as a % of Non-Withdrawals
	<10 Years of Service	10+ Years of Service	
Actual Experience			
Safety Combined	30.77%	7.69%	35.42%
Assumption			
Current	25.00%	0.00%	40.00%
Recommended	25.00%	5.00%	40.00%

FAMILY COMPOSITION

Members who are married at the time of retirement are entitled to an unreduced 60% joint and survivor annuity. An analysis of members who retired in the last six years and elected an unmodified form of benefit showed that 73.4% of males and 51.3% of females had spouses or domestic partners eligible to receive the subsidized survivor’s benefit. The current assumption is that 70% of male and 50% of female service retirees and disabilities have an eligible spouse; we recommend maintaining these assumptions.

An analysis of these same retired members showed that males are 3.5 years older than their spouses and female members are 1.4 years younger than their spouses. The current assumption is that all males are three years older than their spouses. We recommend decreasing the assumption for female members to assume that they are one year younger than their spouse and maintaining the current assumption for male members.

TERMINAL SERVICE AND PAY LOADS

A load is currently applied to the projected benefits for active members, to account for anticipated conversions of sick leave, end-of-career service purchases, or other terminal earnings to retirement service credit or final compensation.

We reviewed the information of 226 retirement calculations over the past six years for whom we had complete data. We compared the amount of service used in the member’s actual benefit calculation with the amount from the most recent actuarial valuation prior to retirement (projected to the member’s actual termination date). We computed the average unexpected increase in service for each member, adjusting for the fact that employees would have contributed their share of the normal cost for some types of service increases (i.e. service purchases and contribution redeposits for prior service).

Table III-17 shows the results of our analysis. We recommend increasing the load for County members from 1.0% to 1.2%. We also recommend introducing a load for Courts and other Special Districts of 1.2%. Although the recent data for the Special Districts indicated a higher average service increase than we have recommended (2.18%), this only represented three retirement calculations. We recommend increasing the load for San Rafael to 2.5%, representing a blending of the prior assumption and the recent experience.

Table III-17

Analysis of Terminal Service Loads

Group	Current Load	# of Calcs	Average Service Load	Recommended Load
County	1.00%	171	1.30%	1.20%
Courts	0.00%	13	1.42%	1.20%
Other Special Districts	0.00%	3	2.18%	1.20%
Novato Fire	3.00%	5	1.20%	3.00%
San Rafael	2.20%	34	2.74%	2.50%

For Novato Fire, members are also eligible to cash out vacation pay earned and payable in their final service period, and may therefore have an additional increase in pensionable compensation not necessarily reflected in their most recent valuation data. MCERA is in the process of reviewing recent retirement calculations for Novato to determine the effect of vacation and other cashouts. As a result, we recommend continuing the 3.0% load applied to Novato members until the analysis has been completed.

METHODOLOGY

PURPOSES OF THE EXPERIENCE STUDY

The first goal of this Experience Study is to review the recent past demographic experience of the Plan. We seek to understand the behavior of the participating members so that we can recommend actuarial assumptions concerning future demographic experience.

The second goal of this Study is to recommend economic assumptions to be used in computing liabilities and costs. These economic assumptions include the expected rate of return on Plan assets and the anticipated rate of increase in the Consumer Price Index (CPI). These assumptions are determined based on the investment strategy adopted by the Plan and on the past behavior of the capital markets and the CPI, and on future expectations.

Once adopted, the assumptions recommended by this Study will be used to determine future liabilities and costs and for purposes of evaluating prospective changes in benefits, eligibility conditions, and other aspects of the Plan's operations.

SCOPE OF REPORT

Demographic assumptions relate to all behavioral characteristics of the group. Behavioral characteristics do not include the assumptions concerning future inflation, the real rates of return of the investments in the trust fund, or the anticipated growth in the underlying payroll of the members.

Demographic assumptions include the following:

- Probability of retirement from active service,
- Probability of termination of employment prior to retirement (with the member receiving a deferred vested benefit or receiving a contribution refund),
- Probability of disability among active employees (either ordinary or duty related),
- Probability of deferred vested members working for a reciprocal employer,
- Family composition, and
- Rates of mortality among active, retired, disabled members and their beneficiaries.

In addition, demographic assumptions include the merit (longevity and promotion) component of individual pay increases. This does not include the inflationary element in pay increases. For example, if inflation is 3.2% and the employee receives a 4.7% pay increase, 1.5% of this increase is deemed "merit".

Economic assumptions include the rate of increase in the cost of living (inflation), which is a part of the overall pay increase assumption discussed above. In addition, a crucial economic assumption is the real rate of return on plan assets -- the return on assets above the rate of inflation.

IMPORTANCE OF RELIABLE ASSUMPTIONS

The liabilities and costs calculated in actuarial valuations and cost studies are based on a projection of future conditions. The actuary makes assumptions concerning the rates of retirement, withdrawal, termination, disability, and death among plan members. In addition, the actuary must project future earnings on plan assets, inflation, and growth in the pay of active members.

The actuary sets his or her assumptions based on past experience and future expectations. In setting demographic assumptions, such as rates of retirement, the past experience of the covered group of employees is often the best predictor of future behavior. When establishing economic assumptions, such as the expected return on plan assets, the historical behavior of the investment markets can serve as a guide.

Actuarial funding methods are designed so that, if the actuarial assumptions are met, plan costs will generally be a predictable percentage of member pay from year to year. If actual economic or demographic experience varies from our assumptions, plan costs will rise or fall accordingly. Therefore, it is worth the effort to make our best estimate of future conditions so that the plan costs computed by the actuary will be as stable and predictable as possible.

METHODOLOGY (ECONOMIC ASSUMPTIONS)

The Plan's economic assumptions are critically important in computing actuarial liabilities and costs. A careful determination of these assumptions requires an analysis of the past performance of the capital markets and the Plan's future investment outlook.

To this end, we proceed as follows:

- Based on a detailed analysis of recent past history and reasonable expectations for the future, a long term projection of the rate of inflation is determined.
- Based on the Plan's investment strategy and rates of return on various asset classes (provided by the investment consultant) the long term *real* rate of return on assets is simulated. This is the return on assets in excess of inflation.
- The projected rate of inflation is combined with the assumption concerning merit pay increases to project future members' pay.
- The rate of inflation is combined with the estimated real return on assets to determine the overall return on assets.

Any estimate of future inflation and asset returns is difficult. Over time, there will be actuarial gains and losses as experience deviates from our assumptions. As past and recent capital market experience has shown, these gains and losses can have a substantial impact on cost volatility.

METHODOLOGY (DEMOGRAPHIC ASSUMPTIONS)

One goal of this study is to compute the probability of death, disability, retirement, withdrawal, or termination leading to a vested benefit at each age for active members and the probability of death at each age for inactive members.

To this end, we proceed as follows:

- We count the number of members leaving for each cause during the term of the study. This is the number of decrements.
- We count the number of members who could have left for each cause during the study. This is the exposure.
- When the exposure is sufficient, we divide the number of decrements by the exposure at each combination of age and service for an employee group to determine the probability of leaving due to the cause in question.
- Where feasible, experience has been examined separately by gender. In some cases, experience has been combined when male and female experience is similar or when there is insufficient data to produce reliable rates by sex.

A unique challenge is presented by members who are on Active Leave as of the date of each annual valuation. These members have an uncertain status each year, since some will have applications for retirement or disability that are pending. For purposes of this study, these members are included in the total exposures and are recognized as a decrement based on the final resolution of their status when their applications for disability or retirement have been fully adjudicated.

When there is insufficient exposure to derive statistically reliable rates by age and service, we may combine exposures and decrements for groups of ages and service. Alternatively, we may compare the total number of actual decrements with the total number of decrements predicted by a standard actuarial table, and adopt a table that predicts decrements, in total, reasonably close to those that have been observed.

Where the rate of decrement is low and the underlying causes of the decrement in question are not expected to change significantly with time we may combine the most recent experience with data from prior experience studies.

For the study of the merit (longevity and promotion) components of individual pay increases, we generally choose to use a *transverse* study. A reliable way to assess average increases in pay due to merit is to analyze 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 is clearly visible in this analysis. This is a transverse study of longevity and promotion pay increases: The data is taken as of a particular point in time.

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, collective bargaining, and management decisions during the term of the study.