# Terminated Agency Risk Pool
# Actuarial Valuation
***As of June 30, 2021***


CalPERS

# Table of Contents

# Actuarial Certification

September 2022

To the best of our knowledge, this report is complete and accurate and contains sufficient information to disclose, fully and fairly, the funded condition of the Terminated Agency Risk Pool. This valuation is based on the member and financial data as of June 30, 2021 provided by the various CalPERS databases and the benefits under this risk pool with CalPERS as of the date this report was produced. It is our opinion that the valuation has been performed in accordance with generally accepted actuarial principles, in accordance with standards of practice prescribed by the Actuarial Standards Board, and that the assumptions and methods are internally consistent and reasonable for this risk pool, as prescribed by the CalPERS Board of Administration according to provisions set forth in the California Public Employees' Retirement Law.

The undersigned are actuaries for CalPERS. All are members of the American Academy of Actuaries and the Society of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Julian Robinson, FSA, EA, MAAA
*Senior Pension Actuary, CalPERS*

KERRY J. WORGAN, MAAA, FSA, FCIA
Supervising Pension Actuary, CalPERS

Scott Terando, ASA, EA, MAAA, FCA, CFA
*Chief Actuary, CalPERS*

# Highlights and Executive Summary

# Highlights and Executive Summary

## Introduction

This is the actuarial valuation report as of June 30, 2021 for the Terminated Agency Risk Pool. The Terminated Agency Risk Pool provides benefit payments to members and their beneficiaries who were employees of public agencies that have terminated their contract with CalPERS. This report shows that the Terminated Agency Risk Pool continues to be well funded as of June 30, 2021.

## Purpose of Report

This Actuarial Valuation for the Terminated Agency Risk Pool (TAP) of the California Public Employees' Retirement System (CalPERS) was performed by CalPERS' staff actuaries using data as of June 30, 2021. The purpose of the report is to:

- Set forth the funded status of this risk pool as of June 30, 2021
- Provide actuarial information as of June 30, 2021 to the CalPERS Board (and other interested parties

Use of this report for other purposes may be inappropriate.

### Actuarial Standards of Practice and California Actuarial Advisory Panel Recommendations

The report includes risk disclosures consistent with the Actuarial Standards of Practice No. 51 and satisfies all relevant basic disclosure requirements under the Model Disclosure Elements for Actuarial Valuation Reports recommended by the California Actuarial Advisory Panel. Risk disclosures include "Sensitivity Analysis" on the inflation rate and mortality rates.

As the terminated agencies do not pay contributions to the pool, the basic disclosure requirements related to contributions are not relevant.

## Funded Status of the Risk Pool

| | June 30, 2020 | June 30, 2021 |
|---|---|---|
| 1) Present Value of Projected Benefits | | |
| a) Active Members | $0 | $0 |
| b) Transferred Members | 35,141,332 | 33,842,610 |
| c) Terminated Members | 31,563,567 | 25,412,614 |
| d) Members and Beneficiaries Receiving Benefits | 141,089,291 | 137,197,461 |
| e) Total | $207,794,190 | $196,452,685 |
| 2) Market Value of Assets (MVA) | $366,127,374 | $390,862,083 |
| **3) Unfunded Liability/(Surplus) [(1e) - (2)]** | **($158,333,184)** | **($194,409,398)** |
| **4) Funded Ratio [(2) / (1e)]** | **176.2%** | **199.0%** |

## Changes Since the Prior Year's Valuation

This report reflects a change in both the discount rate and inflation assumption. The discount rate changed from 1.48% to 2.11%, while the inflation assumption changed from 1.65% to 2.33%.

These assumptions change each year as the yields on the underlying US Treasury securities fluctuate each year. See Appendix A for details on how these assumptions are set.

On November 17, 2021, the board adopted new actuarial assumptions based on the recommendations in the 2021 CalPERS Experience Study and Review of Actuarial Assumptions. This study reviewed the retirement rates, termination rates, mortality rates, rate of salary increases, and inflation assumptions for Public Agencies. These new assumptions are incorporated in this actuarial valuation. In addition, the board adopted a new asset portfolio as part of its Asset Liability Management process.

One terminated agency was added to the TAP in the June 30, 2021 valuation:

- Oroville Mosquito Abatement District

The total liabilities and assets associated with this termination are both approximately $0.6 million.

# Highlights and Executive Summary

## Subsequent Events

This report reflects events impacting the Terminated Agency Pool through June 30, 2021.

There were three agencies that terminated in FY 2021-22.

- Intelecom Intelligent Telecommunications
- Downey Cemetery District
- City of Paramount

The total liabilities and assets associated with these terminations are both approximately $18 million.

This will be reflected in the June 30, 2022 valuation report.

# Assets

# Assets

## Reconciliation of the Market Value of Assets

| | |
|---|---|
| 1) Market Value of Assets as of June 30, 2020 Including Receivables | $366,127,374 |
| 2) Change in Receivables for Service Buybacks as of June 30, 2020 | (1,036) |
| 3) Benefit Payments to Retirees and Beneficiaries | (7,467,439) |
| 4) Refunds | (63,302) |
| 5) Lump Sum Payments | - |
| 6) Transfers and Miscellaneous Adjustments | (336,641) |
| 7) Investment Return | 32,398,118 |
| 8) Market Value of Assets as of June 30, 2021 (w/o Pool Transfers) [(1) + (2) + (3) + (4) + (5) + (6) + (7)] | 390,657,075 |
| 9) Net Transfers into and out of the Risk Pool | 205,008 |
| **10) Market Value of Assets as of June 30, 2021 Including Receivables [(8) + (9)]** | **$390,862,083** |

## Asset Allocation

CalPERS Board has adopted an investment strategy for the Terminated Agency Risk Pool with the objective of minimizing funding risk and immunizing projected future benefit payments.

The assets of the Pool are invested as two independent segments:

- The Immunized Segment is invested in a blend of US Treasury Separate Trading of Registered Interest and Principal of Securities (STRIPS), US Treasury Inflation Protected Securities (TIPS) and cash or cash equivalents.
- The Non-immunized Segment is invested in the Public Employees' Retirement Fund (PERF).

The assets in the Immunized Segment are rebalanced annually to reflect new agencies entering the pool and updated future benefits projections. The rebalancing exercise is normally executed in the February/March period.

This strategy is designed to minimize underfunding risk, and balance other risks including reinvestment risk, inflation risk, and implementation risk. In addition, a higher return is expected to be generated from the Non-immunized Segment that is invested in the PERF. The table below shows the allocation of each segment for the current and previous valuation.

| | June 30, 2020 Allocation | $Millions | June 30, 2021 Allocation | $Millions |
|---|---|---|---|---|
| Immunized Segment | 51.5% | 188.5 | 51.7% | 202.1 |
| Non-immunized Segment | 48.5% | 177.6 | 48.3% | 188.7 |
| **Total** | **100.0%** | **$366.1** | **100.0%** | **$390.8** |

## Asset Returns

The rate of return by segment for the following periods:

| Asset Type | FY 2019-20 | FY 2020-21 |
|---|---|---|
| Immunized Segment | 16.1% | 1.6% |
| Non-immunized Segment | 4.7% | 21.3% |
| **Total** | **10.7%** | **8.9%** |

# Liabilities

# Liabilities

## Development of Accrued and Unfunded Liabilities

The following table shows the development of the accrued liabilities and the unfunded liabilities.

| | June 30, 2020 | June 30, 2021 |
|---|---|---|
| 1) Present Value of Benefits | | |
| a) Active Members | $0 | $0 |
| b) Transferred Members | 35,141,332 | 33,842,610 |
| c) Terminated Members | 31,563,567 | 25,412,614 |
| d) Members and Beneficiaries Receiving Payments | 141,089,291 | 137,197,461 |
| **e) Total** | 207,794,190 | 196,452,685 |
| | | |
| 2) Present Value of Future Employer Normal Costs | 0 | 0 |
| 3) Present Value of Future Employee Contributions | 0 | 0 |
| | | |
| 4) Accrued Liability | | |
| a) Active Members | $0 | $0 |
| b) Transferred Members | 35,141,332 | 33,842,610 |
| c) Terminated Members | 31,563,567 | 25,412,614 |
| d) Members and Beneficiaries Receiving Payments | 141,089,291 | 137,197,461 |
| e) Total | 207,794,190 | 196,452,685 |
| | | |
| 5) Market Value of Assets (MVA) | $366,127,374 | $390,862,083 |
| **6) Unfunded Liability/(Surplus) [(4e) – (5)]** | **($158,333,184)** | **($194,409,398)** |
| **7) Funded Status [(5) / (4e)]** | **176.2%** | **199.0%** |

# Liabilities

## (Gain)/Loss Analysis

To calculate the cost requirements of the plan, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year, actual experience is compared to the expected experience based on the actuarial assumptions. This results in actuarial gains or losses, as shown below.

| | |
|---|---|
| **1) Liability (Gain)/Loss for the Year** | |
| a) Accrued Liability at 6/30/2020 | $207,794,190 |
| b) Benefit Payments to Retirees & Beneficiaries | (7,467,439) |
| c) Refunds | (63,302) |
| d) Interest[1] | 3,015,750 |
| e) Expected Accrued Liability at 6/30/2021[(1a) + (1b) + (1c) + (1d)] | 203,279,200 |
| f) Effect of Data Changes | - |
| g) Effect of Method Changes | - |
| h) Effect of New Entrants to the Pool | 623,701 |
| i) Changes due to Assumption Changes | (6,924,530) |
| j) Actual Accrued Liability at 6/30/2021 | $196,452,685 |
| **k) Liability (Gain)/Loss [(1j)-(1i)-(1h)-(1g)-(1f)-(1e)]** | **($525,685)** |
| **2) Asset (Gain)/Loss for the Year** | |
| a) Market Value of Assets as of 6/30/2020 Including Receivables | $366,127,374 |
| b) Changes in Receivables for Service Buybacks as of 6/30/2020 | (1,036) |
| c) Benefit Payments to Retirees & Beneficiaries | (7,467,439) |
| d) Refunds | (63,302) |
| e) Lump Sum Payments | |
| f) Transfers and Miscellaneous Adjustments | (336,641) |
| g) Net Transfers into and out of the Risk Pool | 205,008 |
| h) Expected Interest[2] | 13,519,856 |
| i) Expected Assets at 6/30/2021 [(2a) + (2b) + (2c) + (2d) + (2e) + (2f) + (2g) + (2h)] | $371,983,821 |
| j) Market Value of Assets as of 6/30/2021 Including Receivables | $390,862,083 |
| **k) Asset (Gain)/Loss [(2i) – (2j)]** | **($18,878,262)** |
| **3) Liability (Gain)/Loss for the Year** | |
| a) Liability (Gain)/Loss(1k) | ($525,685) |
| b) Asset (Gain)/Loss (2k) | ($18,878,262) |
| **c) Total (Gain)/Loss [(3a) + (3b)]** | **($19,403,947)** |

[1]Expected interest on Liabilities 1.48%.

[2]Expected interest on Assets 3.73%. This is based on a blend of the expected return on the two segments of the TAP Portfolio:

Immunized Segment at 2.32%

Non-immunized Segment at 7.00%

# Liabilities

## Funding History

| Valuation Date | Accrued Liability | Market Value of Asset (MVA) | Unfunded Liability / (Surplus) | Funded Ratio |
|---|---|---|---|---|
| 06/30/10 | 55,014,174 | 154,562,757 | (99,548,583) | 281.0% |
| 06/30/11 | 70,524,343 | 184,380,119 | (113,855,776) | 261.4% |
| 06/30/12 | 84,521,429 | 178,657,676 | (94,136,247) | 211.4% |
| 06/30/13 | 78,123,425 | 194,227,188 | (116,103,763) | 248.6% |
| 06/30/14 | 82,254,488 | 215,414,591 | (133,160,103) | 261.9% |
| 06/30/15 | 88,473,668 | 219,694,509 | (131,220,841) | 248.3% |
| 06/30/16 | 117,360,281 | 250,137,428 | (132,777,147) | 213.1% |
| 06/30/17 | 139,904,430 | 281,900,545 | (141,996,115) | 201.5% |
| 06/30/18 | 145,065,798 | 286,352,337 | (141,286,539) | 197.4% |
| 06/30/19 | 148,706,861 | 301,503,348 | (152,796,487) | 202.8% |
| 06/30/20 | 207,794,190 | 366,127,374 | (158,333,184) | 176.2% |
| 06/30/21 | 196,452,685 | 390,862,083 | (194,409,398) | 199.0% |

## History of Plans in the Terminated Agency Pool

| Valuation Date | Number of Plans in Pool | Number of Plans Joining Pool | Accrued Liability of Joining Plans ($ millions) | Number of Plans Leaving Pool |
|---|---|---|---|---|
| 06/30/10 | 87 | 0 | - | - |
| 06/30/11 | 87 | 3 | $1 | 3 |
| 06/30/12 | 90 | 3 | - | - |
| 06/30/13 | 90 | 2 | - | 2 |
| 06/30/14 | 94 | 4 | $8 | - |
| 06/30/15 | 93 | 2 | $3 | 3 |
| 06/30/16 | 98 | 5 | $24 | - |
| 06/30/17 | 108 | 10 | $28 | - |
| 06/30/18 | 109 | 1 | $1 | - |
| 06/30/19 | 109 | 5 | $1 | 5 |
| 06/30/20 | 119 | 10 | $38 | - |
| 06/30/21 | 119 | 1 | $1 | 1 |

# Risk Analysis

# Risk Analysis

## Analysis of Mortality Rate Sensitivity

The following analysis looks at the change in the June 30, 2021 funded ratio under two different mortality rate scenarios. Shown below are the funded ratios assuming mortality rates that are 10% lower and 10% higher than the current valuation mortality rate assumptions. This analysis gives an indication of the sensitivity of the funded ratio of the Terminated Agency Risk Pool to increasing or decreasing mortality rates over the long-term.

This type of analysis gives the reader a sense of the long-term risk to the risk pool's funded ratio.

**Mortality Rate Sensitivity as of June 30, 2021**

| | | Current Mortality Rates $Millions | -10% Mortality Rates $Millions | +10% Mortality Rate $Millions |
|---|---|---|---|---|
| a) | Accrued Liability | 196,452,685 | 203,660,707 | 190,048,400 |
| b) | Market Value of Assets | 390,862,083 | 390,862,083 | 390,862,083 |
| c) | Unfunded Liability(Surplus) [(a)-(b)] | (194,409,398) | (187,201,376) | (200,813,683) |
| d) | Funded Ratio | 199.0% | 191.9% | 205.7% |

A 10% increase (decrease) to the assumed mortality rates over the long-term would result in approximately a 7% increase (decrease) to the funded ratio.

## Analysis of Inflation Rate Sensitivity

The following analysis looks at the change in the June 30, 2021 funded ratio under two different inflation rate scenarios. Shown below are the funded ratios assuming inflation rates that are 1% lower and 1% higher than the current valuation inflation rate assumption (2.33%). This analysis gives an indication of the sensitivity of the funded ratio of the Terminated Agency Risk Pool to increasing or decreasing inflation rates over the long-term.

**Inflation Rate Sensitivity as of June 30, 2021**

| | | Current Inflation Rate $Millions | -1% Inflation Rate $Millions | +1% Inflation Rate $Millions |
|---|---|---|---|---|
| a) | Accrued Liability | 196,452,685 | 177,924,055 | 207,643,210 |
| b) | Market Value of Assets | 390,862,083 | 390,862,083 | 390,862,083 |
| c) | Unfunded Liability(Surplus) [(a)-(b)] | (194,409,398) | (212,938,028) | (183,218,873) |
| d) | Funded Ratio | 199.0% | 219.7% | 188.2% |

A decrease of 1% in the inflation rate assumption (2.33% to 1.33%) reduces the Accrued Liability by 9.4%. However, a 1% increase in the inflation rate (2.33% to 3.33%) increases the Accrued Liability by 5.7%. Unlike the mortality sensitivity analysis above, the impact of the inflation rate sensitivity is not symmetrical. The reason for this is most plans in the TAP have a 2% COLA provision, which limits annual increases to 2%.

## Discount Rate Sensitivity

The Terminated Agency Pool's funded ratio is not expected to be sensitive to changes in interest rates due to the Immunized Segment of the pool's market value of assets. Immunization of a significant portion of the risk pool's portfolio results in a funded status that is invariant to changes in the interest rate. Since the funded ratio is not expected to be sensitive to the discount rate for this risk pool, the most sensitive assumptions are the mortality rate and inflation rate assumptions. Consequently, a discount rate sensitivity analysis was replaced with a mortality rate and inflation rate sensitivity analysis for this risk pool.

# Appendices

# Appendix A – Actuarial Methods and Assumptions

## Actuarial Data

As stated in the Actuarial Certification, the data, which serve as the basis of this valuation, have been obtained from the various CalPERS databases. We have reviewed the valuation data and believe that it is reasonable and appropriate in aggregate. We are unaware of any potential data issues that would have a material effect on the results of this valuation, except that data do not always contain the latest salary information for former members now in reciprocal systems and does not recognize the potential for usually large salary deviation in certain cases such as elected officials. Therefore, salary information in these cases may not be accurate. These situations are relatively infrequent.

## Actuarial Methods

The actuarial accrued liability for members currently receiving benefits and for members entitled to deferred benefits (i.e., transferred members and separated members) is equal to the present value of the benefits expected to be paid.

As there are no contributions or amortization requirements for the Terminated Agency Pool, there is no need to dampen fluctuations in the Market Value of Assets to derive an Actuarial Value of Assets. Therefore, the Actuarial Value of Assets has been set equal to the Market Value of Assets.

The excess of the actuarial accrued liability over the market value of plan assets is called the unfunded actuarial accrued liability.

## Actuarial Assumptions

## Economic Assumptions

### Discount Rate

The discount rate for this valuation is 2.11% compounded annually (net of expenses) which is the yield on 30 Year US Treasury STRIPS as of June 30, 2021. This rate is used for all plans in this valuation. A discount rate of 1.48% was used in the prior year's valuation.

The following procedure is used to determine the discount rate for terminated agency valuations:

a) Determine the duration of the pension liabilities as of the valuation date
b) Determine the weights that should be applied to the 10 Year and 30 Year US Treasury durations (at spot rates at the valuation date), to equal the duration calculated in (a)
c) Apply the weights determined in (b) to the 10 Year and 30 Year US Treasury yields.

# Appendix A - Actuarial Methods and Assumptions

## Economic Assumptions (continued)

Salary Growth

Annual increases vary by category, entry age, and duration of service. A sample of assumed increases are shown below. Wage inflation assumption in the valuation year (2.80% for 2021) is added to these factors for total salary growth.

**Annual Percentage Increase**

Public Agency Miscellaneous

| | Entry Age | | |
|---|---|---|---|
| Duration of Service | 20 | 30 | 40 |
| 0 | 7.6% | 6.2% | 5.2% |
| 1 | 6.6% | 5.3% | 4.2% |
| 2 | 5.8% | 4.5% | 3.5% |
| 3 | 5.0% | 3.8% | 2.8% |
| 4 | 4.4% | 3.2% | 2.3% |
| 5 | 3.8% | 2.8% | 1.9% |
| 10 | 2.0% | 1.3% | 1.1% |
| 15 | 1.6% | 1.0% | 0.7% |
| 20 | 1.2% | 0.8% | 0.5% |
| 25 | 0.9% | 0.7% | 0.3% |
| 30 | 0.7% | 0.5% | 0.2% |

Public Agency Fire

| | Entry Age | | |
|---|---|---|---|
| Duration of Service | 20 | 30 | 40 |
| 0 | 15.2% | 15.5% | 6.3% |
| 1 | 11.9% | 11.4% | 5.2% |
| 2 | 9.4% | 8.4% | 4.2% |
| 3 | 7.4% | 6.1% | 3.5% |
| 4 | 5.8% | 4.5% | 2.8% |
| 5 | 4.5% | 3.3% | 2.3% |
| 10 | 1.9% | 1.4% | 0.8% |
| 15 | 1.7% | 1.2% | 0.9% |
| 20 | 1.5% | 1.1% | 1.0% |
| 25 | 1.3% | 0.9% | 1.2% |
| 30 | 1.1% | 0.8% | 1.3% |

Public Agency Police

| | Entry Age | | |
|---|---|---|---|
| Duration of Service | 20 | 30 | 40 |
| 0 | 11.8% | 10.5% | 6.5% |
| 1 | 9.3% | 8.1% | 5.3% |
| 2 | 7.4% | 6.3% | 4.3% |
| 3 | 5.8% | 4.9% | 3.5% |
| 4 | 4.6% | 3.8% | 2.9% |
| 5 | 3.7% | 2.9% | 2.4% |
| 10 | 1.9% | 1.6% | 1.2% |
| 15 | 1.8% | 1.5% | 1.3% |
| 20 | 1.8% | 1.5% | 1.5% |
| 25 | 1.8% | 1.4% | 1.6% |
| 30 | 1.8% | 1.4% | 1.8% |

# Appendix A - Actuarial Methods and Assumptions

**Salary Growth** (continued)

Public Agency County Peace Officer

| Duration of Service | Entry Age 20 | Entry Age 30 | Entry Age 40 |
|---|---|---|---|
| 0 | 12.4% | 10.5% | 8.9% |
| 1 | 9.4% | 8.1% | 6.7% |
| 2 | 7.2% | 6.2% | 5.1% |
| 3 | 5.4% | 4.7% | 3.9% |
| 4 | 4.1% | 3.6% | 2.9% |
| 5 | 3.1% | 2.8% | 2.2% |
| 10 | 1.8% | 1.4% | 0.7% |
| 15 | 1.7% | 1.2% | 0.7% |
| 20 | 1.6% | 1.1% | 0.7% |
| 25 | 1.6% | 0.9% | 0.8% |
| 30 | 1.5% | 0.8% | 0.8% |

- The Miscellaneous salary scale is used for Local Prosecutors.
- The Police salary scale is used for Other Safety, Local Sheriff, and School Police.

### Inflation

2.33% compounded annually. This assumption is used for all plans in the TAP. The inflation rate is determined as the difference between the yield on 30 Year US Treasury STRIPS and the yield on 30 Year US Treasury TIPS as of the valuation date. An inflation rate of 1.65% was used in the prior year's valuation.

### Non-valued Potential Additional Liabilities

The potential liability loss for a cost-of-living increase exceeding the 2.33% inflation assumption is not reflected in the valuation.

# Appendix A - Actuarial Methods and Assumptions

## Miscellaneous Loading Factors

### Credit for Unused Sick Leave

Final Average Salary is increased by 1% for those agencies that have accepted the provision providing Credit for Unused Sick Leave.

### Conversion of Employer Paid Member Contributions (EPMC)

Final Average Salary is increased by the Employee Contribution Rate for those agencies that have contracted for the provision providing for the Conversion of Employer Paid Member Contributions (EPMC) during the final compensation period.

### Norris Decision (Best Factors)

Employees hired prior to July 1, 1982 have projected benefit amounts increased in order to reflect the use of "Best Factors" for these employees in the calculation of optional benefit forms. This is due to a 1983 Supreme Court decision, known as the Norris decision, which required males and females to be treated equally in the determination of benefit amounts. Consequently, anyone already employed at that time is given the best possible conversion factor when optional benefits are determined. No loading is necessary for employees hired after July 1, 1982.

### Termination Liability

At the time an agency terminates, the termination process requires applying a contingency load for unforeseen improvements in mortality. For terminations before January 1, 2018, a 7% load for unforeseen negative experience was applied (as set by Board Resolution ACT-11-02 and approved by the Board on June 15, 2011). In December 2017, the Board approved the CalPERS Experience Study and Review of Actuarial Assumptions, changing the load to 5%.

## Demographic Assumptions

### Pre-Retirement Mortality

The mortality assumptions are based on mortality rates resulting from the most recent CalPERS Experience Study adopted by the CalPERS Board in November 2021. For purposes of the mortality rates, the rates incorporate generational mortality to capture on-going mortality improvement. Generational mortality explicitly assumes that members born more recently will live longer than the members born before them thereby capturing the mortality improvement seen in the past and expected continued improvement. For more details, please refer to the 2021 experience study report that can be found on the CalPERS website

Rates vary by age and gender are shown in the table below. This table only contains a sample of the 2017 base table rates for illustrative purposes. The non-industrial death rates are used for all plans. The industrial death rates are used for Safety plans (except for local Safety members described in Section 20423.6 where the agency has not specifically contracted for industrial death benefits.)

| | Miscellaneous | | Safety | | | |
|---|---|---|---|---|---|---|
| | Non-Industrial Death (Not Job-Related) | | Non-Industrial Death (Not Job-Related) | | Industrial Death (Job-Related) | |
| Age | Male | Female | Male | Female | Male | Female |
| 20 | 0.00039 | 0.00014 | 0.00038 | 0.00014 | 0.00004 | 0.00002 |
| 25 | 0.00033 | 0.00013 | 0.00034 | 0.00018 | 0.00004 | 0.00002 |
| 30 | 0.00044 | 0.00019 | 0.00042 | 0.00025 | 0.00005 | 0.00003 |
| 35 | 0.00058 | 0.00029 | 0.00048 | 0.00034 | 0.00005 | 0.00004 |
| 40 | 0.00075 | 0.00039 | 0.00055 | 0.00042 | 0.00006 | 0.00005 |
| 45 | 0.00093 | 0.00054 | 0.00066 | 0.00053 | 0.00007 | 0.00006 |
| 50 | 0.00134 | 0.00081 | 0.00092 | 0.00073 | 0.00010 | 0.00008 |
| 55 | 0.00198 | 0.00123 | 0.00138 | 0.00106 | 0.00015 | 0.00012 |
| 60 | 0.00287 | 0.00179 | 0.00221 | 0.00151 | 0.00025 | 0.00017 |
| 65 | 0.00403 | 0.00250 | 0.00346 | 0.00194 | 0.00038 | 0.00022 |
| 70 | 0.00594 | 0.00404 | 0.00606 | 0.00358 | 0.00067 | 0.00040 |
| 75 | 0.00933 | 0.00688 | 0.01099 | 0.00699 | 0.00122 | 0.00078 |
| 80 | 0.01515 | 0.01149 | 0.02027 | 0.01410 | 0.00225 | 0.00157 |

# Appendix A - Actuarial Methods and Assumptions

- The pre-retirement mortality rates above are for 2017 and are projected generationally for future years using 80% of the Society of Actuaries' Scale MP-2020.
- Miscellaneous plans usually have industrial death rates set to zero unless the agency has specifically contracted for industrial death benefits. If so, each non-industrial death rate shown above will be split into two components: 99% will become the non-industrial death rate and 1% will become the industrial death rate.

### Post-Retirement Mortality

Rates vary by age, type of retirement, and gender. See sample rates in table below. These rates are used for all plans.

| | Healthy Recipients | | Non-Industrial Disabled (Not Job-Related) | | Industrial Disabled (Job-Related) | |
|---|---|---|---|---|---|---|
| Age | Male | Female | Male | Female | Male | Female |
| 50 | 0.00267 | 0.00199 | 0.01701 | 0.01439 | 0.00430 | 0.00311 |
| 55 | 0.00390 | 0.00325 | 0.02210 | 0.01734 | 0.00621 | 0.00550 |
| 60 | 0.00578 | 0.00455 | 0.02708 | 0.01962 | 0.00944 | 0.00868 |
| 65 | 0.00857 | 0.00612 | 0.03334 | 0.02276 | 0.01394 | 0.01190 |
| 70 | 0.01333 | 0.00996 | 0.04001 | 0.02910 | 0.02163 | 0.01858 |
| 75 | 0.02391 | 0.01783 | 0.05376 | 0.04160 | 0.03446 | 0.03134 |
| 80 | 0.04371 | 0.03403 | 0.07936 | 0.06112 | 0.05853 | 0.05183 |
| 85 | 0.08274 | 0.06166 | 0.11561 | 0.09385 | 0.10137 | 0.08045 |
| 90 | 0.14539 | 0.11086 | 0.16608 | 0.14396 | 0.16584 | 0.12434 |
| 95 | 0.24665 | 0.20364 | 0.24665 | 0.20364 | 0.24665 | 0.20364 |
| 100 | 0.36198 | 0.31582 | 0.36198 | 0.31582 | 0.36198 | 0.31582 |
| 105 | 0.52229 | 0.44679 | 0.52229 | 0.44679 | 0.52229 | 0.44679 |
| 110 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 |

The post-retirement mortality rates above are for 2017 and are projected generationally for future years using 80% of the Society of Actuaries' Scale MP-2020.

### Marital Status

For active members, a percentage married upon retirement is assumed according to the following table.

| Plan | Percent Married |
|---|---|
| Miscellaneous Member | 70% |
| Local Police | 85% |
| Local Fire | 85% |
| Other Local Safety | 70% |
| School Police | 85% |
| Local County Peace Officers | 75% |

### Age of Spouse

It is assumed that female spouses are 3 years younger than male spouses. This assumption is used for all plans in the TAP.

### Terminated Members

It is assumed that terminated members refund immediately if non-vested. Terminated members who are vested are assumed to retire at age 59 for Miscellaneous members and age 54 for Safety members.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

### Termination with Refund

Rates vary by entry age and years of service for Miscellaneous Plans. Rates vary by years of service for Safety Plans. See sample rates in tables below.

Public Agency Miscellaneous

| Duration of Service | Entry Age | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | 25 | | 30 | | 35 | | 40 | | 45 | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| 0 | 0.1851 | 0.1944 | 0.1769 | 0.1899 | 0.1631 | 0.1824 | 0.1493 | 0.1749 | 0.1490 | 0.1731 | 0.1487 | 0.1713 |
| 1 | 0.1531 | 0.1673 | 0.1432 | 0.1602 | 0.1266 | 0.1484 | 0.1101 | 0.1366 | 0.1069 | 0.1323 | 0.1037 | 0.1280 |
| 2 | 0.1218 | 0.1381 | 0.1125 | 0.1307 | 0.0970 | 0.1183 | 0.0815 | 0.1058 | 0.0771 | 0.0998 | 0.0726 | 0.0938 |
| 3 | 0.0927 | 0.1085 | 0.0852 | 0.1020 | 0.0727 | 0.0912 | 0.0601 | 0.0804 | 0.0556 | 0.0737 | 0.0511 | 0.0669 |
| 4 | 0.0672 | 0.0801 | 0.0616 | 0.0752 | 0.0524 | 0.0670 | 0.0431 | 0.0587 | 0.0392 | 0.0523 | 0.0352 | 0.0459 |
| 5 | 0.0463 | 0.0551 | 0.0423 | 0.0517 | 0.0358 | 0.0461 | 0.0292 | 0.0404 | 0.0261 | 0.0350 | 0.0230 | 0.0296 |
| 10 | 0.0112 | 0.0140 | 0.0101 | 0.0129 | 0.0083 | 0.0112 | 0.0064 | 0.0094 | 0.0048 | 0.0071 | 0.0033 | 0.0049 |
| 15 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 20 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 25 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 30 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 35 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Public Agency Safety

| Duration of Service | Fire | | Police* | | County Peace Officer | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| 0 | 0.1022 | 0.1317 | 0.1298 | 0.1389 | 0.1086 | 0.1284 |
| 1 | 0.0686 | 0.1007 | 0.0789 | 0.0904 | 0.0777 | 0.0998 |
| 2 | 0.0441 | 0.0743 | 0.0464 | 0.0566 | 0.0549 | 0.0759 |
| 3 | 0.0272 | 0.0524 | 0.0274 | 0.0343 | 0.0385 | 0.0562 |
| 4 | 0.0161 | 0.0349 | 0.0170 | 0.0206 | 0.0268 | 0.0402 |
| 5 | 0.0092 | 0.0214 | 0.0113 | 0.0128 | 0.0186 | 0.0276 |
| 10 | 0.0015 | 0.0000 | 0.0032 | 0.0047 | 0.0046 | 0.0038 |
| 15 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0023 | 0.0036 |
| 20 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 25 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 30 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 35 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

*The Police Termination and Refund rates are used for Public Agency Local Prosecutors, Other Safety, Local Sheriff, and School Police.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

**Termination with Vested Deferred Benefits**

Rates vary by entry age and years of service for Miscellaneous Plans. Rates vary by years of service for Safety Plans. See sample rates in tables below.

Public Agency Miscellaneous

| Duration of Service | Entry Age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | | 25 | | 30 | | 35 | | 40 | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| 5 | 0.0381 | 0.0524 | 0.0381 | 0.0524 | 0.0358 | 0.0464 | 0.0334 | 0.0405 | 0.0301 | 0.0380 |
| 10 | 0.0265 | 0.0362 | 0.0265 | 0.0362 | 0.0254 | 0.0334 | 0.0244 | 0.0307 | 0.0197 | 0.0236 |
| 15 | 0.0180 | 0.0252 | 0.0180 | 0.0252 | 0.0166 | 0.0213 | 0.0152 | 0.0174 | 0.0119 | 0.0132 |
| 20 | 0.0141 | 0.0175 | 0.0141 | 0.0175 | 0.0110 | 0.0131 | 0.0079 | 0.0087 | 0.0000 | 0.0000 |
| 25 | 0.0084 | 0.0108 | 0.0084 | 0.0108 | 0.0064 | 0.0076 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 30 | 0.0047 | 0.0056 | 0.0047 | 0.0056 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 35 | 0.0038 | 0.0041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Public Agency Safety

| Duration of Service | Fire | | Police* | | County Peace Officer | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| 5 | 0.0089 | 0.0224 | 0.0156 | 0.0272 | 0.0177 | 0.0266 |
| 10 | 0.0066 | 0.0164 | 0.0113 | 0.0198 | 0.0126 | 0.0189 |
| 15 | 0.0048 | 0.0120 | 0.0083 | 0.0144 | 0.0089 | 0.0134 |
| 20 | 0.0035 | 0.0088 | 0.0060 | 0.0105 | 0.0063 | 0.0095 |
| 25 | 0.0024 | 0.0061 | 0.0042 | 0.0073 | 0.0042 | 0.0063 |
| 30 | 0.0012 | 0.0031 | 0.0021 | 0.0037 | 0.0021 | 0.0031 |
| 35 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

When a member is eligible to retire, the termination with vested benefits probability is set to zero.

- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.
- The Police Termination with vested benefits rates are used for Public Agency Local Prosecutors, Other Safety, Local Sheriff, and School Police.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

### Non-Industrial (Not Job-Related) Disability

Rates vary by age and gender for Miscellaneous Plans.

Rates vary by age for Safety Plans

| | Miscellaneous | | Fire | Police | County Peace Officer |
|---|---|---|---|---|---|
| Age | Male | Female | Male and Female | Male and Female | Male and Female |
| 20 | 0.0001 | 0.0000 | 0.0001 | 0.0001 | 0.0001 |
| 25 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| 30 | 0.0002 | 0.0003 | 0.0001 | 0.0001 | 0.0001 |
| 35 | 0.0004 | 0.0007 | 0.0001 | 0.0002 | 0.0003 |
| 40 | 0.0009 | 0.0012 | 0.0001 | 0.0002 | 0.0006 |
| 45 | 0.0015 | 0.0019 | 0.0002 | 0.0003 | 0.0011 |
| 50 | 0.0015 | 0.0019 | 0.0004 | 0.0005 | 0.0016 |
| 55 | 0.0014 | 0.0013 | 0.0006 | 0.0007 | 0.0009 |
| 60 | 0.0012 | 0.0009 | 0.0006 | 0.0011 | 0.0005 |

- The Miscellaneous Non-Industrial Disability rates are used for Local Prosecutors.
- The Police Non-Industrial Disability rates are used for Other Safety, Local Sheriff, and School Police.

### Industrial (Job-Related) Disability

Rates vary by age and category.

| Age | Fire | Police | County Peace Officer |
|---|---|---|---|
| 20 | 0.0001 | 0.0000 | 0.0004 |
| 25 | 0.0002 | 0.0017 | 0.0013 |
| 30 | 0.0006 | 0.0048 | 0.0025 |
| 35 | 0.0012 | 0.0079 | 0.0037 |
| 40 | 0.0023 | 0.0110 | 0.0051 |
| 45 | 0.0040 | 0.0141 | 0.0067 |
| 50 | 0.0208 | 0.0185 | 0.0092 |
| 55 | 0.0307 | 0.0479 | 0.0151 |
| 60 | 0.0438 | 0.0602 | 0.0174 |

- The Police Industrial Disability rates are used for Local Sheriff and Other Safety.
- Fifty Percent of the Police Industrial Disability rates are used for School Police.
- One Percent of the Police Industrial Disability rates are used for Local Prosecutors.

Normally, rates are zero for Miscellaneous Plans unless the agency has specifically contracted for Industrial Disability benefits. If so, each Miscellaneous Non-Industrial Disability rate will be split into two components: 50% will become the Non-Industrial Disability rate and 50% will become the Industrial Disability rate.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

### Service Retirement

Retirement rates vary by age, years of service, and formula, except for the Safety ½ @ 55 and 2% @ 55 formulas, where retirement rates vary by age only.

Public Agency Miscellaneous 1.5% @ 65

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.008 | 0.011 | 0.013 | 0.015 | 0.017 | 0.019 |
| 51 | 0.007 | 0.010 | 0.012 | 0.013 | 0.015 | 0.017 |
| 52 | 0.010 | 0.014 | 0.017 | 0.019 | 0.021 | 0.024 |
| 53 | 0.008 | 0.012 | 0.015 | 0.017 | 0.019 | 0.022 |
| 54 | 0.012 | 0.016 | 0.019 | 0.022 | 0.025 | 0.028 |
| 55 | 0.018 | 0.025 | 0.031 | 0.035 | 0.038 | 0.043 |
| 56 | 0.015 | 0.021 | 0.025 | 0.029 | 0.032 | 0.036 |
| 57 | 0.020 | 0.028 | 0.033 | 0.038 | 0.043 | 0.048 |
| 58 | 0.024 | 0.033 | 0.040 | 0.046 | 0.052 | 0.058 |
| 59 | 0.028 | 0.039 | 0.048 | 0.054 | 0.060 | 0.067 |
| 60 | 0.049 | 0.069 | 0.083 | 0.094 | 0.105 | 0.118 |
| 61 | 0.062 | 0.087 | 0.106 | 0.120 | 0.133 | 0.150 |
| 62 | 0.104 | 0.146 | 0.177 | 0.200 | 0.223 | 0.251 |
| 63 | 0.099 | 0.139 | 0.169 | 0.191 | 0.213 | 0.239 |
| 64 | 0.097 | 0.136 | 0.165 | 0.186 | 0.209 | 0.233 |
| 65 | 0.140 | 0.197 | 0.240 | 0.271 | 0.302 | 0.339 |
| 66 | 0.092 | 0.130 | 0.157 | 0.177 | 0.198 | 0.222 |
| 67 | 0.129 | 0.181 | 0.220 | 0.249 | 0.277 | 0.311 |
| 68 | 0.092 | 0.129 | 0.156 | 0.177 | 0.197 | 0.221 |
| 69 | 0.092 | 0.130 | 0.158 | 0.178 | 0.199 | 0.224 |
| 70 | 0.103 | 0.144 | 0.175 | 0.198 | 0.221 | 0.248 |

Public Agency Miscellaneous 2% @ 60

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.010 | 0.011 | 0.014 | 0.014 | 0.017 | 0.017 |
| 51 | 0.017 | 0.013 | 0.014 | 0.010 | 0.010 | 0.010 |
| 52 | 0.014 | 0.014 | 0.018 | 0.015 | 0.016 | 0.016 |
| 53 | 0.015 | 0.012 | 0.013 | 0.010 | 0.011 | 0.011 |
| 54 | 0.006 | 0.010 | 0.017 | 0.016 | 0.018 | 0.018 |
| 55 | 0.012 | 0.016 | 0.024 | 0.032 | 0.036 | 0.036 |
| 56 | 0.010 | 0.014 | 0.023 | 0.030 | 0.034 | 0.034 |
| 57 | 0.006 | 0.018 | 0.030 | 0.040 | 0.044 | 0.044 |
| 58 | 0.022 | 0.023 | 0.033 | 0.042 | 0.046 | 0.046 |
| 59 | 0.039 | 0.033 | 0.040 | 0.047 | 0.050 | 0.050 |
| 60 | 0.063 | 0.069 | 0.074 | 0.090 | 0.137 | 0.116 |
| 61 | 0.044 | 0.058 | 0.066 | 0.083 | 0.131 | 0.113 |
| 62 | 0.084 | 0.107 | 0.121 | 0.153 | 0.238 | 0.205 |
| 63 | 0.173 | 0.166 | 0.165 | 0.191 | 0.283 | 0.235 |
| 64 | 0.120 | 0.145 | 0.164 | 0.147 | 0.160 | 0.172 |
| 65 | 0.138 | 0.160 | 0.214 | 0.216 | 0.237 | 0.283 |
| 66 | 0.198 | 0.228 | 0.249 | 0.216 | 0.228 | 0.239 |
| 67 | 0.207 | 0.242 | 0.230 | 0.233 | 0.233 | 0.233 |
| 68 | 0.201 | 0.234 | 0.225 | 0.231 | 0.231 | 0.231 |
| 69 | 0.152 | 0.173 | 0.164 | 0.166 | 0.166 | 0.166 |
| 70 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 |

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Miscellaneous 2% @ 55

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.014 | 0.014 | 0.017 | 0.021 | 0.023 | 0.024 |
| 51 | 0.013 | 0.017 | 0.017 | 0.018 | 0.018 | 0.019 |
| 52 | 0.013 | 0.018 | 0.018 | 0.020 | 0.020 | 0.021 |
| 53 | 0.013 | 0.019 | 0.021 | 0.024 | 0.025 | 0.026 |
| 54 | 0.017 | 0.025 | 0.028 | 0.032 | 0.033 | 0.035 |
| 55 | 0.045 | 0.042 | 0.053 | 0.086 | 0.098 | 0.123 |
| 56 | 0.018 | 0.036 | 0.056 | 0.086 | 0.102 | 0.119 |
| 57 | 0.041 | 0.046 | 0.056 | 0.076 | 0.094 | 0.120 |
| 58 | 0.052 | 0.044 | 0.048 | 0.074 | 0.106 | 0.123 |
| 59 | 0.043 | 0.058 | 0.073 | 0.092 | 0.105 | 0.126 |
| 60 | 0.059 | 0.064 | 0.083 | 0.115 | 0.154 | 0.170 |
| 61 | 0.087 | 0.074 | 0.087 | 0.107 | 0.147 | 0.168 |
| 62 | 0.115 | 0.123 | 0.151 | 0.180 | 0.227 | 0.237 |
| 63 | 0.116 | 0.127 | 0.164 | 0.202 | 0.252 | 0.261 |
| 64 | 0.084 | 0.138 | 0.153 | 0.190 | 0.227 | 0.228 |
| 65 | 0.167 | 0.187 | 0.210 | 0.262 | 0.288 | 0.291 |
| 66 | 0.187 | 0.258 | 0.280 | 0.308 | 0.318 | 0.319 |
| 67 | 0.195 | 0.235 | 0.244 | 0.277 | 0.269 | 0.280 |
| 68 | 0.228 | 0.248 | 0.250 | 0.241 | 0.245 | 0.245 |
| 69 | 0.188 | 0.201 | 0.209 | 0.219 | 0.231 | 0.231 |
| 70 | 0.229 | 0.229 | 0.229 | 0.229 | 0.229 | 0.229 |

Public Agency Miscellaneous 2.5% @ 55

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.014 | 0.017 | 0.027 | 0.035 | 0.046 | 0.050 |
| 51 | 0.019 | 0.021 | 0.025 | 0.030 | 0.038 | 0.040 |
| 52 | 0.018 | 0.020 | 0.026 | 0.034 | 0.038 | 0.037 |
| 53 | 0.013 | 0.021 | 0.031 | 0.045 | 0.052 | 0.053 |
| 54 | 0.025 | 0.025 | 0.030 | 0.046 | 0.057 | 0.068 |
| 55 | 0.029 | 0.042 | 0.064 | 0.109 | 0.150 | 0.225 |
| 56 | 0.036 | 0.047 | 0.068 | 0.106 | 0.134 | 0.194 |
| 57 | 0.051 | 0.047 | 0.060 | 0.092 | 0.116 | 0.166 |
| 58 | 0.035 | 0.046 | 0.062 | 0.093 | 0.119 | 0.170 |
| 59 | 0.029 | 0.053 | 0.072 | 0.112 | 0.139 | 0.165 |
| 60 | 0.039 | 0.069 | 0.094 | 0.157 | 0.177 | 0.221 |
| 61 | 0.080 | 0.077 | 0.086 | 0.140 | 0.167 | 0.205 |
| 62 | 0.086 | 0.131 | 0.149 | 0.220 | 0.244 | 0.284 |
| 63 | 0.135 | 0.135 | 0.147 | 0.214 | 0.222 | 0.262 |
| 64 | 0.114 | 0.128 | 0.158 | 0.177 | 0.233 | 0.229 |
| 65 | 0.112 | 0.174 | 0.222 | 0.209 | 0.268 | 0.273 |
| 66 | 0.235 | 0.254 | 0.297 | 0.289 | 0.321 | 0.337 |
| 67 | 0.237 | 0.240 | 0.267 | 0.249 | 0.267 | 0.277 |
| 68 | 0.258 | 0.271 | 0.275 | 0.207 | 0.210 | 0.212 |
| 69 | 0.117 | 0.208 | 0.266 | 0.219 | 0.250 | 0.270 |
| 70 | 0.229 | 0.229 | 0.229 | 0.229 | 0.229 | 0.229 |

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Miscellaneous 2.7% @ 55

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.011 | 0.016 | 0.022 | 0.033 | 0.034 | 0.038 |
| 51 | 0.018 | 0.019 | 0.023 | 0.032 | 0.031 | 0.031 |
| 52 | 0.019 | 0.020 | 0.026 | 0.035 | 0.034 | 0.037 |
| 53 | 0.020 | 0.020 | 0.025 | 0.043 | 0.048 | 0.053 |
| 54 | 0.018 | 0.030 | 0.040 | 0.052 | 0.053 | 0.070 |
| 55 | 0.045 | 0.058 | 0.082 | 0.138 | 0.208 | 0.278 |
| 56 | 0.057 | 0.062 | 0.080 | 0.121 | 0.178 | 0.222 |
| 57 | 0.045 | 0.052 | 0.071 | 0.106 | 0.147 | 0.182 |
| 58 | 0.074 | 0.060 | 0.074 | 0.118 | 0.163 | 0.182 |
| 59 | 0.058 | 0.067 | 0.086 | 0.123 | 0.158 | 0.187 |
| 60 | 0.087 | 0.084 | 0.096 | 0.142 | 0.165 | 0.198 |
| 61 | 0.073 | 0.084 | 0.101 | 0.138 | 0.173 | 0.218 |
| 62 | 0.130 | 0.133 | 0.146 | 0.187 | 0.214 | 0.249 |
| 63 | 0.122 | 0.140 | 0.160 | 0.204 | 0.209 | 0.243 |
| 64 | 0.104 | 0.124 | 0.154 | 0.202 | 0.214 | 0.230 |
| 65 | 0.182 | 0.201 | 0.242 | 0.264 | 0.293 | 0.293 |
| 66 | 0.272 | 0.249 | 0.273 | 0.285 | 0.312 | 0.312 |
| 67 | 0.182 | 0.217 | 0.254 | 0.249 | 0.264 | 0.264 |
| 68 | 0.223 | 0.197 | 0.218 | 0.242 | 0.273 | 0.273 |
| 69 | 0.217 | 0.217 | 0.217 | 0.217 | 0.217 | 0.217 |
| 70 | 0.227 | 0.227 | 0.227 | 0.227 | 0.227 | 0.227 |

Public Agency Miscellaneous 3% @ 60

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.015 | 0.020 | 0.025 | 0.039 | 0.040 | 0.044 |
| 51 | 0.041 | 0.034 | 0.032 | 0.041 | 0.036 | 0.037 |
| 52 | 0.024 | 0.020 | 0.022 | 0.039 | 0.040 | 0.041 |
| 53 | 0.018 | 0.024 | 0.032 | 0.047 | 0.048 | 0.057 |
| 54 | 0.033 | 0.033 | 0.035 | 0.051 | 0.049 | 0.052 |
| 55 | 0.137 | 0.043 | 0.051 | 0.065 | 0.076 | 0.108 |
| 56 | 0.173 | 0.038 | 0.054 | 0.075 | 0.085 | 0.117 |
| 57 | 0.019 | 0.035 | 0.059 | 0.088 | 0.111 | 0.134 |
| 58 | 0.011 | 0.040 | 0.070 | 0.105 | 0.133 | 0.162 |
| 59 | 0.194 | 0.056 | 0.064 | 0.081 | 0.113 | 0.163 |
| 60 | 0.081 | 0.085 | 0.133 | 0.215 | 0.280 | 0.333 |
| 61 | 0.080 | 0.090 | 0.134 | 0.170 | 0.223 | 0.292 |
| 62 | 0.137 | 0.153 | 0.201 | 0.250 | 0.278 | 0.288 |
| 63 | 0.128 | 0.140 | 0.183 | 0.227 | 0.251 | 0.260 |
| 64 | 0.174 | 0.147 | 0.173 | 0.224 | 0.239 | 0.264 |
| 65 | 0.152 | 0.201 | 0.262 | 0.299 | 0.323 | 0.323 |
| 66 | 0.272 | 0.273 | 0.317 | 0.355 | 0.380 | 0.380 |
| 67 | 0.218 | 0.237 | 0.268 | 0.274 | 0.284 | 0.284 |
| 68 | 0.200 | 0.228 | 0.269 | 0.285 | 0.299 | 0.299 |
| 69 | 0.250 | 0.250 | 0.250 | 0.250 | 0.250 | 0.250 |
| 70 | 0.245 | 0.245 | 0.245 | 0.245 | 0.245 | 0.245 |

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Miscellaneous 2% @ 62

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 51 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 52 | 0.005 | 0.008 | 0.012 | 0.015 | 0.019 | 0.031 |
| 53 | 0.007 | 0.011 | 0.014 | 0.018 | 0.021 | 0.032 |
| 54 | 0.007 | 0.011 | 0.015 | 0.019 | 0.023 | 0.034 |
| 55 | 0.010 | 0.019 | 0.028 | 0.036 | 0.061 | 0.096 |
| 56 | 0.014 | 0.026 | 0.038 | 0.050 | 0.075 | 0.108 |
| 57 | 0.018 | 0.029 | 0.039 | 0.050 | 0.074 | 0.107 |
| 58 | 0.023 | 0.035 | 0.048 | 0.060 | 0.073 | 0.099 |
| 59 | 0.025 | 0.038 | 0.051 | 0.065 | 0.092 | 0.128 |
| 60 | 0.031 | 0.051 | 0.071 | 0.091 | 0.111 | 0.138 |
| 61 | 0.038 | 0.058 | 0.079 | 0.100 | 0.121 | 0.167 |
| 62 | 0.044 | 0.074 | 0.104 | 0.134 | 0.164 | 0.214 |
| 63 | 0.077 | 0.105 | 0.134 | 0.163 | 0.192 | 0.237 |
| 64 | 0.072 | 0.101 | 0.129 | 0.158 | 0.187 | 0.242 |
| 65 | 0.108 | 0.141 | 0.173 | 0.206 | 0.239 | 0.300 |
| 66 | 0.132 | 0.172 | 0.212 | 0.252 | 0.292 | 0.366 |
| 67 | 0.132 | 0.172 | 0.212 | 0.252 | 0.292 | 0.366 |
| 68 | 0.120 | 0.156 | 0.193 | 0.229 | 0.265 | 0.333 |
| 69 | 0.120 | 0.156 | 0.193 | 0.229 | 0.265 | 0.333 |
| 70 | 0.120 | 0.156 | 0.193 | 0.229 | 0.265 | 0.333 |

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Fire ½ @ 55 and 2% @ 55

| Age | Rate |
|---|---|
| 50 | 0.016 |
| 51 | 0.000 |
| 52 | 0.034 |
| 53 | 0.020 |
| 54 | 0.041 |
| 55 | 0.075 |
| 56 | 0.111 |
| 57 | 0.000 |
| 58 | 0.095 |
| 59 | 0.044 |
| 60 | 1.000 |

Public Agency Police ½ @ 55 and 2% @ 55*

| Age | Rate |
|---|---|
| 50 | 0.026 |
| 51 | 0.000 |
| 52 | 0.016 |
| 53 | 0.027 |
| 54 | 0.010 |
| 55 | 0.167 |
| 56 | 0.069 |
| 57 | 0.051 |
| 58 | 0.072 |
| 59 | 0.070 |
| 60 | 0.300 |

* These rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Public Agency Police 2% @ 50

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.018 | 0.077 | 0.056 | 0.046 | 0.043 | 0.046 |
| 51 | 0.022 | 0.087 | 0.060 | 0.048 | 0.044 | 0.047 |
| 52 | 0.020 | 0.102 | 0.081 | 0.071 | 0.069 | 0.075 |
| 53 | 0.016 | 0.072 | 0.053 | 0.045 | 0.042 | 0.046 |
| 54 | 0.006 | 0.071 | 0.071 | 0.069 | 0.072 | 0.080 |
| 55 | 0.009 | 0.040 | 0.099 | 0.157 | 0.186 | 0.186 |
| 56 | 0.020 | 0.051 | 0.108 | 0.165 | 0.194 | 0.194 |
| 57 | 0.036 | 0.072 | 0.106 | 0.139 | 0.156 | 0.156 |
| 58 | 0.001 | 0.046 | 0.089 | 0.130 | 0.152 | 0.152 |
| 59 | 0.066 | 0.094 | 0.119 | 0.143 | 0.155 | 0.155 |
| 60 | 0.177 | 0.177 | 0.177 | 0.177 | 0.177 | 0.177 |
| 61 | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 |
| 62 | 0.184 | 0.184 | 0.184 | 0.184 | 0.184 | 0.184 |
| 63 | 0.250 | 0.250 | 0.250 | 0.250 | 0.250 | 0.250 |
| 64 | 0.177 | 0.177 | 0.177 | 0.177 | 0.177 | 0.177 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

- The above rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Fire 2% @ 50

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.054 | 0.054 | 0.056 | 0.080 | 0.064 | 0.066 |
| 51 | 0.020 | 0.020 | 0.021 | 0.030 | 0.024 | 0.024 |
| 52 | 0.037 | 0.037 | 0.038 | 0.054 | 0.043 | 0.045 |
| 53 | 0.051 | 0.051 | 0.053 | 0.076 | 0.061 | 0.063 |
| 54 | 0.082 | 0.082 | 0.085 | 0.121 | 0.097 | 0.100 |
| 55 | 0.139 | 0.139 | 0.139 | 0.139 | 0.139 | 0.139 |
| 56 | 0.129 | 0.129 | 0.129 | 0.129 | 0.129 | 0.129 |
| 57 | 0.085 | 0.085 | 0.085 | 0.085 | 0.085 | 0.085 |
| 58 | 0.119 | 0.119 | 0.119 | 0.119 | 0.119 | 0.119 |
| 59 | 0.167 | 0.167 | 0.167 | 0.167 | 0.167 | 0.167 |
| 60 | 0.152 | 0.152 | 0.152 | 0.152 | 0.152 | 0.152 |
| 61 | 0.179 | 0.179 | 0.179 | 0.179 | 0.179 | 0.179 |
| 62 | 0.179 | 0.179 | 0.179 | 0.179 | 0.179 | 0.179 |
| 63 | 0.179 | 0.179 | 0.179 | 0.179 | 0.179 | 0.179 |
| 64 | 0.179 | 0.179 | 0.179 | 0.179 | 0.179 | 0.179 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

Public Agency Police 3% @ 55

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.019 | 0.053 | 0.045 | 0.054 | 0.057 | 0.061 |
| 51 | 0.002 | 0.017 | 0.028 | 0.044 | 0.053 | 0.060 |
| 52 | 0.002 | 0.031 | 0.037 | 0.051 | 0.059 | 0.066 |
| 53 | 0.026 | 0.049 | 0.049 | 0.080 | 0.099 | 0.114 |
| 54 | 0.019 | 0.034 | 0.047 | 0.091 | 0.121 | 0.142 |
| 55 | 0.006 | 0.115 | 0.141 | 0.199 | 0.231 | 0.259 |
| 56 | 0.017 | 0.188 | 0.121 | 0.173 | 0.199 | 0.199 |
| 57 | 0.008 | 0.137 | 0.093 | 0.136 | 0.157 | 0.157 |
| 58 | 0.017 | 0.126 | 0.105 | 0.164 | 0.194 | 0.194 |
| 59 | 0.026 | 0.146 | 0.110 | 0.167 | 0.195 | 0.195 |
| 60 | 0.155 | 0.155 | 0.155 | 0.155 | 0.155 | 0.155 |
| 61 | 0.210 | 0.210 | 0.210 | 0.210 | 0.210 | 0.210 |
| 62 | 0.262 | 0.262 | 0.262 | 0.262 | 0.262 | 0.262 |
| 63 | 0.172 | 0.172 | 0.172 | 0.172 | 0.172 | 0.172 |
| 64 | 0.227 | 0.227 | 0.227 | 0.227 | 0.227 | 0.227 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

- The above rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Fire 3% @ 55

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.003 | 0.006 | 0.013 | 0.019 | 0.025 | 0.028 |
| 51 | 0.004 | 0.008 | 0.017 | 0.026 | 0.034 | 0.038 |
| 52 | 0.005 | 0.011 | 0.022 | 0.033 | 0.044 | 0.049 |
| 53 | 0.005 | 0.034 | 0.024 | 0.038 | 0.069 | 0.138 |
| 54 | 0.007 | 0.047 | 0.032 | 0.051 | 0.094 | 0.187 |
| 55 | 0.010 | 0.067 | 0.046 | 0.073 | 0.134 | 0.266 |
| 56 | 0.010 | 0.063 | 0.044 | 0.069 | 0.127 | 0.253 |
| 57 | 0.135 | 0.100 | 0.148 | 0.196 | 0.220 | 0.220 |
| 58 | 0.083 | 0.062 | 0.091 | 0.120 | 0.135 | 0.135 |
| 59 | 0.137 | 0.053 | 0.084 | 0.146 | 0.177 | 0.177 |
| 60 | 0.162 | 0.063 | 0.099 | 0.172 | 0.208 | 0.208 |
| 61 | 0.598 | 0.231 | 0.231 | 0.231 | 0.231 | 0.231 |
| 62 | 0.621 | 0.240 | 0.240 | 0.240 | 0.240 | 0.240 |
| 63 | 0.236 | 0.236 | 0.236 | 0.236 | 0.236 | 0.236 |
| 64 | 0.236 | 0.236 | 0.236 | 0.236 | 0.236 | 0.236 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

Public Agency Police 3% @ 50

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.124 | 0.103 | 0.113 | 0.143 | 0.244 | 0.376 |
| 51 | 0.060 | 0.081 | 0.087 | 0.125 | 0.207 | 0.294 |
| 52 | 0.016 | 0.055 | 0.111 | 0.148 | 0.192 | 0.235 |
| 53 | 0.072 | 0.074 | 0.098 | 0.142 | 0.189 | 0.237 |
| 54 | 0.018 | 0.049 | 0.105 | 0.123 | 0.187 | 0.271 |
| 55 | 0.069 | 0.074 | 0.081 | 0.113 | 0.209 | 0.305 |
| 56 | 0.064 | 0.108 | 0.113 | 0.125 | 0.190 | 0.288 |
| 57 | 0.056 | 0.109 | 0.160 | 0.182 | 0.210 | 0.210 |
| 58 | 0.108 | 0.129 | 0.173 | 0.189 | 0.214 | 0.214 |
| 59 | 0.093 | 0.144 | 0.204 | 0.229 | 0.262 | 0.262 |
| 60 | 0.343 | 0.180 | 0.159 | 0.188 | 0.247 | 0.247 |
| 61 | 0.221 | 0.221 | 0.221 | 0.221 | 0.221 | 0.221 |
| 62 | 0.213 | 0.213 | 0.213 | 0.213 | 0.213 | 0.213 |
| 63 | 0.233 | 0.233 | 0.233 | 0.233 | 0.233 | 0.233 |
| 64 | 0.234 | 0.234 | 0.234 | 0.234 | 0.234 | 0.234 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

- The above rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Fire 3% @ 50

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.095 | 0.048 | 0.053 | 0.093 | 0.134 | 0.175 |
| 51 | 0.016 | 0.032 | 0.053 | 0.085 | 0.117 | 0.149 |
| 52 | 0.013 | 0.032 | 0.054 | 0.087 | 0.120 | 0.154 |
| 53 | 0.085 | 0.044 | 0.049 | 0.089 | 0.129 | 0.170 |
| 54 | 0.038 | 0.065 | 0.074 | 0.105 | 0.136 | 0.167 |
| 55 | 0.042 | 0.043 | 0.049 | 0.085 | 0.132 | 0.215 |
| 56 | 0.133 | 0.103 | 0.075 | 0.113 | 0.151 | 0.209 |
| 57 | 0.062 | 0.048 | 0.060 | 0.124 | 0.172 | 0.213 |
| 58 | 0.124 | 0.097 | 0.092 | 0.153 | 0.194 | 0.227 |
| 59 | 0.092 | 0.071 | 0.078 | 0.144 | 0.192 | 0.233 |
| 60 | 0.056 | 0.044 | 0.061 | 0.131 | 0.186 | 0.233 |
| 61 | 0.282 | 0.219 | 0.158 | 0.198 | 0.233 | 0.260 |
| 62 | 0.292 | 0.227 | 0.164 | 0.205 | 0.241 | 0.269 |
| 63 | 0.196 | 0.196 | 0.196 | 0.196 | 0.196 | 0.196 |
| 64 | 0.197 | 0.197 | 0.197 | 0.197 | 0.197 | 0.197 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

Public Agency Police 2% @ 57

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 | 0.080 |
| 51 | 0.028 | 0.028 | 0.028 | 0.028 | 0.040 | 0.066 |
| 52 | 0.028 | 0.028 | 0.028 | 0.028 | 0.043 | 0.061 |
| 53 | 0.028 | 0.028 | 0.028 | 0.028 | 0.057 | 0.086 |
| 54 | 0.028 | 0.028 | 0.028 | 0.032 | 0.069 | 0.110 |
| 55 | 0.050 | 0.050 | 0.050 | 0.067 | 0.099 | 0.179 |
| 56 | 0.046 | 0.046 | 0.046 | 0.062 | 0.090 | 0.160 |
| 57 | 0.054 | 0.054 | 0.054 | 0.072 | 0.106 | 0.191 |
| 58 | 0.060 | 0.060 | 0.060 | 0.066 | 0.103 | 0.171 |
| 59 | 0.060 | 0.060 | 0.060 | 0.069 | 0.105 | 0.171 |
| 60 | 0.113 | 0.113 | 0.113 | 0.113 | 0.113 | 0.171 |
| 61 | 0.108 | 0.108 | 0.108 | 0.108 | 0.108 | 0.128 |
| 62 | 0.113 | 0.113 | 0.113 | 0.113 | 0.113 | 0.159 |
| 63 | 0.113 | 0.113 | 0.113 | 0.113 | 0.113 | 0.159 |
| 64 | 0.113 | 0.113 | 0.113 | 0.113 | 0.113 | 0.239 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

- The above rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Fire 2% @ 57

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.005 | 0.005 | 0.005 | 0.005 | 0.008 | 0.012 |
| 51 | 0.006 | 0.006 | 0.006 | 0.006 | 0.009 | 0.013 |
| 52 | 0.012 | 0.012 | 0.012 | 0.012 | 0.019 | 0.028 |
| 53 | 0.033 | 0.033 | 0.033 | 0.033 | 0.050 | 0.075 |
| 54 | 0.045 | 0.045 | 0.045 | 0.045 | 0.069 | 0.103 |
| 55 | 0.061 | 0.061 | 0.061 | 0.061 | 0.094 | 0.140 |
| 56 | 0.055 | 0.055 | 0.055 | 0.055 | 0.084 | 0.126 |
| 57 | 0.081 | 0.081 | 0.081 | 0.081 | 0.125 | 0.187 |
| 58 | 0.059 | 0.059 | 0.059 | 0.059 | 0.091 | 0.137 |
| 59 | 0.055 | 0.055 | 0.055 | 0.055 | 0.084 | 0.126 |
| 60 | 0.085 | 0.085 | 0.085 | 0.085 | 0.131 | 0.196 |
| 61 | 0.085 | 0.085 | 0.085 | 0.085 | 0.131 | 0.196 |
| 62 | 0.085 | 0.085 | 0.085 | 0.085 | 0.131 | 0.196 |
| 63 | 0.085 | 0.085 | 0.085 | 0.085 | 0.131 | 0.196 |
| 64 | 0.085 | 0.085 | 0.085 | 0.085 | 0.131 | 0.196 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

Public Agency Police 2.5% @ 57

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.100 |
| 51 | 0.038 | 0.038 | 0.038 | 0.038 | 0.055 | 0.089 |
| 52 | 0.038 | 0.038 | 0.038 | 0.038 | 0.058 | 0.082 |
| 53 | 0.036 | 0.036 | 0.036 | 0.036 | 0.073 | 0.111 |
| 54 | 0.036 | 0.036 | 0.036 | 0.041 | 0.088 | 0.142 |
| 55 | 0.061 | 0.061 | 0.061 | 0.082 | 0.120 | 0.217 |
| 56 | 0.056 | 0.056 | 0.056 | 0.075 | 0.110 | 0.194 |
| 57 | 0.060 | 0.060 | 0.060 | 0.080 | 0.118 | 0.213 |
| 58 | 0.072 | 0.072 | 0.072 | 0.079 | 0.124 | 0.205 |
| 59 | 0.072 | 0.072 | 0.072 | 0.083 | 0.126 | 0.205 |
| 60 | 0.135 | 0.135 | 0.135 | 0.135 | 0.135 | 0.205 |
| 61 | 0.130 | 0.130 | 0.130 | 0.130 | 0.130 | 0.153 |
| 62 | 0.135 | 0.135 | 0.135 | 0.135 | 0.135 | 0.191 |
| 63 | 0.135 | 0.135 | 0.135 | 0.135 | 0.135 | 0.191 |
| 64 | 0.135 | 0.135 | 0.135 | 0.135 | 0.135 | 0.287 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

- The above rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Fire 2.5% @ 57

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.007 | 0.007 | 0.007 | 0.007 | 0.010 | 0.015 |
| 51 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.018 |
| 52 | 0.016 | 0.016 | 0.016 | 0.016 | 0.025 | 0.038 |
| 53 | 0.042 | 0.042 | 0.042 | 0.042 | 0.064 | 0.096 |
| 54 | 0.057 | 0.057 | 0.057 | 0.057 | 0.088 | 0.132 |
| 55 | 0.074 | 0.074 | 0.074 | 0.074 | 0.114 | 0.170 |
| 56 | 0.066 | 0.066 | 0.066 | 0.066 | 0.102 | 0.153 |
| 57 | 0.090 | 0.090 | 0.090 | 0.090 | 0.139 | 0.208 |
| 58 | 0.071 | 0.071 | 0.071 | 0.071 | 0.110 | 0.164 |
| 59 | 0.066 | 0.066 | 0.066 | 0.066 | 0.101 | 0.151 |
| 60 | 0.102 | 0.102 | 0.102 | 0.102 | 0.157 | 0.235 |
| 61 | 0.102 | 0.102 | 0.102 | 0.102 | 0.157 | 0.236 |
| 62 | 0.102 | 0.102 | 0.102 | 0.102 | 0.157 | 0.236 |
| 63 | 0.102 | 0.102 | 0.102 | 0.102 | 0.157 | 0.236 |
| 64 | 0.102 | 0.102 | 0.102 | 0.102 | 0.157 | 0.236 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

Public Agency Police 2.7% @ 57

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.100 |
| 51 | 0.040 | 0.040 | 0.040 | 0.040 | 0.058 | 0.094 |
| 52 | 0.038 | 0.038 | 0.038 | 0.038 | 0.058 | 0.083 |
| 53 | 0.038 | 0.038 | 0.038 | 0.038 | 0.077 | 0.117 |
| 54 | 0.038 | 0.038 | 0.038 | 0.044 | 0.093 | 0.150 |
| 55 | 0.068 | 0.068 | 0.068 | 0.091 | 0.134 | 0.242 |
| 56 | 0.063 | 0.063 | 0.063 | 0.084 | 0.123 | 0.217 |
| 57 | 0.060 | 0.060 | 0.060 | 0.080 | 0.118 | 0.213 |
| 58 | 0.080 | 0.080 | 0.080 | 0.088 | 0.138 | 0.228 |
| 59 | 0.080 | 0.080 | 0.080 | 0.092 | 0.140 | 0.228 |
| 60 | 0.150 | 0.150 | 0.150 | 0.150 | 0.150 | 0.228 |
| 61 | 0.144 | 0.144 | 0.144 | 0.144 | 0.144 | 0.170 |
| 62 | 0.150 | 0.150 | 0.150 | 0.150 | 0.150 | 0.213 |
| 63 | 0.150 | 0.150 | 0.150 | 0.150 | 0.150 | 0.213 |
| 64 | 0.150 | 0.150 | 0.150 | 0.150 | 0.150 | 0.319 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

- The above rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

# Appendix A - Actuarial Methods and Assumptions

## Demographic Assumptions (continued)

Public Agency Fire 2.7% @ 57

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 50 | 0.007 | 0.007 | 0.007 | 0.007 | 0.010 | 0.015 |
| 51 | 0.008 | 0.008 | 0.008 | 0.008 | 0.013 | 0.019 |
| 52 | 0.016 | 0.016 | 0.016 | 0.016 | 0.025 | 0.038 |
| 53 | 0.044 | 0.044 | 0.044 | 0.044 | 0.068 | 0.102 |
| 54 | 0.061 | 0.061 | 0.061 | 0.061 | 0.093 | 0.140 |
| 55 | 0.083 | 0.083 | 0.083 | 0.083 | 0.127 | 0.190 |
| 56 | 0.074 | 0.074 | 0.074 | 0.074 | 0.114 | 0.171 |
| 57 | 0.090 | 0.090 | 0.090 | 0.090 | 0.139 | 0.208 |
| 58 | 0.079 | 0.079 | 0.079 | 0.079 | 0.122 | 0.182 |
| 59 | 0.073 | 0.073 | 0.073 | 0.073 | 0.112 | 0.168 |
| 60 | 0.114 | 0.114 | 0.114 | 0.114 | 0.175 | 0.262 |
| 61 | 0.114 | 0.114 | 0.114 | 0.114 | 0.175 | 0.262 |
| 62 | 0.114 | 0.114 | 0.114 | 0.114 | 0.175 | 0.262 |
| 63 | 0.114 | 0.114 | 0.114 | 0.114 | 0.175 | 0.262 |
| 64 | 0.114 | 0.114 | 0.114 | 0.114 | 0.175 | 0.262 |
| 65 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

## Miscellaneous Assumptions

**Internal Revenue Code Section 415**

The limitations on benefits imposed by Internal Revenue Code Section 415 are taken into account in this valuation. Each year the impact of any changes in this limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. This results in lower contributions for those employers contributing to the Replacement Benefit Fund and protects CalPERS from prefunding expected benefits in excess of limits imposed by federal tax law. The Section 415(b) dollar limit for the 2021 calendar year is $230,000.

**Internal Revenue Code Section 401(a)(17)**

The limitations on compensation imposed by Internal Revenue Code Section 401(a)(17) are taken into account in this valuation. Each year, the impact of any changes in the compensation limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. The compensation limit for classic members for the 2021 calendar year is $290,000.

# Appendix B – Summary of Principal Plan Provisions

## Description of Principal Plan Provisions

The following is a description of the principal plan provisions used in calculating costs and liabilities. We have indicated whether a plan provision is standard or optional. Standard benefits are applicable to all members while optional benefits vary among employers. Optional benefits that apply to a single period of time, such as Golden Handshakes, have not been included. Many of the statements in this summary are general in nature and are intended to provide an easily understood summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

## Service Retirement

### Eligibility

A CalPERS member becomes eligible for Service Retirement upon attainment of age 50 with at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements.) PEPRA Miscellaneous members become eligible for service retirement upon attainment of age 52 with at least 5 years of service.

### Benefit

The Service Retirement benefit calculated for service earned by members is a monthly allowance equal to the product of the *benefit factor*, *years of service* and *final compensation*.

- The *benefit factor* depends on the benefit formula specified in your agency's contract. The table below shows the factors for each of the available formulas. Factors vary by the member's age at retirement. Listed below are the factors for retirement at whole year ages:

**Miscellaneous Plan Formulas**

| Retirement Age | 2% @ 60 | 2% @ 55 | 2.5% @ 55 | 2.7% @ 55 | 3% @ 60 | PEPRA 2% @ 62 |
|---|---|---|---|---|---|---|
| 50 | 1.092% | 1.426% | 2.000% | 2.000% | 2.000% | N/A |
| 51 | 1.156% | 1.522% | 2.100% | 2.140% | 2.100% | N/A |
| 52 | 1.224% | 1.628% | 2.200% | 2.280% | 2.200% | 1.000% |
| 53 | 1.296% | 1.742% | 2.300% | 2.420% | 2.300% | 1.100% |
| 54 | 1.376% | 1.866% | 2.400% | 2.560% | 2.400% | 1.200% |
| 55 | 1.460% | 2.000% | 2.500% | 2.700% | 2.500% | 1.300% |
| 56 | 1.552% | 2.052% | 2.500% | 2.700% | 2.600% | 1.400% |
| 57 | 1.650% | 2.104% | 2.500% | 2.700% | 2.700% | 1.500% |
| 58 | 1.758% | 2.156% | 2.500% | 2.700% | 2.800% | 1.600% |
| 59 | 1.874% | 2.210% | 2.500% | 2.700% | 2.900% | 1.700% |
| 60 | 2.000% | 2.262% | 2.500% | 2.700% | 3.000% | 1.800% |
| 61 | 2.134% | 2.314% | 2.500% | 2.700% | 3.000% | 1.900% |
| 62 | 2.272% | 2.366% | 2.500% | 2.700% | 3.000% | 2.000% |
| 63 | 2.418% | 2.418% | 2.500% | 2.700% | 3.000% | 2.100% |
| 64 | 2.418% | 2.418% | 2.500% | 2.700% | 3.000% | 2.200% |
| 65 | 2.418% | 2.418% | 2.500% | 2.700% | 3.000% | 2.300% |
| 66 | 2.418% | 2.418% | 2.500% | 2.700% | 3.000% | 2.400% |
| 67 & up | 2.418% | 2.418% | 2.500% | 2.700% | 3.000% | 2.500% |

# Appendix B – Summary of Principal Plan Provisions

## Service Retirement (continued)

### Safety Plan Formulas

| Retirement Age | ½ % @ 55 (1) | 2% @ 55 | 2% @ 50 | 3% @ 55 | 3% @ 50 |
|---|---|---|---|---|---|
| 50 | 1.783% | 1.426% | 2.0% | 2.4% | 3.0% |
| 51 | 1.903% | 1.522% | 2.14% | 2.52% | 3.0% |
| 52 | 2.035% | 1.628% | 2.28% | 2.64% | 3.0% |
| 53 | 2.178% | 1.742% | 2.42% | 2.76% | 3.0% |
| 54 | 2.333% | 1.866% | 2.56% | 2.88% | 3.0% |
| 55 & Up | 2.5% | 2.0% | 2.7% | 3.0% | 3.0% |

(1) For this formula, the benefit factor also varies by entry age. The factors shown are for members with an entry age of 35 or larger. If entry age is less than 35, then the age 55 benefit factor is 50% divided by the difference between age 55 and entry age. The benefit factor for ages prior to age 55 is the same proportion of the age 55 benefit factor as in the above table.

### PEPRA Safety Plan Formulas

| Retirement Age | 2% at 57 | 2.5% at 57 | 2.7% at 57 |
|---|---|---|---|
| 50 | 1.426% | 2.000% | 2.000% |
| 51 | 1.508% | 2.071% | 2.100% |
| 52 | 1.590% | 2.143% | 2.200% |
| 53 | 1.672% | 2.214% | 2.300% |
| 54 | 1.754% | 2.286% | 2.400% |
| 55 | 1.836% | 2.357% | 2.500% |
| 56 | 1.918% | 2.429% | 2.600% |
| 57 & Up | 2.000% | 2.500% | 2.700% |

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. An agency may contract for an optional benefit where any unused sick leave accumulated at the time of retirement will be converted to credited service at a rate of 0.004 years of service for each day of sick leave.
- The *final compensation* is the monthly average of the member's highest 36 or 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). The standard benefit is 36 months. Employers have the option of providing a final compensation equal to the highest 12 consecutive months.
- For employees covered by Social Security, the Modified formula is the standard benefit. Under this type of formula, the final compensation is offset by $133.33 (or by one third if the final compensation is less than $400). Employers may contract for the Full benefit with Social Security that will eliminate the offset applicable to the final compensation. For employees not covered by Social Security, the Full benefit is paid with no offsets. Auxiliary organizations of the CSUC system may elect reduced contribution rates, in which case the offset is $317 if members are not covered by Social Security or $513 if members are covered by Social Security.
- The Miscellaneous Service Retirement benefit is not capped. The Safety Service Retirement benefit is capped at 90% of final compensation.

# Appendix B – Summary of Principal Plan Provisions

## Vested Deferred Retirement

### Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

### Eligibility to Start Receiving Benefits

The CalPERS member becomes eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 50.

### Benefit

The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

## Non-Industrial (Non-Job Related) Disability Retirement

### Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively employed by any CalPERS employer at the time of disability in order to be eligible for this benefit.

### Benefit

The Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8% of final compensation, multiplied by *service*, which is determined as follows:

- *Service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or
- *Service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3% of Final Compensation.

### Improved Benefit

Employers have the option of providing the improved Non-Industrial Disability Retirement benefit. This benefit provides a monthly allowance equal to 30% of final compensation for the first five years of service, plus 1% for each additional year of service to a maximum of 50% of final compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

## Industrial (Job Related) Disability Retirement

All safety members have this benefit. For miscellaneous members, employers have the option of providing this benefit. An employer may choose to provide the Increased benefit option or the Improved benefit option.

### Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes disabled while working, where disabled means the member is unable to perform the duties of the job because of a work-related illness or injury which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described below.

### Standard Benefit

The standard Industrial Disability Retirement benefit is a monthly allowance equal to 50% of final compensation.

### Increased Benefit (75% of Final Compensation)

The increased Industrial Disability Retirement benefit is a monthly allowance equal to 75% of final compensation for total disability.

### Improved Benefit (50% to 90% of Final Compensation)

The improved Industrial Disability Retirement benefit is a monthly allowance equal to the Workman's Compensation Appeals Board permanent disability rate percentage (if 50% or greater, with a maximum of 90%) times the final compensation.

For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return of accumulated member contributions with respect to employment in this group. With the standard or increased benefit, a member may also choose to receive the annuitization of the accumulated member contributions. If a member is eligible for Service Retirement and if the Service Retirement benefit is more than the Industrial Disability Retirement benefit, the member may choose to receive the larger benefit.

## Post-Retirement Death Benefit

### Standard Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $500 will be made to the retiree's designated survivor(s), or to the retiree's estate.

### Improved Lump Sum Payment

Employers have the option of providing an improved lump sum death benefit of $600, $2,000, $3,000, $4,000 or $5,000.

## Form of Payment for Retirement Allowance

### Standard Form of Payment

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

### Improved Form of Payment (Post Retirement Survivor Allowance)

Employers have the option to contract for the post retirement survivor allowance. For retirement allowances with respect to service subject to the modified formula, 25% of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. For retirement allowances with respect to service subject to the full or supplemental formula, 50% of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. This additional benefit is often referred to as post retirement survivor allowance (PRSA) or simply as survivor continuance.

In other words, 25% or 50% of the allowance, the continuance portion, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime. This benefit will not be discontinued in the event the spouse remarries.

The remaining 75% or 50% of the retirement allowance, which may be referred to as the option portion of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this option portion to be paid to any designated beneficiary after the retiree's death. Benefit options applicable to the option portion are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the option portion.

## Pre-Retirement Death Benefits

### Basic Death Benefit

This is a standard benefit.

Eligibility

An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this Basic Death benefit.

Benefit

The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5% per year, plus a lump sum in the amount of one month's salary for each completed year of current service, up to a maximum of six months' salary. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

### 1957 Survivor Benefit

This is a standard benefit.

Eligibility

An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this 1957 Survivor benefit.

Benefit

The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. The total amount paid will be at least equal to the Basic Death benefit.

# Appendix B – Summary of Principal Plan Provisions

### Optional Settlement 2W Death Benefit

This is an optional benefit.

Eligibility

An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed, has attained at least age 50, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this Optional Settlement 2W Death benefit.

Benefit

The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried children under age 18, if applicable. The total amount paid will be at least equal to the Basic Death Benefit.

### Special Death Benefit

This is a standard benefit for safety members. An employer may elect to provide this benefit for miscellaneous members.

Eligibility

An employee's *eligible survivor(s)* may receive the Special Death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The Special Death benefit is a monthly allowance equal to 50% of final compensation and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death at which time the allowance is continued to any unmarried children under age 22. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible surviving* children (*eligible* means unmarried children under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5% of final compensation
- if 2 eligible children: 20.0% of final compensation
- if 3 or more eligible children: 25.0% of final compensation

### Alternate Death Benefit for Local Fire Members

This is an optional benefit available only to local fire members.

Eligibility

An employee's *eligible survivor(s)* may receive the Alternate Death benefit in lieu of the Basic Death Benefit or the 1957 Survivor Benefit if the member dies while actively employed and has at least 20 years of total CalPERS service. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 18.

# Appendix B – Summary of Principal Plan Provisions

Benefit

The Alternate Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) If the member has not yet attained age 50, the benefit is equal to that which would be payable if the member had retired at age 50, based on service credited at the time of death. The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried children under age 18, if applicable. The total amount paid will be at least equal to the Basic Death Benefit.

## Cost-of-Living Adjustments

### Standard Benefit

The Retirement Law provides for the payment of an annual cost-of-living adjustment (COLA) to be paid each May, beginning the second calendar year after the year of retirement. The basic COLA provision is 2%. The COLA adjustment is limited to the lesser of two compounded numbers - the rate of inflation or the COLA contracted by the employer. This means that members may receive increases smaller than the COLA provision in years where the rate of inflation is lower that the COLA provision. Similarly, members may see increases larger than inflation and even the COLA provision in some years.

### Improved Benefit

Employers have the option of providing an improved cost-of-living adjustment of 3%, 4% or 5%.

## Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual’s allowance at 80% of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan.

## Refund of Employee Contributions

If the member’s service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6% interest.

## 1959 Survivor Benefits Program

This is a pre-retirement death benefit available only to members not covered by Social Security. Any agency joining CalPERS subsequent to 1993 was required to provide this benefit if the members were not covered by Social Security. The benefit is optional for agencies joining CalPERS prior to 1994. Levels 1, 2 and 3 are now closed. Any new agency or any agency wishing to add this benefit or increase the current level must choose the 4th or Indexed Level.

This benefit is not included in the results presented in this valuation. More information on this benefit is available on the CalPERS website at www.calpers.ca.gov.

# Appendix C – Summary of Participant Data

## Source of the Participant Data

The data was extracted from various databases within CalPERS and placed in a database by a series of extract programs. Included in this data is:

- Individual member and beneficiary information,
- Employment and payroll information,
- Accumulated contributions with interest,
- Service information,
- Benefit payment information,
- Information about the various organizations which contract with CalPERS, and
- Detailed information about the plan provisions applicable to each group of members.

## Data Validation Test and Adjustments

Once the information is extracted from the various computer systems into the database, update queries are then run against these data to correct for flaws found in the data. This part of the process is intended to validate the participant data for all CalPERS plans. The data are then checked for reasonableness and consistency with data from the prior valuation.

Checks on the data include:

- A reconciliation of the membership of the plans,
- Comparisons of various member statistics (average attained age, average entry age, average salary, etc.) for each plan with those from the prior valuation,
- Comparisons of pension amounts for each retiree and beneficiary receiving payments with those from the prior valuation,
- Checks for invalid ages and dates, and
- Reasonableness checks on various key data elements such as service and salary.

As a result of the tests on the data, a number of adjustments were determined to be necessary. These included:

- Dates of hire and dates of entry were adjusted where necessary to be consistent with the service fields, the date of birth and each other.

# Appendix C – Summary of Participant Data

## Summary of Valuation Data

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

| | June 30, 2020 | June 30, 2021 |
|---|---|---|
| **Number of Plans in the Risk Pool** | 119 | 119 |
| **Active Members** | 0 | 0 |
| **Transferred Members** | | |
| Counts | 101 | 95 |
| Average Attained Age | 48.82 | 49.07 |
| Average Years of Service | 4.43 | 4.41 |
| Average Annual Covered Pay | $113,639 | $113,637 |
| **Terminated Members** | | |
| Counts | 338 | 320 |
| Average Attained Age | 54.48 | 55.38 |
| Average Years of Service | 3.24 | 3.12 |
| Average Annual Covered Pay | $50,593 | $48,821 |
| **Retired Members and Beneficiaries** | | |
| Counts[1] | 847 | 834 |
| Average Attained Age | 75.69 | 75.44 |
| Average Annual Benefits | $8,834 | $9,077 |

(1) Values may not match those on pages C-3 to C-6 due to inclusion of community property settlements.

# Appendix C – Summary of Participant Data

## Transferred and Terminated Participants

### Distribution of Transfers to Other CalPERS Plans by Age and Years of Service

| Attained Age | Years of Service at Valuation Date 0 - 4 | 5 - 9 | 10 - 14 | 15 - 19 | 20 - 24 | 25+ | Total | Average Salary |
|---|---|---|---|---|---|---|---|---|
| 15 - 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 - 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 - 34 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 53,321 |
| 35 - 39 | 11 | 1 | 0 | 0 | 0 | 0 | 12 | 103,923 |
| 40 - 44 | 12 | 3 | 1 | 0 | 0 | 0 | 16 | 114,032 |
| 45 - 49 | 16 | 4 | 4 | 0 | 0 | 0 | 24 | 118,273 |
| 50 - 54 | 10 | 4 | 1 | 0 | 0 | 0 | 15 | 126,092 |
| 55 - 59 | 8 | 4 | 2 | 1 | 0 | 0 | 15 | 111,971 |
| 60 - 64 | 4 | 0 | 1 | 0 | 0 | 0 | 5 | 72,447 |
| 65 and over | 2 | 2 | 1 | 0 | 0 | 0 | 5 | 160,759 |
| **Total** | **66** | **18** | **10** | **1** | **0** | **0** | **95** | **113,759** |

### Distribution of Terminated Participants with Funds on Deposit by Age and Years of Service

| Attained Age | Years of Service at Valuation Date 0 - 4 | 5 - 9 | 10 - 14 | 15 - 19 | 20 - 24 | 25+ | Total | Average Salary |
|---|---|---|---|---|---|---|---|---|
| 15 - 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 - 29 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 29,640 |
| 30 - 34 | 6 | 1 | 0 | 0 | 0 | 0 | 7 | 38,584 |
| 35 - 39 | 13 | 1 | 0 | 0 | 0 | 0 | 14 | 52,507 |
| 40 - 44 | 15 | 1 | 2 | 2 | 0 | 0 | 20 | 55,290 |
| 45 - 49 | 30 | 7 | 1 | 0 | 1 | 0 | 39 | 48,399 |
| 50 - 54 | 55 | 8 | 1 | 3 | 0 | 0 | 67 | 56,701 |
| 55 - 59 | 56 | 4 | 4 | 3 | 0 | 0 | 67 | 51,233 |
| 60 - 64 | 45 | 9 | 0 | 1 | 0 | 2 | 57 | 46,541 |
| 65 and over | 41 | 5 | 1 | 0 | 0 | 1 | 48 | 38,731 |
| **Total** | **262** | **36** | **9** | **9** | **1** | **3** | **320** | **49,287** |

# Appendix C – Summary of Participant Data

## Retired Members and Beneficiaries

### Distribution of Retirees and Beneficiaries by Age and Retirement Type[1]

| Attained Age | Service Retirement | Non-Duty Disability | Duty Disability | Non-Duty Death | Duty Death | Death After Retirement | Total |
|---|---|---|---|---|---|---|---|
| Under 30 | 0 | 0 | 0 | 1 | 0 | 4 | 5 |
| 25 - 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 - 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 - 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 - 44 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 45 - 49 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 50 - 54 | 10 | 0 | 4 | 1 | 0 | 2 | 17 |
| 55 - 59 | 31 | 2 | 6 | 0 | 0 | 1 | 40 |
| 60 - 64 | 57 | 1 | 3 | 0 | 2 | 3 | 66 |
| 65 - 69 | 95 | 6 | 4 | 0 | 0 | 10 | 115 |
| 70 - 74 | 140 | 5 | 9 | 0 | 0 | 11 | 165 |
| 75 - 79 | 100 | 5 | 7 | 0 | 0 | 16 | 128 |
| 80 - 84 | 77 | 5 | 1 | 1 | 2 | 23 | 109 |
| 85 and over | 124 | 6 | 3 | 0 | 0 | 43 | 176 |
| **Total** | **634** | **30** | **38** | **3** | **4** | **114** | **823** |

(1) Counts of members do not include alternate payees receiving benefits while the member is still working. Therefore, the counts may not match information on page C-2 of the report. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

### Distribution of Annual Benefit Amounts for Retirees and Beneficiaries by Age and Retirement Type[1]

| Attained Age | Service Retirement | Non-Duty Disability | Duty Disability | Non-Duty Death | Duty Death | Death After Retirement | Total |
|---|---|---|---|---|---|---|---|
| Under 30 | 0 | 0 | 0 | 5,223 | 0 | 2,354 | 2,928 |
| 25 - 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 - 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 - 39 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 40 - 44 | 0 | 0 | 0 | 0 | 0 | 1,110 | 1,110 |
| 45 - 49 | 0 | 0 | 2,498 | 0 | 0 | 0 | 2,498 |
| 50 - 54 | 9,088 | 0 | 3,850 | 3,330 | 0 | 915 | 6,555 |
| 55 - 59 | 15,457 | 23,643 | 3,340 | 0 | 0 | 7,148 | 13,841 |
| 60 - 64 | 16,632 | 442 | 18,137 | 0 | 27,062 | 1,314 | 16,075 |
| 65 - 69 | 13,528 | 2,453 | 7,512 | 0 | 0 | 5,850 | 12,073 |
| 70 - 74 | 7,480 | 9,872 | 9,580 | 0 | 0 | 8,777 | 7,754 |
| 75 - 79 | 6,338 | 11,201 | 9,159 | 0 | 0 | 6,311 | 6,679 |
| 80 - 84 | 7,188 | 7,639 | 8,206 | 7,944 | 13,492 | 10,162 | 7,968 |
| 85 and over | 7,434 | 8,612 | 3,628 | 0 | 0 | 10,475 | 8,152 |
| **Average** | **9,400** | **8,589** | **7,679** | **5,499** | **20,277** | **8,453** | **9,198** |

(1) Counts of members do not include alternate payees receiving benefits while the member is still working. Therefore, the counts may not match information on page C-2 of the report. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

# Appendix C – Summary of Participant Data

## Retired Members and Beneficiaries (continued)

### Distribution of Retirees and Beneficiaries by Years Retired and Retirement Type[1]

| Years Retired | Service Retirement | Non-Duty Disability | Duty Disability | Non-Duty Death | Duty Death | Death After Retirement | Total |
|---|---|---|---|---|---|---|---|
| Under 5 Years | 101 | 1 | 5 | 1 | 0 | 36 | 144 |
| 5 - 9 | 120 | 3 | 7 | 1 | 0 | 21 | 152 |
| 10 - 14 | 103 | 2 | 1 | 0 | 0 | 15 | 121 |
| 15 - 19 | 96 | 3 | 6 | 0 | 1 | 15 | 121 |
| 20 - 24 | 76 | 5 | 8 | 1 | 0 | 11 | 101 |
| 25 - 29 | 52 | 5 | 4 | 0 | 1 | 6 | 68 |
| 30 and Over | 86 | 11 | 7 | 0 | 2 | 10 | 116 |
| **Total** | **634** | **30** | **38** | **3** | **4** | **114** | **823** |

(1) Counts of members do not include alternate payees receiving benefits while the member is still working. Therefore, the counts may not match information on page C-2 of the report. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

### Distribution of Average Benefit Amounts for Retirees and Beneficiaries by Years Retired and Retirement Type[1]

| Years Retired | Service Retirement | Non-Duty Disability | Duty Disability | Non-Duty Death | Duty Death | Death After Retirement | Average |
|---|---|---|---|---|---|---|---|
| Under 5 Years | 13,986 | 2,520 | 4,434 | 5,223 | 0 | 9,952 | 12,505 |
| 5 - 9 | 13,359 | 15,909 | 3,652 | 3,330 | 0 | 12,652 | 12,799 |
| 10 - 14 | 9,041 | 8,376 | 21,064 | 0 | 0 | 10,630 | 9,327 |
| 15 - 19 | 5,977 | 8,854 | 1,616 | 0 | 30,815 | 4,568 | 5,863 |
| 20 - 24 | 6,036 | 10,394 | 16,971 | 7,944 | 0 | 5,374 | 7,064 |
| 25 - 29 | 7,162 | 7,955 | 9,651 | 0 | 23,308 | 2,837 | 7,222 |
| 30 and Over | 7,066 | 6,579 | 5,565 | 0 | 13,492 | 3,555 | 6,738 |
| **Average** | **9,400** | **8,589** | **7,679** | **5,499** | **20,277** | **8,453** | **9,198** |

(1) Counts of members do not include alternate payees receiving benefits while the member is still working. Therefore, the counts may not match information on page C-2 of the report. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

# Appendix C – Summary of Participant Data

## Retired Members and Beneficiaries (continued)

### Distribution of Annual Benefit Amounts by Age and Retirement Type

Annual Amounts do not Include PPPA Payments

| Attained Age | Service Retirement | Non-Duty Disability | Duty Disability | Non-Duty Death | Duty Death | Death After Retirement | Total |
|---|---|---|---|---|---|---|---|
| Under 30 | 0 | 0 | 0 | 5,223 | 0 | 9,416 | 14,639 |
| 25 - 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 - 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 - 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 - 44 | 0 | 0 | 0 | 0 | 0 | 1,110 | 1,110 |
| 45 - 49 | 0 | 0 | 2,498 | 0 | 0 | 0 | 2,498 |
| 50 - 54 | 90,878 | 0 | 15,401 | 3,330 | 0 | 1,830 | 111,439 |
| 55 - 59 | 479,168 | 47,285 | 20,039 | 0 | 0 | 7,148 | 553,640 |
| 60 - 64 | 948,031 | 442 | 54,411 | 0 | 54,123 | 3,942 | 1,060,949 |
| 65 - 69 | 1,285,173 | 14,719 | 30,049 | 0 | 0 | 58,500 | 1,388,441 |
| 70 - 74 | 1,047,237 | 49,360 | 86,216 | 0 | 0 | 96,550 | 1,279,363 |
| 75 - 79 | 633,837 | 56,003 | 64,112 | 0 | 0 | 100,983 | 854,935 |
| 80 - 84 | 553,467 | 38,195 | 8,206 | 7,944 | 26,983 | 233,734 | 868,529 |
| 85 and over | 921,766 | 51,670 | 10,883 | 0 | 0 | 450,407 | 1,434,726 |
| **Total** | **5,959,557** | **257,674** | **291,815** | **16,497** | **81,106** | **963,620** | **7,570,269** |

### Distribution of Annual Benefit Amounts for Retirees and Beneficiaries by Years Retired and Retirement Type

Annual Amounts do not Include PPPA Payments

| Years Retired | Service Retirement | Non-Duty Disability | Duty Disability | Non-Duty Death | Duty Death | Death After Retirement | Average |
|---|---|---|---|---|---|---|---|
| Under 5 Years | 1,412,608 | 2,520 | 22,170 | 5,223 | 0 | 358,265 | 1,800,786 |
| 5 - 9 | 1,603,085 | 47,727 | 25,561 | 3,330 | 0 | 265,701 | 1,945,404 |
| 10 - 14 | 931,257 | 16,751 | 21,064 | 0 | 0 | 159,452 | 1,128,524 |
| 15 - 19 | 573,776 | 26,562 | 9,697 | 0 | 30,815 | 68,513 | 709,363 |
| 20 - 24 | 458,706 | 51,968 | 135,768 | 7,944 | 0 | 59,119 | 713,505 |
| 25 - 29 | 372,420 | 39,774 | 38,603 | 0 | 23,308 | 17,019 | 491,124 |
| 30 and Over | 607,705 | 72,372 | 38,952 | 0 | 26,983 | 35,551 | 781,563 |
| **Total** | **5,959,557** | **257,674** | **291,815** | **16,497** | **81,106** | **963,620** | **7,570,269** |

# Appendix D – List of Terminated Agencies

Alhambra Redevelopment Agency
Armona Community Services District
Aromas Tri-County Fire District
Associated Students of California State University, Chico
Bay Area Library and Information System
Bay Area Sewage Services Agency
Ben Lomond Fire Protection District
California Egg Marketing/Research Agreement (1st Level)
California State University Foundation
California State University, Dominguez Hills Foundation
California State University, Fullerton Foundation
California Tahoe Regional Planning Agency
Camanche Regional Park District
Carmel Valley Fire Protection District
Central Coast Computing Authority
Central Coast Regional Criminal Justice Planning Board
Central Sierra Planning Council
Chico State University Foundation
Citrus Pest Control District # 2 of Riverside County
City of Loyalton
City of Pittsburg
City of Placentia
City of Westmorland
Coalinga-Huron Mosquito Abatement District
College of The Desert, Associated Students Of
College Town
Cooperative Library Agency for Systems and Services
Corona City Redevelopment Agency
Daly City Redevelopment Agency
Deer Springs Fire Protection District
Descanso Community Water District
East San Gabriel Valley Human Services Consortium
Eel River Water Council
El Pueblo De Los Angeles State Historical Monument Commission
El Toro Water District
Etna Cemetery District
Exposition Metro Line Construction Authority
Fallbrook Hospital District
Fort Ord Reuse Authority
Fremont(John C) Hospital District
Fresno City Redevelopment Agency
Fresno State College Agricultural Foundation
Gilroy Rural Fire Protection District
Glen Ellen Fire Protection District
Golden Empire Transit District
Halcumb Cemetery District
Hamilton City Community Services District
Heffernan Memorial Hospital District
Herald Fire Protection District
Humboldt Bay Wastewater Authority
Idyllwild Water District
Independent Data Processing Center
Inland Manpower Association
Janesville Fire Protection District
Jefferson School District Federal Credit Union
Kaweah Delta Hospital District
La Branza Water District
Laney College Bookstore
Long Beach Promotion and Service Corporation
Lower Sweetwater Fire Protection District
Madera County Economic Development Commission
Mark Twain Hospital District
Meadow Vista County Water District
Metro Gold Line Foothill Extension Construction Authority
Mid City Development Corporation
Newport Beach City Employees Federal Credit Union
Niland Sanitary District
Northridge State University Student Center, Inc.
Orange County Intergovernmental Coordinating Council
Orange Cove Fire Protection District of Fresno And Tulare Counties
**Oroville Mosquito Abatement District**
Palo Verde Cemetery District
Paradise Fire Protection District
Paso Robles District Cemetery
Pioneer Community Services District
Placer Consolidated Fire Protection District
Plumas County Housing Authority
Provident Central Credit Union
Sacramento State University Associated Students
San Benito Hospital District
San Diego Rural Fire Protection District
San Diego State University Foundation
San Francisco State University Franciscan Shops
San Francisco State University Frederick Burke Foundation
San Jose Housing Authority
San Jose State University Spartan Shops, Inc.
San Jose State University, Associated Students
San Luis Obispo Regional Transit Authority
San Marcos Cemetery District
San Mateo Local Agency Formation Commission
Sanitation Districts of Orange County
Santa Barbara County Housing Authority
Santa Clara City Redevelopment Agency
Santa Clara County Traffic Authority
Santa Cruz Port District
Saratoga Cemetery District
School Personnel Credit Union
Selection Consulting Center
Shasta Local Agency Formation Commission
Shasta-Trinity Schools Insurance Group
Soledad Community Health Care District
South Lake County Fire Protection District
Southeast Recreation and Park District
Southern Mono Hospital District
Springville Public Utility District
Student Union of San Jose State University
Sunline Transit Agency
Three Arch Bay Community Services District
Torrance City Redevelopment Agency
Trinity County Waterworks District
Tulare County Housing Authority
Veterans Home of California Post Fund
Victorville Fire Protection District
Weaverville Fire Protection District
West Bay Rapid Transit Authority
West Contra Costa Hospital District

# Appendix E – Glossary of Actuarial Terms

**Accrued Liability (Actuarial Accrued Liability)** The portion of the Present Value of Benefits allocated to prior years. Based on CalPERS funding Policies, the accrued liability is the target level of assets on any valuation date.

**Actuarial Assumptions:** Assumptions made about certain events that will affect pension costs. Assumptions generally can be broken down into two categories: demographic and economic. Demographic assumptions include such things as mortality, disability, and retirement rates. Economic assumptions include discount rate, salary growth and inflation.

**Actuarial Methods:** Procedures employed by actuaries to achieve certain funding goals of a pension plan. Actuarial methods include an actuarial cost method, an amortization policy, and an asset valuation method.

**Actuarial Valuation:** The determination, as of a valuation date of the Normal Cost, Accrued Liability, and related actuarial present values for a pension plan. These valuations are performed annually or when an employer is contemplating a change to their plan provisions.

**Amortization Bases:** Separate payment schedules for different portions of the Unfunded Accrued Liability (UAL). The total UAL of a rate plan can be segregated by cause. The impact of such individual causes on the UAL are quantified at the time of their occurrence, resulting in new amortization bases. Each base is creating “bases” separately amortized and paid for over a specific period of time. Generally, in an actuarial valuation, the separate bases consist of changes in UAL due to contract amendments, actuarial assumptions changes, method changes and/or gains and losses.

**Amortization Period:** The number of years required to pay off an Amortization base.

**Classic Member (under PEPRA):** A classic member is a member who joined CalPERS prior to January 1, 2013 and who is not defined as a new member under PEPRA. (See definition of New Member below.)

**Discount Rate:** This is the rate used to discount the expected future benefit payments to the valuation date to determine the Projected Value of Benefits. The discount rate is based on the assumed long-term rate of return on plan assets, net of investment and administrative expenses. This rate is called the “actuarial interest rate” in Section 20014 of the California Public Employees’ Retirement Law (PERL).

**Entry Age:** The earliest age at which a plan member begins to accrue benefits under a defined benefit pension plan. In most cases, this is the age of the member on their date of hire.

**Entry Age Actuarial Cost Method:** An actuarial cost method designed to fund a member's total plan benefit evenly over the course of his or her career. This method yields a total normal cost rate, expressed as a percentage of payroll, which is designed to remain level throughout the member’s career.

**Fresh Start:** A Fresh Start is when multiple amortization bases are combined into a single base and amortized over a new Amortization Period.

**Funded Ratio:** Defined as the Market Value of Assets divided by the Accrued Liability. It is a measure of how well funded, a rate plan is. A ratio greater than 100% means the rate plan has more assets than the target established by CalPERS funding policies on the valuation date, and the employer needs to only contribute the Normal Cost. A ratio less than 100% means assets are less than the funding target, and contributions in addition to Normal Cost are required.

**GASB 68:** Statement No. 68 of the Governmental Accounting Standards Board. The accounting standard governing a state or local governmental employer's accounting and financial reporting for pensions.

**New Member (under PEPRA)**: A new member includes an individual who becomes a member of a public retirement system for the first time on or after January 1, 2013, and who was not a member of another public retirement system prior to that date, and who is not subject to reciprocity with another public retirement system.

**Normal Cost:** The portion of the Present Value of Benefits allocated to the upcoming fiscal year for active employees. The normal cost plus the required amortization of the UAL, if any, make up the required contributions.

**Pension Actuary:** A business professional proficient in mathematics and statistics who performs the calculations necessary to properly fund a pension plan and allow the plan sponsor to disclose its liabilities. A pension actuary must satisfy the Qualification Standards for Actuaries issuing Statements of Actuarial Opinion in the United States with regard to pensions.

**Present Value of Benefits (PVB):** The total dollars needed as of the valuation date to fund all benefits earned in the past or expected to be earned in the future for *current* members.

**Unfunded Accrued Liability (UAL)**: The accrued Liability minus the Market Value of Assets. If the UAL for a rate plan is positive, the employer is required to make contributions in excess of the Normal Cost.

Actuarial Office
P.O. Box 942709 Sacramento, CA 94229-2709
TTY - (877) 249-7442
(888) 225-7377
FAX (916) 795-2744

Available online at CalPERS Website

CalPERS

California Public Employees' Retirement System A Component Unit of the State of California