Cavanaugh Macdonald
CONSULTING, LLC

*The experience and dedication you deserve*

# University of Puerto Rico Retirement System

# Actuarial Valuation Report

# As of June 30, 2019

www.CavMacConsulting.com

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

January 20, 2021

Retirement Board and Governing Board
University of Puerto Rico
Retirement System
P.O. Box 21769
San Juan, Puerto Rico 00925

Dear Board Members:

We are pleased to submit the results of the annual actuarial valuation of the University of Puerto Rico Retirement System (the System) as of June 30, 2019.

The purpose of this report is to provide a summary of the funded status of the System as of June 30, 2019 and to recommend rates of contribution. While not verifying the data at source, the actuary performed tests for consistency and reasonability.

In the table below, we present the contribution rates and estimated required University contribution amount for fiscal year 2020. For comparison we also present the contribution rates and amounts for fiscal year 2019 based on the 2018 valuation.

| Valuation Date | June 30, 2019 | June 30, 2018 |
|---|---|---|
| **Recommended Contributions for Fiscal Year** | **2020** | **2019** |
| Total Contribution Rate | 41.25% | 36.93% |
| Average Member Contribution Rate | 8.80% | 8.81% |
| University Contribution Rate | 32.45% | 28.12% |
| Estimated University Contribution ($'s millions) | $ 138.9 | $ 127.6 |
| Actuarial Value Assets Funded Status | 42.8% | 43.7% |
| Payroll Growth Assumption | 1.50% | 2.00% |

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144
Phone (678) 388-1700 • Fax (678) 388-1730
www.CavMacConsulting.com
Offices in Kennesaw, GA • Bellevue, NE

The promised benefits of the System are included in the actuarially calculated contribution rates, which are developed using the individual entry age normal cost method. A five-year smoothing of the market value of assets is used for actuarial valuation purposes. Gains and losses are reflected in the unfunded accrued liability that is being amortized by regular annual contributions as a level percentage of payroll over a closed 30-year period, on the assumption that payroll will increase by 1.5% per year and the amortization period will decrease by one year until reaching 0 years. The assumptions recommended by the actuary are, in the aggregate, reasonably related to the experience under the System and to reasonable expectations of anticipated experience under the System.

The assumptions and methods adopted by the Board include the assumption that payroll will grow by 1.5% per year in the future. Since 2011, payroll has declined by 2.18% per year. Due to the poor funded status of the System and the fact that total payroll is actually declining, we **do not** recommend the use of level percentage of pay financing of the unfunded accrued liability. For informational purposes, below we present the University contribution rates based on the recommended assumptions and methods, including amortization of the unfunded accrued liability over a closed 30-year period beginning July 1, 2014 and assuming that payroll will remain level over the period.

| Valuation Date | June 30, 2019 | June 30, 2018 |
|---|---|---|
| **Contributions for Fiscal Year** | **2020** | **2019** |
| Total Contribution Rate | 45.84% | 42.57% |
| Average Member Contribution Rate | 8.80% | 8.81% |
| University Contribution Rate | 37.04% | 33.76% |
| Estimated University Contribution ($'s millions) | $ 158.6 | $ 153.2 |
| Actuarial Value Assets Funded Status | 42.8% | 43.7% |
| Payroll Growth Assumption | 0.00% | 0.00% |

Below we also present a comparison of the University contribution rate and the estimated contribution amount assuming a closed 40-year period beginning July 1, 2015 in accordance with Certification No. 146 adopted by the Governing Board of the University during the 2015 fiscal year.

| Unfunded Accrued Liability Amortization Method | Closed 30 Year (Level Percentage) ADOPTED ASSUMPTIONS | Closed 40 Year (Level Percentage) ADOPTED ASSUMPTIONS |
|---|---|---|
| **Contributions for Fiscal Year** | **2020** | **2020** |
| Total Contribution Rate | 41.25% | 36.68% |
| Average Member Contribution Rate | 8.80% | 8.80% |
| University Contribution Rate | 32.45% | 27.88% |
| Estimated University Contribution ($'s millions) | $ 138.9 | $ 119.4 |
| Amortization Period | 25 years | 36 Years |
| Payroll Growth Assumption | 1.50% | 1.50% |

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

The undersigned is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

The Table of Contents, which immediately follows, outlines the material contained in the report.

Respectfully submitted,

Todd B. G

Todd B. Green, ASA, FCA, MAAA
President

*Table of Contents*

1. For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized in the following table.

**SUMMARY OF PRINCIPAL RESULTS**

| | June 30, 2019 | June 30, 2018 |
|---|---|---|
| Number of Active Members | 9,140 | 9,635 |
| Annual Covered Payroll (Salary used for valuation purposes) | $428,085,691 | $453,802,083 |
| Number of Retired and Disabled Members and Survivors | 9,096 | 8,816 |
| Annual Benefits | $209,485,025 | $199,686,863 |
| Number of Terminated Vested Members | 591 | 469 |
| Number of Non-Vested Terminated Members | 8,133 | 7,748 |
| Total Assets | | |
| Actuarial Value | $1,385,992,022 | $1,401,187,212 |
| Market Value | $1,403,702,320 | $1,408,375,956 |
| Actuarial Accrued Liability | $3,236,419,538 | $3,207,632,525 |
| Unfunded Actuarial Accrued Liability | $1,850,427,516 | $1,806,445,313 |
| Actuarial Value Assets Funded Status | 42.8% | 43.7% |
| Market Value Assets Funded Status | 43.4% | 43.9% |
| **CONTRIBUTIONS FOR FISCAL YEAR ENDING** | **June 30, 2020** | **June 30, 2019** |
| Total Contribution Rate: | | |
| Normal (Including Administrative Expenses) | 9.58% | 9.68% |
| Unfunded Accrued Liability | 31.67% | 27.25% |
| Total Contribution Rate | 41.25% | 36.93% |
| Average Member Contribution Rate | 8.80% | 8.81% |
| University Contribution Rate | 32.45% | 28.12% |
| Amortization Period | 25 years | 26 years |

2. Comments on the valuation results as of June 30, 2019 are given in Section IV and further discussion of the contribution levels is set out in Section V.

3. Schedule B shows the development of the actuarial value of assets. Schedules D and E of this report outline the full set of actuarial assumptions and methods used in the current valuation. There have been no changes since the previous valuation.

4. The valuation takes into account the effect of amendments to the System through the valuation date. The Main Provisions of the System, as summarized in Schedule F, were taken into account in the current valuation. There have been no changes since the previous valuation.

1. Membership data for use in the valuation was furnished by the System. The following table shows the number of active members and their annual compensation for valuation purposes, as of June 30, 2019, on which the valuation was based.

**TABLE 1**

**THE NUMBER AND ANNUAL COMPENSATION OF ACTIVE MEMBERS AS OF JUNE 30, 2019**

| Number | Compensation | Average Compensation | Average Age | Average Service |
|---|---|---|---|---|
| 9,140 | $428,085,691 | $46,837 | 50.2 | 17.9 |

2. The following table shows a five-year history of active member valuation data.

**TABLE 2**

**SCHEDULE OF TOTAL ACTIVE MEMBER VALUATION DATA**

| Valuation Date | Number | Annual Compensation | Average Annual Compensation | % Increase in Average Compensation |
|---|---|---|---|---|
| 6/30/2019 | 9,140 | $428,085,691 | $46,837 | -0.6% |
| 6/30/2018 | 9,635 | 453,802,083 | 47,099 | 0.4 |
| 6/30/2017 | 10,204 | 478,529,460 | 46,896 | 0.1 |
| 6/30/2016 | 10,438 | 488,774,924 | 46,826 | -0.5 |
| 6/30/2015 | 10,644 | 500,964,899 | 47,065 | 0.6 |

3. The following table shows the number and annual retirement benefits payable to retired members and survivors on the roll of the System as of the valuation date.

**TABLE 3**

**THE NUMBER AND ANNUAL RETIREMENT BENEFITS
OF RETIRED MEMBERS AND SURVIVORS OF DECEASED MEMBERS
AS OF JUNE 30, 2019**

| Type of Retirement | Number | Annual Benefits | Average Monthly Benefit | Average Age | Actuarial Liabilities |
|---|---|---|---|---|---|
| Retiree | 8,010 | $200,035,659 | $2,081 | 72.3 | $1,923,251,660 |
| Disability | 1,050 | $9,205,741 | $731 | 69.6 | $76,918,595 |
| Beneficiary | 36 | $243,625 | $564 | 69.5 | $1,947,178 |
| Total | 9,096 | $209,485,025 | $1,919 | | $2,002,117,433 |

4. Schedule G shows the distribution by age and service of the number and annual compensation of active members.

Schedule C shows the additions and deductions for the year preceding the valuation date and a reconciliation of the fund balances at market value. The market value of assets as of June 30, 2019 used to determine the actuarial value of assets is shown below. The market related actuarial value of assets used for the current valuation was $1,385,992,022. Schedule B shows the development of the actuarial value of assets. The following table shows historical asset information. The market value return over the 20 year period shown below was 6.52%.

**TABLE 4**

**HISTORICAL ASSET INFORMATION**
**(in $1,000s)**

| Plan Year | Market Value as of June 30 | Actuarial Value as of June 30 | Benefit Payments | Expenses | University and Member Contribs. | Market Value Yield | Actuarial Value Yield |
|---|---|---|---|---|---|---|---|
| 2019 | $1,403,702 | $1,385,992 | $207,823 | $3,751 | $108,112 | 7.3% | 6.5% |
| 2018 | 1,408,376 | 1,401,187 | 198,247 | 4,458 | 109,223 | 8.2% | 9.2% |
| 2017 | 1,385,630 | 1,371,979 | 188,311 | 4,120 | 112,244 | 10.3% | 10.2% |
| 2016 | 1,332,668 | 1,321,210 | 182,614 | 4,075 | 116,643 | 4.5% | 9.6% |
| 2015 | 1,342,996 | 1,272,123 | 176,872 | 4,172 | 123,845 | 5.8% | 12.9% |
| 2014 | 1,325,365 | 1,179,752 | 169,163 | 3,914 | 129,589 | 18.2% | 14.6% |
| 2013 | 1,161,569 | 1,070,402 | 162,182 | 3,777 | 115,333 | 15.2% | 8.1% |
| 2012 | 1,055,909 | 1,039,441 | 153,890 | 3,518 | 114,405 | 4.5% | 4.0% |
| 2011 | 1,052,467 | 1,041,628 | 143,198 | 3,070 | 110,823 | 20.9% | 4.8% |
| 2010 | 902,867 | 1,028,918 | 133,113 | 3,709 | 112,915 | 13.0% | 1.8% |
| 2009 | 821,867 | 1,034,645 | 124,353 | 3,935 | 116,436 | -12.7% | 2.1% |
| 2008 | 954,307 | 1,024,987 | 118,779 | 3,640 | 124,518 | -5.0% | 7.3% |
| 2007 | 1,002,117 | 953,197 | 110,831 | 3,443 | 118,341 | 14.8% | 9.2% |
| 2006 | 869,349 | 869,211 | 105,090 | 3,263 | 112,368 | 7.3% | 5.4% |
| 2005 | 806,229 | 820,501 | 100,459 | 3,781 | 105,755 | 8.2% | 1.9% |
| 2004 | 743,761 | 803,498 | 94,188 | 2,675 | 102,369 | 11.4% | 2.5% |
| 2003 | 662,518 | 778,265 | 89,313 | 2,420 | 88,988 | 4.0% | 2.1% |
| 2002 | 639,813 | 765,329 | 84,455 | 2,105 | 78,220 | -5.6% | 12.8% |
| 2001 | 686,067 | 686,067 | 78,613 | 2,178 | 78,424 | -8.7% | -8.7% |
| 2000 | 754,280 | 754,280 | 72,043 | 2,215 | 72,036 | 16.4% | 16.4% |

1. The total valuation balance sheet on account of benefits shows that the System has total prospective benefit liabilities of $3,486,441,922, of which $2,002,117,433 is for the prospective benefits payable on account of present retired members, disabled members and survivors of deceased members, $82,955,831 is for the prospective benefits payable on account of inactive members entitled to future benefits, and $1,401,368,658 is for the prospective benefits payable on account of present active members. Against these benefit liabilities the System has a total present actuarial value of assets of $1,385,992,022 as of June 30, 2019. The difference of $2,100,449,900 between the total liabilities and the total present actuarial value of assets represents the present value of contributions to be made in the future on account of benefits. Of this amount, $241,756,047 is the present value of future contributions expected to be made by members, and the balance of $1,858,693,853 represents future University contributions.

2. The University's contributions to the System consist of normal contributions and unfunded actuarial accrued liability (UAAL) contributions. The valuation indicates that employer normal contributions at the rate of 0.78% of payroll are required. Prospective employer normal contributions have a present value of $8,266,337. When this amount is subtracted from $1,858,693,853, which is the present value of the total future contributions to be made by the employers, there remains $1,850,427,516 as the amount of future UAAL contributions.

3. In accordance with Board Resolution #5, the accrued liability contribution rate payable on account of retirement benefits has been set at 31.67% of payroll. This rate is sufficient to liquidate the unfunded accrued liability of $1,850,427,516 over 25 years beginning June 30, 2019 on the assumption that the aggregate payroll will increase 1.50% each year.

## *Section V – Contributions Payable by Employer*

The employer contribution rates according to the Rules and Regulations of the System are shown in the following table.

**TABLE 5**

| | June 30, 2019 | June 30, 2018 |
|---|---|---|
| **A. Funding Results** | | |
| 1. Present Value of Future Benefits | $3,486,441,922 | $3,474,101,645 |
| 2. Actuarial Value of Assets | 1,385,992,022 | 1,401,187,212 |
| 3. PV of Future Contributions (1) – (2) | 2,100,449,900 | 2,072,914,433 |
| 4. PV of Future Member Contributions | 241,756,047 | 256,756,964 |
| 5. PV of Future University Contributions (3) – (4) | 1,858,693,853 | 1,816,157,469 |
| 6. PV of Future University Normal Conts. | 8,266,337 | 9,712,156 |
| 7. Unfunded Accrued Liability (5) – (6) | 1,850,427,516 | 1,806,445,313 |
| **B. Annual Contribution Rate (% of payroll)** | | |
| 1.Total | | |
| a. Normal rate (including expenses) | 9.58% | 9.68% |
| b. Unfunded accrued liability | 31.67% | 27.25% |
| c. Sub-total | 41.25% | 36.93% |
| 2. Members | 8.80% | 8.81% |
| 3. University | 32.45% | 28.12% |

## CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITIES (UAAL) DURING PLAN YEAR

| | |
|---|---|
| 1) Beginning of Year: | |
| a) Unfunded Actuarial Accrued Liability | $1,806,445,313 |
| b) Total Normal Cost (including expenses) | 38,438,084 |
| c) Expected Total Contributions based on prior valuation contribution rate with Administrative Expenses | 162,943,641 |
| d) Actual Total Contributions based on contribution rate applicable to current fiscal year | 108,111,563 |
| 2) End of Year: | |
| a) Expected UAAL from previous valuation | $1,800,970,037 |
| [(1a) + (1b)] * 1.0675 – (1c) * 1.03375 | |
| b) Expected UAAL on actual contributions | 1,857,652,698 |
| [(1a) + (1b)] * 1.0675 – (1d) * 1.03375 | |
| c) Increase (Decrease) in UAAL due to deficiency (surplus) | 56,682,661 |
| (2b) – (2a) | |
| 3) Gains (Losses) on Year's Activities | |
| a) Liability – Assumed vs. Actual | $10,046,685 |
| b) Assets – Assumed vs. Actual | (2,821,503) |
| c) Change in Plan Assumptions | 0 |
| d) Change in Plan Provisions | 0 |
| e) Change in Methods | 0 |
| f) Total | $7,225,182 |
| 4) Actual UAAL at End of Year | $1,850,427,516 |
| (2a) + (2c) – (3f) | |

* Expected Total Contributions are based on the Annual Required Contribution (ARC) rate, the average member contribution rate, and annual covered payroll as of the previous valuation date.

## GAINS & LOSSES IN ACTUARIAL ACCRUED LIABILITIES DURING PLAN YEAR

| Type of Activity | Gain (or Loss) |
|---|---|
| **Age & Service Retirements.** If members retire at older ages, there is a gain. If younger ages, a loss. | $(3,248,973) |
| **Disability Retirements.** If disability claims are less than assumed, there is a gain. If more, a loss. | 283,063 |
| **Death-in Service Benefits.** If survivor claims are less than assumed, there is a gain. If more claims, there is a loss. | (552,782) |
| **Withdrawal From Employment.** If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss. | 13,882,988 |
| **Pay Increases.** If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss. | 5,471,766 |
| **New Members.** Additional unfunded accrued liability will produce a loss. | (2,680,575) |
| **Contribution Income.** If more contributions are received than expected, there is a gain. If less, a loss | (56,682,661) |
| **Investment Income.** If there is a greater investment income than assumed, there is a gain. If less income, a loss. | (2,821,503) |
| **Death After Retirement.** If retirees live longer than assumed, there is a loss. If not as long, a gain. | (3,111,088) |
| **Other.** Miscellaneous gains and losses resulting from changes in valuation software, data adjustments, timing of financial transactions, etc. | 2,286 |
| **Gain (or Loss) During Year From Financial Experience** | $(49,457,479) |
| **Non-Recurring Items.** Adjustments for plan amendments, assumptions changes and method changes. | 0 |
| **Composite Gain (or Loss) During Year** | $(49,457,479) |

Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September 2017, Actuarial Standard of Practice Number 51, Assessment and Disclosure of Risk in Measuring Pension Obligations, (ASOP 51) was issued as final with application to measurement dates on or after November 1, 2018. This ASOP, which applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes, is first applicable for the June 30, 2019 actuarial valuation for the System.

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. If the System's assets are depleted, benefits may not be paid which could create legal and litigation risk or the plan could become "pay as you go." The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates.

There are a number of risks inherent in the funding of a defined benefit plan. These include:

- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer to pay and
- external risks such as the regulatory and political environment.

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial contribution rate each year. The System is primarily funded by member and employer contributions to the trust fund, together with the earnings on these accumulated contributions. These contributions fund benefit accruals for current active members and administrative expenses. The remainder of the contributions amortizes the unfunded actuarial accrued liability. The required contribution rate is the sum of the rates for the normal cost for the plan and the amortization of the unfunded actuarial accrued liability. The required contribution rate is sensitive to increases in the UAAL and periods of lower than expected returns would lead to much higher contribution rates as a percentage of payroll.

The other significant risk factor for the System is investment return because of the volatility of returns and the size of plan assets compared to payroll. A perusal of historical returns over 10-20 years reveals that the actual return each year is rarely close to the average return for the same period. This is to be expected, given the underlying capital market assumptions and the Plan's asset allocation. To the extent market rates of interest affect the expected return on assets, there is a risk of change to the discount rate which determines the present value of liabilities and actuarial valuation results.

A key demographic risk for the System is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions reflect a margin for improvement in mortality experience these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, which would also be significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.

## VALUATION BALANCE SHEET
## SHOWING THE PRESENT AND PROSPECTIVE ASSETS AND LIABILITIES
## AS OF JUNE 30, 2019

| PRESENT AND PROSPECTIVE ASSETS | | |
|---|---|---|
| Actuarial Value of Present Assets | | $1,385,992,022 |
| Present Value of Future Member Contributions | | $241,756,047 |
| Present Value of Future Employer Contributions | | |
| Normal Contributions | 8,266,337 | |
| Unfunded Accrued Liability Contributions | $1,850,427,516 | |
| Total Prospective Employer Contributions | | $1,858,693,853 |
| Total Present and Prospective Assets | | $3,486,441,922 |
| **ACTUARIAL LIABILITIES** | | |
| Present Value of Benefits Payable on Account of Retired Members and Survivors of Deceased Members Now Drawing Retirement Benefits | | $2,002,117,433 |
| Present Value of Prospective Benefits Payable on Account of Inactive Members | | $82,955,831 |
| Present Value of Prospective Benefits Payable on Account of Present Active Members: | | |
| Service Retirement Benefits | $1,331,952,171 | |
| Disability Retirement Benefits | $18,290,876 | |
| Death Benefits | $15,054,527 | |
| Separation Benefits | $36,071,084 | |
| Total | | $1,401,368,658 |
| Total Actuarial Liabilities | | $3,486,441,922 |

## SCHEDULE OF FUNDING PROGRESS

| Actuarial Valuation Date | Value of Plan Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded AAL (UAAL) (b – a) | Funded Ratio (a / b) | Covered Payroll (c) | UAAL as a Percentage of Covered Payroll ((b – a) / (c)) |
|---|---|---|---|---|---|---|
| 6/30/2019 | $1,385,992,022 | $3,236,419,538 | $1,850,427,516 | 42.8% | $428,085,691 | 432.3% |
| 6/30/2018 | 1,401,187,212 | 3,207,632,525 | 1,806,445,313 | 43.7 | 453,802,083 | 398.1% |
| 6/30/2017 | 1,371,979,452 | 2,807,476,917 | 1,435,497,465 | 48.9 | 478,529,460 | 300.0% |
| 6/30/2016 | 1,321,209,628 | 2,762,852,807 | 1,441,643,179 | 47.8 | 488,774,924 | 295.0% |
| 6/30/2015 | 1,272,122,896 | 2,728,214,819 | 1,456,091,923 | 46.6 | 500,964,899 | 290.7% |
| 6/30/2014 | 1,179,752,077 | 2,684,515,789 | 1,504,763,712 | 43.9 | 501,190,385 | 300.2% |

## SUMMARY OF ASSUMPTIONS AND METHODS

| | |
|---|---|
| Valuation Date | June 30, 2019 |
| Actuarial Cost Method | Individual Entry Age Normal |
| Amortization Method | Level percent, closed |
| Payroll Growth Rate | 1.50% |
| Asset Valuation Method | 5 Year Smoothed Market |
| Actuarial Assumptions: | |
| Investment rate of return* | 6.75% |
| Projected salary increases* | 2.75% |
| Cost-of-living adjustments | None |
| *Includes inflation at | 2.50% |

**DEVELOPMENT OF THE JUNE 30, 2019 ACTUARIAL VALUE OF ASSETS**

| | Valuation date June 30: | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| A. | Actuarial Value Beginning of Year | $1,179,752,077 | $1,272,122,896 | $1,321,209,628 | $1,371,979,452 | $1,401,187,212 | |
| B. | Market Value End of Year | 1,342,996,273 | 1,332,667,782 | 1,385,629,773 | 1,408,375,956 | 1,403,702,320 | |
| C. | Market Value Beginning of Year | 1,325,364,820 | 1,342,996,273 | 1,332,667,782 | 1,385,629,773 | 1,408,375,956 | |
| | Audit Adjustment | (1,336,437) | (4,549) | 0 | 5,870,247 | 0 | |
| | Adjusted Market Value Beginning of Year | 1,324,028,383 | 1,342,991,724 | 1,332,667,782 | 1,391,500,020 | 1,408,375,956 | |
| D. | Cash Flow | | | | | | |
| | D1. Contributions | 123,844,673 | 116,643,497 | 112,244,122 | 109,223,431 | 108,111,563 | |
| | D2. Benefit Payments | (176,871,770) | (182,614,074) | (188,310,782) | (198,246,775) | (207,822,961) | |
| | D3. Administrative Expenses | (3,377,926) | (3,362,509) | (4,172,828) | (4,457,620) | (3,750,583) | |
| | D4. Investment Expenses | 0 | 0 | 0 | 0 | 0 | |
| | D5. Net | (56,405,023) | (69,333,086) | (80,239,488) | (93,480,964) | (103,461,981) | |
| E. | Investment Income | | | | | | |
| | E1. Market Total: B.-C.-D5. | 74,031,288 | 59,004,595 | 133,201,479 | 116,227,147 | 98,788,346 | |
| | E2. Assumed Rate | 7.75% | 7.75% | 7.75% | 7.75% | 6.75% | |
| | E3. Amount for Immediate Recognition | 100,426,505 | 101,395,202 | 100,172,473 | 104,218,864 | 91,573,535 | |
| | E4. Amount for Phased-In Recognition | (26,395,217) | (42,390,607) | 33,029,006 | 12,008,283 | 7,214,811 | |
| F. | Phased-In Recognition of Investment Income | | | | | | |
| | F1. Current Year: 0.20*E4. | (5,279,043) | (8,478,121) | 6,605,801 | 2,401,657 | 1,442,962 | 0 |
| | F2. First Prior Year | 23,219,566 | (5,279,043) | (8,478,121) | 6,605,801 | 2,401,657 | 1,442,962 |
| | F3. Second Prior Year | 14,768,636 | 23,219,566 | (5,279,043) | (8,478,121) | 6,605,801 | 2,401,657 |
| | F4. Third Prior Year | (7,206,422) | 14,768,636 | 23,219,566 | (5,279,043) | (8,478,121) | 6,605,801 |
| | F5. Fourth Prior Year | 22,846,600 | (7,206,422) | 14,768,636 | 23,219,566 | (5,279,043) | (8,478,121) |
| | F6. Total Recognized Investment Gain | 48,349,337 | 17,024,616 | 30,836,839 | 18,469,860 | (3,306,744) | 1,972,299 |
| G. | Actuarial Value End of Year: | | | | | | |
| | A.+D5.+E3.+F6. | $1,272,122,896 | $1,321,209,628 | $1,371,979,452 | $1,401,187,212 | $1,385,992,022 | |
| H. | Difference Between Market & Actuarial Values | $ 70,873,377 | $ 11,458,154 | $ 13,650,321 | $ 7,188,744 | $ 17,710,299 | $ 15,738,000 |
| I. | Market Value Rate of Return | 5.81% | 4.51% | 10.31% | 8.21% | 7.28% | |
| J. | Actuarial Value Rate of Return | 12.92% [1] | 9.57% [1] | 10.23% [1] | 9.26% [1] | 6.54% [1] | |

[1] Reflects phase-in of 5-year "smoothed" market value of assets.

## SUMMARY OF CHANGES IN NET ASSETS
## FOR THE YEAR ENDING JUNE 30, 2019

| | | |
|---|---|---|
| **Additions for the Year** | | |
| Contributions | | |
| Members | $32,848,638 | |
| University | $75,262,925 | |
| Other | $ 0 | |
| Total | | $108,111,563 |
| Net Investment Income | | $98,788,346 |
| TOTAL | | $206,899,909 |
| **Deductions for the Year** | | |
| Benefit Payments | ($207,822,961) | |
| Administrative Expenses | ($3,750,583) | |
| TOTAL | | ($211,573,544) |
| **Excess of Additions Over Deductions** | | |
| TOTAL | | ($4,673,635) |
| **Reconciliation of Asset Balances** | | |
| Market Value of Assets as of June 30, 2018 | | $1,408,375,956 |
| Audit Adjustment | | $0 |
| Excess of Additions over Deductions | | ($4,673,635) |
| Market Value of Assets as of June 30, 2019* | | $1,403,702,320 |

* The Market Value of Assets shown above is used in the determination of the Actuarial Value of Assets (Schedule B).

**INVESTMENT RATE OF RETURN**: 6.75% per annum, compounded annually (net of investment expenses).

**INFLATION ASSUMPTION**: 2.50% per year.

**PAYROLL GROWTH ASSUMPTION:** 1.50% per year

**ADMINISTRATIVE EXPENSE ASSUMPTION:** Actual prior year expenses

**PERCENT MARRIED**: 80% of employees are assumed to be married, and wives are assumed to be the same age as their husbands.

**ACTUARIAL METHOD**: Individual Entry Age Normal cost method. Actuarial gains and losses are reflected in the unfunded actuarial accrued liability. The unfunded actuarial accrued liability is amortized over a closed 30-year period beginning June 30, 2014. This amortization assumes no future payroll increases. See Schedule E for a detailed explanation.

**DECREMENTS**:

- **PRE-RETIREMENT MORTALITY:** RP-2014 White Collar Headcount-weighted Mortality Table with rates adjusted by 103.8% for males and by 98.2% for females, projected generationally using scale MP-2017.

- **POST-RETIREMENT HEALTHY MORTALITY:** RP-2014 White Collar Headcount-weighted Mortality Table with rates adjusted by 103.8% for males and by 98.2% for females, projected generationally using scale MP-2017.

- **POST-RETIREMENT DISABLED MORTALITY:** RP-2014 Disabled Retiree Mortality Table with rates adjusted by 93.4% for males and by 94.3% for females, projected generationally using scale MP-2017.

- **DISABILITY:** Representative values are presented below (65% of the projected disabilities are assumed to be due to occupational causes).

| Age | Men | Women |
|---|---|---|
| 20 | 0.007% | 0.007% |
| 25 | 0.020% | 0.020% |
| 30 | 0.037% | 0.037% |
| 35 | 0.053% | 0.053% |
| 40 | 0.070% | 0.070% |
| 45 | 0.105% | 0.105% |
| 50 | 0.140% | 0.140% |
| 55 | 0.210% | 0.210% |
| 60 | 0.140% | 0.140% |

- **TERMINATION:** Assumed rates are presented below.

| Years of Service | Rate |
|---|---|
| 0 | 25.0% |
| 1 | 22.0% |
| 2 | 16.0% |
| 3 | 11.5% |
| 4 | 9.0% |
| 5 | 7.0% |
| 6 | 4.5% |
| 7 | 4.0% |
| 8 | 3.5% |
| 9 | 3.0% |
| 10 | 2.5% |
| 11-15 | 2.0% |
| 16+ | 1.0% |

- **RETIREMENT:** Representative values are presented below.

Members with Less than 25 Years of Service as of July 1, 2015:

| Age | Less than 25 Years of Service | 25 Years of Service or More, but Less than 30 | 30 Years of Service | 31 or More Years of Service |
|---|---|---|---|---|
| 45 | | | 9.5% | 9.5% |
| 50 | | | 9.5% | 9.5% |
| 55 | | 5% | 15% | 15% |
| 58 | 5% | 5% | 45% | 25% |
| 60 | 5% | 5% | 45% | 25% |
| 61 | 10% | 10% | 45% | 25% |
| 62 | 11% | 11% | 45% | 25% |
| 63 | 10% | 10% | 45% | 25% |
| 64 | 10% | 10% | 45% | 25% |
| 65 | 20% | 20% | 50% | 30% |
| 66 | 15% | 15% | 50% | 30% |
| 67 | 15% | 15% | 50% | 30% |
| 68 | 15% | 15% | 50% | 30% |
| 69 | 15% | 15% | 50% | 30% |
| 70+ | 100% | 100% | 100% | 100% |

Members with 25 or More Years of Service as of July 1, 2015:

| Age | Less than 25 Years of Service | 25 Years of Service or More, but Less than 30 | 30 or More Years of Service |
|---|---|---|---|
| 45 | | | 9.5% |
| 50 | | | 9.5% |
| 55 | | 5.0% | 42.0% |
| 58 | 5.0% | 5.0% | 32.0% |
| 60 | 5.0% | 5.0% | 26.0% |
| 61 | 9.0% | 9.0% | 20.7% |
| 62 | 9.9% | 9.9% | 25.2% |
| 63 | 9.0% | 9.0% | 25.2% |
| 64 | 9.0% | 9.0% | 25.2% |
| 65 | 18.0% | 18.0% | 25.2% |
| 66 | 13.5% | 13.5% | 27.0% |
| 67 | 13.5% | 13.5% | 27.0% |
| 68 | 13.5% | 13.5% | 27.0% |
| 69 | 13.5% | 13.5% | 27.0% |
| 70+ | 100% | 100% | 100% |

**ASSETS**: The method of valuing assets is intended to recognize a "smoothed" market value of assets. Under this method, the difference between actual return on market value from investment experience and the expected return on market value is recognized over a 5-year period.

**SALARY INCREASES:** 2.75% per annum

1. The valuation is prepared on the projected benefit basis, which is used to determine the present value of each member's expected benefit payable at retirement, disability or death. The calculations are based on the member's age, years of service, sex, compensation, expected future salary increases, and an assumed future interest earnings rate (currently 6.75%). The calculations consider the probability of a member's death or termination of employment prior to becoming eligible for a benefit and the probability of the member terminating with a service, disability, or survivor's benefit. The present value of the expected benefits payable to active members is added to the present value of the expected future payments to current benefit recipients to obtain the present value of all expected benefits payable to the present group of members and survivors.

2. The employer contributions required to support the benefits of the System are determined using the individual entry age normal cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit.

   The portion of the actuarial present value allocated to a valuation year is called the normal cost. The normal cost is calculated for each individual member. The normal cost rate is defined as the total of the individual normal cost divided by the total annual covered payroll.

   The portion of the actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of assets and (b) the actuarial present value of future normal cost is called the Unfunded Actuarial Accrued Liability (UAAL). The UAAL is amortized as a level percentage of the projected salaries of the present and future members of the System, over a 30 year period beginning June 30, 2014 on a closed basis.

**1. Provisions applicable to those members who had completed 20 years of service by July 1, 1979 (Certification 7/7 Supplemented)**

a) Service retirement annuity payable:

i. After 30 years of service; or

ii. At age 58 after 10 years of service; or

iii. At age 55 after 25 years of service.

b) Amount of service retirement annuity:

i. Before age 65 – member with at least 30 years of service: 75% of average compensation if age 55 at beginning date; 65% if under age 55. If member completed 30 years of service before July 1973, annuity is increased by 2% of average compensation for each year of service beyond 30 and before July 1973, but to not more than 85% of average compensation.

ii. Before age 65 – member with less than 30 years of service: 1.50% of average compensation per year of service for member with 20 or fewer years. Percentage increased by 0.05% for each year in excess of 20 years up to a maximum of 1.95% of average compensation per year of service. Amount reduced by ½% for each month member is under age 58 at time annuity begins.

iii. After age 65 – same as before age 65.

iv. Minimum annuity: $250 per month.

v. Average compensation means the average for the highest-paid 36 months of service without limit on compensation.

vi. Employee contributions:

- Complete supplementation: 7.00% of compensation.
- Coordinated: 4.00% up to $4,200 of compensation plus 6.50% of compensation in excess of $4,200.

**2. Provisions applicable to all members who were affected under Certification 37 and who had not completed 20 years of service by July 1, 1979 plus those members who entered the system on or after July 1, 1978 and who did not elect Certification 55 or 94 and did not elect full supplementation under Certification 54 (Certification 37/37 Coordinated)**

a) Service retirement annuity payable:

i. After 30 years of service and age 55; or

ii. At age 58 after 10 years of service; or

iii. At age 55 after 25 years of service.

b) Amount of service retirement annuity:

i. Before age 65 – member with at least 30 years of service: 75% of average compensation. Amount reduced by ½% for each month member is under age 58 at time annuity begins.

ii. Before age 65 – member with less than 30 years of service: 1.50% of average compensation per year of service for member with 20 or fewer years. Percentage increased by 0.05% for each year in excess of 20 years up to a maximum of 1.95% of average compensation per year of service. Amount reduced by ½% for each month member is under age 58 at time annuity begins.

iii. After age 65 – Benefit is coordinated. Annuity is reduced by ½% of average compensation not in excess of the Social Security wage base in effect at retirement for each year of service up to 30 years. If member was under age 58 at beginning date, the coordination adjustment is made before application of ½% reduction per month under 58.

iv. Minimum annuity: $250 per month.

v. Average compensation means the average for the highest-paid 36 months of service, excluding that portion of compensation in any year which is in excess of $35,000.

vi. Employee contributions for coordinated benefit: 5.00% of compensation up to maximum salary of $35,000 for members with 25 or more years of service as of July 1, 2015, and 6.00% of compensation up to maximum salary of $35,000 for members with less than 25 years of service as of July 1, 2015.

**3. Provision applicable to all members who were affected by Certification 37 and who had not completed 20 years of service by July 1, 1979 as well as those members who entered the system on or after July 1, 1978 and later elected Certification 55 or those who elected full supplementation under Certification 54 (but not Certification 94) (Certification 55/55 Coordinated)**

a) Service retirement annuity payable:

i. After 30 years of service; or
ii. At age 58 after 10 years of service; or
iii. At age 55 after 25 years of service.

b) Amount of service retirement annuity:

i. Before age 65 – member with at least 30 years of service: 75% of average compensation. Amount reduced by $^{1}/_{3}$% for each month member is under age 58 at time annuity begins if member had less than 25 years of service as of July 1, 2015 and reduced from age 55 for members with 25 or more years of service as of July 1, 2015.

ii. Before age 65 – member with less than 30 years of service: 1.50% of average compensation per year of service for member with 20 or fewer years. Percentage increased by 0.05% for each year in excess of 20 years up to a maximum of 1.95% of average compensation per year of service. Amount reduced by $^{1}/_{3}$% for each month member is under age 58 at time annuity begins if member had less than 25 years of service as of July 1, 2015 and reduced from age 55 for members with 25 or more years of service as of July 1, 2015.

iii. After age 65 – if member elected full supplementation, annuity is the same as before age 65. Otherwise, annuity is reduced by ½% of average compensation at time of retirement multiplied by years of service up to 30 years.

iv. Minimum annuity: $250 per month.

v. Average compensation means the average for the highest-paid 36 months of service, excluding that portion of compensation in any year which is in excess of $35,000.

vi. Employee contributions:

1. Complete supplementation: 7.00% of compensation up to \$35,000 for members with 25 or more years of service as of July 1, 2015.
2. Complete supplementation: 8.00% of compensation up to \$35,000 for members with less than 25 years of service as of July 1, 2015.
3. Coordinated: For members with 25 or more years of service as of July 1, 2015, 4% up to \$4,200 of compensation plus 6.50% of the excess up to the compensation limit of \$35,000. For members with less than 25 years of service as of July 1, 2015, 5% up to \$4,200 of compensation plus 6.50% of the excess up to the compensation limit of \$35,000.

**4. For those entering between January 1, 1990 and June 30, 1998 who did not elect Certification 94 (Certification 55/55 Supplemented)**

a) Service retirement annuity payable:

i. After 30 years of service; or
ii. At age 58 after 10 years of service; or
iii. At age 55 after 25 years of service.

b) Amount of service retirement annuity:

i. Before age 65 – member with at least 30 years of service: 75% of average compensation. Amount reduced by $^{1}/_{3}$% for each month member is under age 58 at time annuity begins if member had less than 25 years of service as of July 1, 2015 and reduced from age 55 for members with 25 or more years of service as of July 1, 2015.

ii. Before age 65 – member with less than 30 years of service: 1.50% of average compensation per year of service for member with 20 or fewer years. Percentage increased by 0.05% for each year in excess of 20 years up to a maximum of 1.95% of average compensation per year of service. Amount reduced by $^{1}/_{3}$% for each month member is under age 58 at time annuity begins if member had less than 25 years of service as of July 1, 2015 and reduced from age 55 for members with 25 or more years of service as of July 1, 2015.

iii. After age 65 – Same as before age 65.

iv. Minimum annuity: $250 per month.

v. Average compensation means the average for the highest-paid 36 months of service, excluding that portion of compensation in any year which is in excess of $35,000.

vi. Employee contributions:
- All completely supplemented: 8.00% of compensation up to compensation limit of $35,000 for members with 25 or more years of service as of July 1, 2015.
- All completely supplemented: 9.00% of compensation up to compensation limit of $35,000 for members with less than 25 years of service as of July 1, 2015.

**5. Certification 94:**

a) Increase compensation up to $50,000.

b) Those electing coverage under the above certification agree to pay 9.00% of compensation up to $50,000 for members with 25 or more years of service as of July 1, 2015, and 10.00% of compensation up to maximum salary of $50,000 for members with less than 25 years of service as of July 1, 2015.

**6. Certification 139:**

a) Increase compensation up to a $60,000 maximum. The $60,000 cap was increased by 3.00% every two years until 7/1/2014. Effective 7/1/2014, the maximum compensation is frozen at $69,557.

b) Those electing coverage under the above certification agree to pay 11.00% of compensation up to the applicable indexed maximum for members with 25 or more years of service as of July 1, 2015, and 12% of compensation up to the applicable indexed maximum for members with less than 25 years of service as of July 1, 2015 (see (a) above).

c) Effective July 1, 2015, all new employees will be covered under this certification and will pay 12.00% of compensation up to the applicable indexed maximum (see (a) above).

**7. Disability Benefits**

a) A disability retirement annuity is payable upon:

i. Disability due to occupational causes, regardless of service, or

ii. Disability due to non-occupational causes after 15 years of service. If member is also eligible for a service retirement annuity, benefit payable is the higher of the two.

b) Amount of disability retirement annuity:

i. Before age 65 – If service connected, 50% of rate of salary (subject to applicable salary cap) at retirement. If not service connected, 90% of the member's regular retirement benefit payable by the applicable retirement benefit formula above.

ii. After age 65 – Reduced to amount payable by the applicable retirement benefit formula above. However, if post 65 retirement benefit plus Primary Social Security benefit is less than pre 65 disability benefit, then post 65 benefit is adjusted (increased) by the amount necessary to match pre 65 disability benefit.

iii. Minimum annuity: $250 per month.

**8. Vested Benefits**

A member whose employment terminates after ten (10) years of service, and who does not withdraw his contributions, receives a retirement annuity payable beginning at age 60 based on the applicable retirement formula above.

**9. Non-vested Termination Benefits**

If termination of employment occurs prior to completing ten (10) years of service, member is entitled only to a refund of his/her own contributions. Refund of a member's own contributions can also be obtained after attainment of ten (10) years of service but in that event the vested benefit is forfeited.

**10. Pre-retirement Death Benefits**

a) A pre-retirement death benefit is payable upon:

i. A service-connected death, or

ii. A non-service connected death.

b) Amount of pre-retirement death benefit:

i. The widow of a deceased member whose death is service-connected receives an annuity of 50% of final salary (subject to applicable salary cap), plus $10 per month for each child under age 18 (21 if at school) or disabled. If no annuity is paid to widow, $20 per month per eligible child. Widow receives annuity until death or remarriage. Maximum family benefit is 75% of final salary (subject to applicable salary cap).

If there is no surviving widow or eligible children, a lump sum amount equal to the member's contributions plus one year's final salary (subject to applicable salary cap), but not less than $6,000, will be payable to the employee's designated beneficiary.

ii. Should the member's death be non-service connected then a lump sum amount is paid which is equal to the member's contributions plus one year's final salary (subject to applicable salary cap), but not less than $6,000.

**11. Post-retirement Death Benefits**

Member contributions are refunded to the extent that they exceed retirement payments already made, unless a reversionary annuity was elected. Minimum payment is $600. In addition, 50% of retirement annuity is payable to the surviving spouse until death, remarriage, or until the spouse begins to receive Social Security benefits. Minimum annuity, $75 per month; maximum annuity, $150 per month.

**12. Reversionary Annuity**

Member may elect to receive a reduced annuity in order to provide a lifetime benefit after death to a spouse or relative. The benefit to the spouse or relative may be as low as $25 per month or as high as 100% of the member's reduced annuity. This option is not permitted if member retires on a disability annuity.

**13. Christmas Bonus**

A $400 annual bonus is given to all retired participants.

## SCHEDULE OF ACTIVE MEMBER DATA
## AS OF JUNE 30, 2019

| | Completed Years of Service | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Age** | **Under 5** | **5 to 9** | **10 to 14** | **15 to 19** | **20 to 24** | **25 to 29** | **30+** | **Total** | **Payroll** |
| Under 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 to 24 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 788,189 |
| 25 to 29 | 290 | 29 | 1 | 0 | 0 | 0 | 0 | 320 | 5,601,928 |
| 30 to 34 | 261 | 179 | 25 | 1 | 0 | 0 | 0 | 466 | 12,544,068 |
| 35 to 39 | 231 | 190 | 216 | 114 | 1 | 0 | 0 | 752 | 25,974,123 |
| 40 to 44 | 161 | 182 | 289 | 419 | 125 | 2 | 0 | 1,178 | 45,806,735 |
| 45 to 49 | 147 | 115 | 229 | 355 | 467 | 93 | 1 | 1,407 | 61,837,143 |
| 50 to 54 | 106 | 83 | 178 | 345 | 448 | 344 | 85 | 1,589 | 76,997,632 |
| 55 to 59 | 52 | 62 | 141 | 241 | 387 | 350 | 281 | 1,514 | 78,913,550 |
| 60 to 64 | 25 | 34 | 80 | 148 | 201 | 224 | 291 | 1,003 | 60,008,457 |
| 65 to 69 | 14 | 18 | 31 | 54 | 91 | 88 | 247 | 543 | 36,565,947 |
| 70+ | 4 | 3 | 18 | 30 | 28 | 33 | 201 | 317 | 23,047,918 |
| Total | 1,342 | 895 | 1,208 | 1,707 | 1,748 | 1,134 | 1,106 | 9,140 | 428,085,691 |

**Average Active Age:** **50.2**

**Average Service:** **17.9**

## DISTRIBUTION OF ACTIVE PARTICIPANTS BY PENSION ELIGIBILITY, CONTRIBUTORY MAXIMUM, AND PLAN TYPE

| Pension Eligibility Certification | Contributory Maximum Certification | Employee Contribution Wage Base | Plan Type | Participant Count @ 6/30/2019 | Participant Count @ 6/30/2018 |
|---|---|---|---|---|---|
| Cert. #7 | Cert. #7 | None | Coordinated | - | - |
| Cert. #55 | Cert. #55 | $35,000 | Coordinated | 30 | 42 |
| Cert. #37 | Cert. #37 | $35,000 | Coordinated | 445 | 557 |
| Cert. #55 | Cert. #55 | $35,000 | Supplemented | 1,714 | 1,888 |
| Cert. #7 | Cert. #7 | None | Supplemented | 2 | 3 |
| Cert. #37 | Cert. #94 | $50,000 | Coordinated | 49 | 58 |
| Cert. #55 | Cert. #94 | $50,000 | Supplemented | 3,851 | 4,131 |
| Cert. #55 | Cert. #94 | $50,000 | Coordinated | 16 | 27 |
| Cert. #37 | Cert. #139* | $69,557 | Coordinated | 53 | 66 |
| Cert. #55 | Cert. #139* | $69,557 | Coordinated | 9 | 13 |
| Cert. #55 | Cert. #139* | $69,557 | Supplemented | 2,971 | 2,850 |
| | | | | 9,140 | 9,635 |

*Effective 7/1/2014, the Certification 139 contribution wage base is frozen at $69,557.

## DATA RECONCILIATION
## AS OF JUNE 30, 2019

| | Active | Terminated Vested | Receiving Benefits | Total |
|---|---|---|---|---|
| **1. Number of Participants as of June 30, 2018** | **9,635** | **469** | **8,816** | **18,920** |
| **2. Change in status during the plan year:** | | | | |
| a. Active to inactive | (559) | 259 | | (300) |
| b. Active to retiree | (449) | | 449 | |
| c. Inactive to active | 94 | (19) | | 75 |
| d. Inactive to retired | | (45) | 45 | |
| e. Retired to active | | | | |
| **3. No longer participating due to:** | | | | |
| a. Death | (4) | (7) | (205) | (216) |
| b. Termination / Refund | (5) | (34) | (13) | (52) |
| c. Deletion of duplicate data | | | | |
| d. Data adjustment | | (34) | | (34) |
| **4. New participant due to:** | | | | |
| a. Initial participation | 428 | | | 428 |
| b. Omitted in error last year | | | | |
| c. Pickups and Corrections | | 2 | 1 | 3 |
| d. New beneficiaries | | | 3 | 3 |
| **5. Number of Participants as of June 30, 2019** | **9,140** | **591** | **9,096** | **18,827** |

## ESTIMATED PROJECTED BENEFIT PAYMENTS*

| Year End | Current In-Pay | Current Not-In-Pay | Total |
|---|---|---|---|
| 2019 | $209,529,420 | $17,422,726 | $226,952,146 |
| 2020 | 204,508,809 | 28,837,323 | 233,346,132 |
| 2021 | 199,509,021 | 38,624,667 | 238,133,688 |
| 2022 | 194,389,670 | 47,686,815 | 242,076,485 |
| 2023 | 189,202,747 | 56,297,504 | 245,500,251 |
| 2024 | 184,241,131 | 64,045,312 | 248,286,443 |
| 2025 | 178,953,002 | 71,841,036 | 250,794,038 |
| 2026 | 173,370,367 | 79,980,645 | 253,351,012 |
| 2027 | 167,744,052 | 88,067,756 | 255,811,808 |
| 2028 | 162,080,249 | 95,612,133 | 257,692,382 |
| 2029 | 156,251,061 | 103,119,839 | 259,370,900 |
| 2030 | 150,286,370 | 110,601,393 | 260,887,763 |
| 2031 | 144,232,674 | 117,983,221 | 262,215,895 |
| 2032 | 138,098,645 | 124,967,539 | 263,066,184 |
| 2033 | 131,858,445 | 131,373,366 | 263,231,811 |
| 2034 | 125,647,726 | 137,336,726 | 262,984,452 |
| 2035 | 119,315,618 | 142,788,942 | 262,104,560 |
| 2036 | 112,950,299 | 147,576,989 | 260,527,288 |
| 2037 | 106,594,285 | 151,791,343 | 258,385,628 |
| 2038 | 100,184,337 | 155,251,299 | 255,435,636 |
| 2039 | 93,764,003 | 157,859,514 | 251,623,517 |
| 2040 | 87,395,133 | 159,412,315 | 246,807,448 |
| 2041 | 81,067,486 | 160,316,896 | 241,384,382 |
| 2042 | 74,836,328 | 160,722,808 | 235,559,136 |
| 2043 | 68,724,860 | 160,679,829 | 229,404,689 |

*Amounts shown are the cash flows for current members only, based on the current benefit structure and assuming that all actuarial assumptions are met each year. To the extent that actual experience deviates from that expected, results will vary. Amounts are shown in future nominal dollars and have not been discounted to the valuation date. Does not include refunds to current non-vested inactive members.