# Michigan Public School Employees' Retiree Health Benefits

## Annual Actuarial Valuation Report as of September 30, 2020

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March 12, 2021

Mr. Anthony Estell
Director, Office of Retirement Services
530 W. Allegan
Lansing, Michigan 48933

Dear Mr. Estell:

Submitted in this report are the results of an actuarial valuation of the assets and liabilities associated with the defined benefit portion of the employer financed retiree health benefits provided to Michigan public school employees by the Michigan Public School Employees' Retirement System (MPSERS). The date of the valuation was September 30, 2020. The actuarially computed employer contribution has been calculated for the fiscal year beginning October 1, 2022.

This report was prepared at the request of the Office of Retirement Services (ORS) and those designated or approved by the Office of Retirement Services. This report may be provided to parties other than the Office of Retirement Services only in its entirety and only with the permission of the Office of Retirement Services. GRS is not responsible for unauthorized use of this report.

The purpose of the valuation was to measure the System's funding progress, determine the actuarially computed employer contribution for the 2022-2023 fiscal year and to provide actuarial information for the System's financial report. This report should not be relied on for any other purpose.

The valuation was based upon information furnished by the Office of Retirement Services, concerning retiree health benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We are not responsible for the accuracy or completeness of the information provided by the Office of Retirement Services.

Future actuarial measurements may differ significantly from those presented in this report due to such factors as experience differing from that anticipated by actuarial assumptions, changes in plan provisions, actuarial assumptions/methods or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. This valuation was based on the assumption that the plan sponsor will continue to be able to make any contribution necessary to fund the plan in the future. A determination of the plan sponsor's ability to make the necessary contributions in the future is beyond the scope of our expertise and was not performed by us.

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This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the Plan as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Mita D. Drazilov and Louise M. Gates are Members of the American Academy of Actuaries (MAAA), are independent of the plan sponsor and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

Mita Drazilov

Mita D. Drazilov, ASA, FCA, MAAA

Louise Gates

Louise M. Gates, ASA, FCA, MAAA

MDD/LMG:sc

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# Executive Summary/Board Summary

# Executive Summary/Board Summary

## Actuarially Computed Employer Contribution

It was reported that full funding of the retiree health benefit program began in fiscal year 2013. It was also reported that the September 30, 2020 annual actuarial valuation is used to establish the employer contribution for fiscal year 2023. Therefore, this report presents the actuarially computed employer contribution for fiscal year 2023 (based upon a 6.95% investment return assumption). Plan changes resulting from Public Act 300 of 2012 are reflected in this valuation. (They were first reflected in the September 30, 2012 valuation.) A brief summary of the plan changes follows:

(1) 90% employer subsidy for benefit recipients already Medicare eligible as of January 1, 2013
(2) 80% employer subsidy for other members not covered by a grading provision
(3) 80% maximum employer subsidy for members covered by a grading provision
(4) Members hired prior to September 4, 2012 had the option to elect to forfeit employer subsidized retiree health coverage and participate in the Personal Healthcare Fund (PHF)
(5) Members hired on or after September 4, 2012 participate in the PHF with defined benefit retiree health coverage essentially limited to a lump sum payment at termination ($1,000 or $2,000 depending on age at termination), except in cases of duty death-in-service

In addition to the above changes, future 3% of payroll active member contributions required to participate in the defined benefit retiree health program have been reflected in this valuation. A potential refund of a member's 3% contributions is assumed to occur from the pension portion of the Retirement System.

The actuarially computed employer contribution for fiscal year 2023 was determined to be $285,611,942.

The actuarially computed employer contribution for the fiscal year beginning October 1, 2022, has been calculated using a 6.95% investment return assumption. Below is a summary of the actuarially computed employer contributions for the 2022 and the 2023 fiscal years. The use of a 6.95% investment return assumption in this valuation of the plan is based upon the full funding of the retiree health benefit program in conjunction with the Dedicated Gains Policy.

| Actuarially Computed Employer Contribution | Full Funding ( 6.95% Interest) |
|---|---|
| Fiscal Year Beginning 10/1/2022 | $285,611,942 |
| Fiscal Year Beginning 10/1/2021 | 492,457,837 |

For additional details please see Section A of the report. Please note, the actuarially computed employer contribution shown in this report does not reflect any contribution floors as described in Public Act 92 of 2017 and Public Act 181 of 2018 and is in addition to any reconciliation payments as required by subsection 41(9) of MPSERS statute.

# Executive Summary/Board Summary

## Liabilities and Assets

The present value of all benefits expected to be paid to current plan members, as of September 30, 2020, is $13.4 billion. The actuarial accrued liability, which is the portion of the $13.4 billion attributable to service accrued by plan members as of September 30, 2020, is $11.9 billion. As of September 30, 2020, there is $8.2 billion in valuation assets available to offset the liabilities of the plan.

The funded status of the plan, which is the ratio of plan assets to actuarial accrued liabilities as of September 30, 2020, is 68.8%.

## Comparison with Prior Year Valuation

The actuarial accrued liability decreased from $13.0 billion to $11.9 billion, while the actuarially computed employer contribution decreased from $492.5 million to $285.6 million.

The medical and prescription drug trend rates used in the valuation were changed to better reflect anticipated future experience. The change in medical and drug trend rates decreased the Actuarial Accrued Liability by $223.8 million and decreased the actuarially computed employer contribution by $17.3 million.

In accordance with Public Act 181 of 2018, the payroll growth assumption for amortization purposes used in determining the fiscal year 2023 employer contributions decreased from 3.00% to 2.50%. While this assumption change had no impact on the Actuarial Accrued Liability, it increased the actuarially computed employer contribution by $7.7 million.

In addition, there was an overall actuarial gain (i.e., favorable plan experience) during the fiscal year ending September 30, 2020. The primary source of this actuarial gain was that the employer subsidized October 1, 2020 per person health benefit costs were lower than projected by the 2019 valuation assumptions. The lower-than-projected per person health benefit costs decreased the Actuarial Accrued Liability by $1.3 billion and decreased the actuarially computed employer contribution by $139.3 million. Actual fiscal year 2020 employer paid benefits were, to a lesser extent, an additional source of favorable experience gains slightly offset by unfavorable investment experience.

## Dedicated Gains Policy

In 2017, the Board adopted a Dedicated Gains Policy. The purpose of the Policy is to reduce the investment return assumption for actuarial valuation purposes if the fiscal year's market value rate of return exceeds a certain amount. The immediate recognition of the market value return is expected to offset the increase in the actuarially computed employer contribution from where it otherwise would have been. In accordance with direction provided by ORS, due to the normal cost floor provision for MPSERS, the amount of excess investment return for MPSERS does not cover the increase in the first year employer normal cost contribution.

For fiscal year 2020, the actual return on the market value of assets was not high enough to trigger the provisions of the Dedicated Gains Policy. Therefore, for the September 30, 2020 valuation, the investment return assumption remained 6.95%. Please see page D-3 for additional detail.

# SECTION A

## VALUATION RESULTS

# Development of the Actuarially Computed Employer Contribution

| Contributions for | Fiscal Year Beginning October 1, 2022 | |
|---|---|---|
| | **6.95% Interest** | |
| | | **Total** |
| Employer Normal Cost | $ | 44,781,185 |
| Amortization of UAAL [1] | $ | 240,830,757 |
| Actuarially Computed Employer Contribution | $ | 285,611,942 |
| | **Fiscal Year Beginning October 1, 2021** | |
| | **6.95% Interest** | |
| | | **Total** |
| Employer Normal Cost | $ | 51,876,949 |
| Amortization of UAAL [1] | $ | 440,580,888 |
| Actuarially Computed Employer Contribution | $ | 492,457,837 |

[1] *Unfunded Actuarial Accrued Liabilities (UAAL) were amortized over 16 years from October 1, 2022 (17 years in the 2019 valuation from October 1, 2021).*

The UAAL was amortized as a level percent of active member payroll over a period of 16 years and a payroll growth assumption (for amortization purposes only) of 2.50%. The actuarially computed employer contribution amounts presented throughout this report do not reflect the normal cost or UAAL "floor" provisions of Public Act 92 of 2017 and Public Act 181 of 2018 and are in addition to any reconciliation payments as required by subsection 41(9) of MPSERS statute.

# Determination of Unfunded Actuarial Accrued Liability

| | September 30, 2020 | | |
|---|---|---|---|
| | 6.95% Interest | | |
| | Gross Prior to Payments From Medicare | Offset for Payments From Medicare | Total |
| A. Present Value of Future Benefits | | | |
| i) Retirees and Beneficiaries | $ 42,384,052,834 | $ (35,489,254,894) | $ 6,894,797,940 |
| ii) Inactive Vested Members | 502,572,600 | (435,176,051) | 67,396,549 |
| iii) Active Members | 23,738,473,134 | (17,264,289,686) | 6,474,183,448 |
| Total Present Value of Future Benefits | $ 66,625,098,568 | $ (53,188,720,631) | $ 13,436,377,937 |
| B. Present Value of Future Normal Costs | 5,709,895,469 | $ (4,158,404,873) | 1,551,490,596 |
| C. Actuarial Accrued Liabilities (A-B) | $ 60,915,203,099 | $ (49,030,315,758) | $ 11,884,887,341 |
| D. Actuarial Value of Assets | 8,178,804,782 | | 8,178,804,782 |
| E. Unfunded Actuarial Accrued Liability (C-D) | $ 52,736,398,317 | $ (49,030,315,758) | $ 3,706,082,559 |
| F. Funded Ratio (D/C) | | | 68.82% |

| | September 30, 2019 | | |
|---|---|---|---|
| | 6.95% Interest | | |
| | Gross Prior to Payments From Medicare | Offset for Payments From Medicare | Total |
| A. Present Value of Future Benefits | | | |
| i) Retirees and Beneficiaries | $ 45,256,778,636 | $ (37,415,386,175) | $ 7,841,392,461 |
| ii) Inactive Vested Members | 588,366,949 | (511,675,272) | 76,691,677 |
| iii) Active Members | 26,189,688,584 | (19,443,278,301) | 6,746,410,283 |
| Total Present Value of Future Benefits | $ 72,034,834,169 | $ (57,370,339,748) | $ 14,664,494,421 |
| B. Present Value of Future Normal Costs | 6,444,496,233 | $ (4,789,660,477) | 1,654,835,756 |
| C. Actuarial Accrued Liabilities (A-B) | $ 65,590,337,936 | $ (52,580,679,271) | $ 13,009,658,665 |
| D. Actuarial Value of Assets | 6,957,871,742 | | 6,957,871,742 |
| E. Unfunded Actuarial Accrued Liability (C-D) | $ 58,632,466,194 | $ (52,580,679,271) | $ 6,051,786,923 |
| F. Funded Ratio (D/C) | | | 53.48% |

# Experience Gain/(Loss)

**Gains/(Losses) During the Year Ended September 30, 2020**
**Resulting from Differences Between Assumed and Actual Experience**

| | |
|---|---|
| A. Derivation of Actuarial Gain/(Loss): | |
| 1. Unfunded Actuarial Accrued Liability (UAAL) - Previous Valuation | $ 6,051,786,923 |
| 2. Total Normal Cost (employer plus member) for Year Ending 9/30/2020 | 223,454,367 |
| 3. Total Contributions (employer plus member) for Year Ending 9/30/2020 | 913,261,138 |
| 4. Interest on: | |
| a. UAAL: Discount Rate* x (1) | 420,599,191 |
| b. Normal Cost and Contributions: Discount Rate / 2 x [(2) - (3)] | (23,970,785) |
| c. Net Total: (a) + (b) | 396,628,406 |
| 5. Change in UAAL due to Benefit Changes | - |
| 6. Change in UAAL due to Assumptions (Trend) | (223,759,195) |
| 7. Expected UAAL Current Year: (1) + (2) - (3) + (4c) + (5) + (6) | 5,534,849,363 |
| 8. Actual UAAL Current Year | 3,706,082,559 |
| 9. Experience Gain/(Loss): (7) - (8) | 1,828,766,804 |
| B. Approximate Portion of Gain/(Loss) due to Investments | (42,355,566) |
| C. Approximate Portion of Gain/(Loss) due to Liabilities: (A.9) - (B) | 1,871,122,370 |

** Discount rate is 6.95%.*

Please note that row B above includes the accelerated recognition of investment gains associated with the Dedicated Gains Policy, if applicable.

**Type of Activity**

| | Gain/(Loss) |
|---|---|
| 1. **Premiums.** Gains and losses resulting from actual premiums in valuation year versus that assumed from prior valuation. | $ 1,302,843,921 |
| 2. **Investment Income.** If there is greater investment income than assumed, there is a gain. If less income, a loss. | (42,355,566) |
| 3. **Demographic and Other.** Gains and losses resulting from demographic experience, data adjustments, timing of financial transactions, etc. | 568,278,449 |
| 4. **Composite Gain/(Loss) During Year.** | $ 1,828,766,804 |

# Comments

**Comment A:** It was reported that full funding of the retiree health benefit program began in fiscal year 2013. It was also reported that the September 30, 2020 annual actuarial valuation is used to establish the employer contribution for fiscal year 2023. Therefore, this report presents the actuarially computed employer contribution for fiscal year 2023 (based upon a 6.95% discount rate). Plan changes resulting from Public Act 300 of 2012 are reflected in this valuation. (They were first reflected in the September 30, 2012 valuation.) A brief summary of the plan changes follows:

(1) 90% employer subsidy for benefit recipients already Medicare eligible as of January 1, 2013
(2) 80% employer subsidy for other members not covered by a grading provision
(3) 80% maximum employer subsidy for members covered by a grading provision
(4) Members hired prior to September 4, 2012 had the option to elect to forfeit employer subsidized retiree health coverage and participate in the Personal Healthcare Fund (PHF)
(5) Members hired on or after September 4, 2012 participate in the PHF with defined benefit retiree health coverage essentially limited to a lump sum payment at termination ($1,000 or $2,000 depending on age at termination), except in cases of duty death-in-service

In addition to the above changes, future 3% of payroll active member contributions required to participate in the defined benefit retiree health program have been reflected in this valuation. A potential refund of a member's 3% contributions is assumed to occur from the pension portion of the Retirement System.

The actuarially computed employer contribution for fiscal year 2023 was determined to be $285,611,942. Please note, the actuarially computed employer contribution shown in this report does not reflect any contribution floors as described in Public Act 92 of 2017 and Public Act 181 of 2018 and is in addition to any reconciliation payments as required by subsection 41(9) of MPSERS statute.

**Comment B:** One of the key assumptions used in any valuation of the cost of post-employment benefits is the investment rate of return on Plan assets. Higher assumed investment returns will result in a lower actuarially computed employer contribution. Lower returns will tend to increase the actuarially computed employer contributions. We have calculated the liability and the resulting actuarially computed employer contribution based on a 6.95% assumed rate of return, and based on the employer's funding policy of contributing the full actuarially computed employer contribution into a qualified trust.

For fiscal year 2020, the actual return on the market value of assets was not high enough to trigger the provisions of the Dedicated Gains Policy. Therefore, for the September 30, 2020 valuation, the investment return assumption remained 6.95%.

**Comment C:** Starting with the September 30, 2018 valuation, the actuarial value of assets was developed using an asset smoothing method. The actuarial value of assets recognizes assumed investment return fully each year. Differences between actual and assumed investment return are phased-in over a closed 5-year period. Prior to the September 30, 2018 valuation, the actuarial value of assets was equal to the market value of assets. The market value of assets as of September 30, 2020 was $8,019.0 million, while the actuarial value of assets as of September 30, 2020 was $8,178.8 million.

# Comments

**Comment D:** Because retiree health benefits are not related to active member payroll, full funding employer contributions are reported as a dollar amount, instead of expressed as a percentage of payroll. Some readers, however, are interested in the actuarially computed employer contributions expressed as a percentage of payroll. The non-PHF active member payroll is projected to be $6,134.4 million for the year beginning October 1, 2022, and the PHF active member payroll is projected to be $3,307.3 million for the year beginning October 1, 2022. With the introduction of the PHF, the employer normal cost percent (i.e., 0.73%) is expressed as a percentage of non-PHF active member payroll, while the UAAL percent (i.e., 2.55%) is expressed as a percentage of total payroll (i.e., including both non-PHF and PHF active member payroll) based on current administrative practice. The actuarially computed employer contribution amounts expressed as percentages of payroll do not reflect the normal cost or UAAL "floor" provisions of Public Act 92 of 2017 and Public Act 181 of 2018 and is in addition to any reconciliation payments as required by subsection 41(9) of the MPSERS statute.

**Comment E:** The fiscal year 2023 employer contribution rate shown includes the amortization of the unfunded actuarial accrued liability over 16 years, beginning October 1, 2022. A shorter amortization period would result in a higher actuarially computed employer contribution.

**Comment F:** The employer subsidized October 1, 2020 per person health benefit costs were lower than projected by the 2019 valuation assumptions. The lower actual increases from 2019 to 2020 resulted in a lower-than-projected actuarially computed employer contribution and accrued liability.

**Comment G:** Beginning with the September 30, 2019 valuation, it was reported to the actuary that a reconciliation process, similar to that used for the pension valuation, had been implemented with respect to the employer retiree health contributions, with reconciliation payments beginning in fiscal year 2021. The contribution requirements shown on page A-1 are in addition to any reconciliation payments as required by subsection 41(9) of the MPSERS statute. The scheduled reconciliation payments were prepared and reported by the Office of Retirement Services (ORS) and are presented on page F-13.

**Comment H:** In accordance with Public Act 181 of 2018, the payroll growth assumption for amortization purposes used in determining the fiscal year 2023 employer contributions decreased from 3.00% to 2.50%. While this assumption change had no impact on the Actuarial Accrued Liability, it increased the actuarially computed employer contribution by $7.7 million.

**Comment I:** It is our understanding that the plan is participating in the Medicare Advantage program for calendar year 2021. The September 30, 2020 actuarial valuation was completed under the assumption that the plan will participate in the Medicare Advantage program for each year following the valuation date.

**Comment J:** In a Medicare Advantage program, the liability is based on the difference between the present value of future claims minus the present value of future Medicare reimbursements. For purposes of this valuation, future growth in Medicare reimbursements was assumed to be equal to future growth in post-65 medical and prescription drugs claims.

# Comments

**Comment K:** Future trends in health costs defy accurate prediction. To the extent that future costs increase more (or less) than projected in this report, the computed liabilities and the actuarially computed employer contributions will be higher (or lower) than shown in this report.

**Comment L:** Governmental Accounting Standards Board (GASB) Statement No. 74 was effective for the plan year ending September 30, 2017. A separate report was issued to comply with the actuarial requirements of this Statement.

**Comment M:** Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regards to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations. In addition, the measurement is inappropriate for assessing benefit security for the membership.
(2) The measurement is dependent upon the actuarial cost method, which, in combination with the plan's amortization policy and asset valuation method, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

# SECTION B

## RETIREE PREMIUM RATE DEVELOPMENT

# Retiree Premium Rate Development

## Background

The System's eligible retirees and their dependents may elect to receive benefits from a number of health care plans, including the self-funded Blue Cross Blue Shield of Michigan (BCBSM) PPO plan for Non-Medicare retirees, the BCBSM Medicare Advantage Plan for Medicare retirees and the OPTUMRx prescription drug plan, and the fully-insured HMO plans from Blue Care Network (BCN), and Priority Health. For the MESSA retirees, a fully-insured BCBSM plan is provided. Dental benefits are self-funded, provided by Delta Dental. Vision benefits are self-funded, provided by BCBSM under a Blue Vision / VSP platform.

## Rate Development

For the fully-insured programs, initial per capita costs were developed separately for pre-65 and post-65 retirees using the January 1, 2021 premium rates provided by the System.

For the self-funded programs, calendar year premium rates are developed by an independent actuarial firm using the self-funded medical and Rx claims experience for a recent twelve month period in conjunction with exposure data for retired members of the health care program and administrative expenses, CMS reimbursements (Medicare offset payments) and Prescription Drug Plan (PDP) reimbursements.

These self-insured rates are evaluated for suitableness in the valuation process using the claim and administrative expenses, reimbursements from CMS and PDP provided by the independent actuarial firm. The rates are adjusted slightly for differences in expected trend levels between the independent actuarial firm and GRS, from the claim period to the rating period.

These self-insured, calendar year premium rates are projected to the valuation period (i.e., October 1, 2020 to September 30, 2021), adjusted for plan design changes and then blended with the fully-insured rates, based on actual enrollment. A dependent load of 8.7% was added to pre-65 spousal rates to account for retirees with dependent coverage.

Age graded and gender distinct premiums and Medicare offset payments are utilized by this valuation. The initial costs developed are appropriate for the unique age and gender distribution currently existing. Over the future years covered by this valuation, the age and gender distribution will most likely change. Therefore, our process "distributes" the average premium over all age/gender combinations and assigns a unique premium for each combination. This process more accurately reflects health care costs in the retired population over the projection period.

In a Medicare Advantage Program, the liability is based on the difference between the present value of future claims minus the present value of future reimbursements from CMS. CMS' reimbursement is based on a very competitive bid process and has resulted in recent Medicare Advantage premiums trending at low rates of increase. Traditionally, a margin has been added to Medicare Advantage rates to recognize that increases in CMS reimbursements may lag behind the trends for healthcare costs. For the near term, we believe this margin is no longer necessary and we will monitor the Medicare Advantage environment and revisit the need for an additional margin at the time of the next valuation.

# Retiree Premium Rate Development

The tables below show a subset of the resulting one-person combined gross medical and prescription drug monthly premiums (employer paid subsidy plus member paid subsidy), as well as the Medicare Payments (Medicare Advantage Plan and Prescription Drug Plan) offset at select ages. The premium (or per capita cost) rates shown below reflect the use of age grading.

### Monthly One-Person Rates
### For Medical and Prescription Drug Coverage

| Per Capita Costs for Retirees Not Eligible for Medicare | | | | |
|---|---|---|---|---|
| | Gross Medical and Prescription Drug | | Medicare Payments Offset (MA and PDP) | |
| Age | Male | Female | Male | Female |
| 50 | $ 484.22 | $ 596.51 | N/A | N/A |
| 60 | 822.95 | 810.32 | N/A | N/A |
| 64 | 1,000.73 | 944.42 | N/A | N/A |

| Per Capita Costs for Retirees Eligible for Medicare | | | | |
|---|---|---|---|---|
| | Gross Medical and Prescription Drug | | Medicare Payments Offset (MA and PDP) | |
| Age | Male | Female | Male | Female |
| 65 | $ 1,042.47 | $ 983.25 | $ 901.39 | $ 850.19 |
| 75 | 1,219.68 | 1,190.14 | 1,054.62 | 1,029.07 |
| 85 | 1,289.74 | 1,304.93 | 1,115.19 | 1,128.33 |

| Per Capita Costs for Beneficiaries Not Eligible for Medicare | | | | |
|---|---|---|---|---|
| | Gross Medical and Prescription Drug | | Medicare Payments Offset (MA and PDP) | |
| Age | Male | Female | Male | Female |
| 50 | $ 451.05 | $ 555.65 | N/A | N/A |
| 60 | 766.57 | 754.81 | N/A | N/A |
| 64 | 932.17 | 879.72 | N/A | N/A |

| Per Capita Costs for Beneficiaries Eligible for Medicare | | | | |
|---|---|---|---|---|
| | Gross Medical and Prescription Drug | | Medicare Payments Offset (MA and PDP) | |
| Age | Male | Female | Male | Female |
| 65 | $ 962.37 | $ 907.70 | $ 832.13 | $ 784.86 |
| 75 | 1,125.97 | 1,098.69 | 973.58 | 950.00 |
| 85 | 1,190.64 | 1,204.66 | 1,029.51 | 1,041.63 |

The dental and vision premium rates used in this valuation of the Plan were not “age graded” since these claims do not vary significantly by age. The gross monthly one and two person combined dental/vision premiums used in this valuation are $30.25 and $60.50, respectively.

# Retiree Premium Rate Development

## Health Care Cost Trend Assumption

The health care cost trend rate is the rate of change in per capita health care claims over time as a result of factors such as medical inflation, utilization of health care services, plan design, and technological improvements. It is a crucial economic assumption that is required for measuring retiree health care benefit obligations.

Retiree health care valuations use a health care cost trend assumption (trend vector) that changes over the years. The trend vector used in this valuation begins with a near-term trend assumption and declines over a time to an ultimate trend rate. The near-term rates reflect the increases in the current cost of health care goods and services. The process of trending down to a lower ultimate trend relies on the theory that premiums will moderate over the long-term otherwise the healthcare sector would eventually consume the entire GDP. It is on this basis that we project premium rate increases will continue to exceed wage inflation for the next fifteen years, but by less each year until leveling off at a rate assumed to be 3.50% in this valuation.

While experience is often the best starting point for future costs, GRS does not rely on a group's experience in setting the near-term trend assumptions since trends vary significantly from year to year and are not credible for most groups. Therefore, professional judgment, trends from GRS's book of business and industry benchmarks (e.g., trend reports from various Pharmacy Benefit Management (PBM) organizations and national healthcare benefit consulting firms) are used in conjunction with a group's historical experience to establish the trend assumptions.

## Actuarial Disclosures

The premium rates used in this valuation were developed using the proprietary Excel models which in James E. Pranschke's professional judgment provide the initial projected costs which are consistent with the purposes of the valuation.  We performed tests to ensure that the models, in their entirety, reasonably represent that which is intended to be modeled.

Aging factors used in the premium development models were developed based on the information and data from a 2013 study commissioned by the Society of Actuaries entitled "Health Care Costs – From Birth to Death."

James E. Pranschke is a Member of the American Academy of Actuaries (MAAA) and meets the Qualification Standards of the American Academy of Actuaries to certify the per capita retiree health care rates (shown on pages B-2, B-4, and B-5) and the health care trend rates (shown on page F-11).

James E. Pranschke

James E. Pranschke, FSA, FCA, MAAA

# Retiree Premium Rate Development

**Gross Monthly One-Person Retiree Rates for Medical and Prescription Drug Coverage**

| Age | Gross Rate Male | Gross Rate Female | Age | Gross Rate Male | Gross Rate Female | Age | Gross Rate Male | Gross Rate Female |
|---|---|---|---|---|---|---|---|---|
| 16 | $ 216.22 | $ 217.88 | 51 | $ 512.35 | $ 617.15 | 86 | $1,284.98 | $1,309.61 |
| 17 | 214.71 | 227.90 | 52 | 541.64 | 637.40 | 87 | 1,279.74 | 1,313.06 |
| 18 | 208.02 | 234.43 | 53 | 572.13 | 657.10 | 88 | 1,274.60 | 1,315.71 |
| 19 | 197.45 | 238.51 | 54 | 603.95 | 676.42 | 89 | 1,269.93 | 1,317.55 |
| 20 | 185.20 | 242.35 | 55 | 637.18 | 695.70 | 90 | 1,265.84 | 1,318.00 |
| 21 | 173.54 | 248.47 | 56 | 671.81 | 715.47 | 91 | 1,262.27 | 1,316.16 |
| 22 | 164.16 | 258.87 | 57 | 707.81 | 736.30 | 92 | 1,259.01 | 1,310.94 |
| 23 | 158.11 | 274.53 | 58 | 745.00 | 758.77 | 93 | 1,255.79 | 1,301.31 |
| 24 | 155.73 | 295.41 | 59 | 783.32 | 783.32 | 94 | 1,252.30 | 1,286.29 |
| 25 | 156.79 | 320.54 | 60 | 822.95 | 810.32 | 95 | 1,248.29 | 1,265.11 |
| 26 | 160.74 | 348.38 | 61 | 864.28 | 839.97 | 96 | 1,243.58 | 1,237.15 |
| 27 | 166.86 | 377.12 | 62 | 907.59 | 872.30 | 97 | 1,238.06 | 1,202.05 |
| 28 | 174.45 | 404.95 | 63 | 953.06 | 907.16 | 98 | 1,231.70 | 1,159.69 |
| 29 | 182.97 | 430.26 | 64 | 1,000.73 | 944.42 | 99 | 1,231.70 | 1,159.69 |
| 30 | 191.99 | 451.79 | 65 | 1,042.47 | 983.25 | 100 | 1,231.70 | 1,159.69 |
| 31 | 201.20 | 468.70 | 66 | 1,059.97 | 1,007.43 | 101 | 1,231.70 | 1,159.69 |
| 32 | 210.43 | 480.69 | 67 | 1,078.04 | 1,031.17 | 102 | 1,231.70 | 1,159.69 |
| 33 | 219.71 | 487.97 | 68 | 1,096.64 | 1,054.44 | 103 | 1,231.70 | 1,159.69 |
| 34 | 229.23 | 491.23 | 69 | 1,115.86 | 1,077.10 | 104 | 1,231.70 | 1,159.69 |
| 35 | 239.21 | 491.49 | 70 | 1,135.62 | 1,098.89 | 105 | 1,231.70 | 1,159.69 |
| 36 | 249.87 | 489.92 | 71 | 1,155.19 | 1,119.66 | 106 | 1,231.70 | 1,159.69 |
| 37 | 261.26 | 487.66 | 72 | 1,173.70 | 1,139.29 | 107 | 1,231.70 | 1,159.69 |
| 38 | 273.31 | 485.72 | 73 | 1,190.56 | 1,157.66 | 108 | 1,231.70 | 1,159.69 |
| 39 | 285.84 | 484.83 | 74 | 1,205.80 | 1,174.62 | 109 | 1,231.70 | 1,159.69 |
| 40 | 298.72 | 485.39 | 75 | 1,219.68 | 1,190.14 | 110 | 1,231.70 | 1,159.69 |
| 41 | 311.92 | 487.51 | 76 | 1,232.74 | 1,204.46 | 111 | 1,231.70 | 1,159.69 |
| 42 | 325.61 | 491.17 | 77 | 1,245.50 | 1,218.10 | 112 | 1,231.70 | 1,159.69 |
| 43 | 339.99 | 496.51 | 78 | 1,258.08 | 1,231.53 | 113 | 1,231.70 | 1,159.69 |
| 44 | 355.31 | 503.76 | 79 | 1,270.01 | 1,244.93 | 114 | 1,231.70 | 1,159.69 |
| 45 | 371.87 | 513.23 | 80 | 1,280.42 | 1,258.03 | 115 | 1,231.70 | 1,159.69 |
| 46 | 390.06 | 525.23 | 81 | 1,288.41 | 1,270.24 | 116 | 1,231.70 | 1,159.69 |
| 47 | 410.27 | 539.87 | 82 | 1,293.23 | 1,281.10 | 117 | 1,231.70 | 1,159.69 |
| 48 | 432.77 | 557.01 | 83 | 1,294.71 | 1,290.59 | 118 | 1,231.70 | 1,159.69 |
| 49 | 457.53 | 576.16 | 84 | 1,293.27 | 1,298.61 | 119 | 1,231.70 | 1,159.69 |
| 50 | 484.22 | 596.51 | 85 | 1,289.74 | 1,304.93 | 120 | 1,231.70 | 1,159.69 |

Aging factors were based on the 2013 SOA Study "Health Care Costs – From Birth to Death". While not shown, per capita costs for beneficiaries are based on the same aging factor tables as those of the retirees.

# Retiree Premium Rate Development

**Medical Payments Retiree Offset (MA and PDP)**

| Age | Gross Rate Male | Gross Rate Female | Age | Gross Rate Male | Gross Rate Female | Age | Gross Rate Male | Gross Rate Female |
|---|---|---|---|---|---|---|---|---|
| 16 | N/A | N/A | 51 | N/A | N/A | 86 | $1,111.08 | $1,132.38 |
| 17 | N/A | N/A | 52 | N/A | N/A | 87 | 1,106.55 | 1,135.36 |
| 18 | N/A | N/A | 53 | N/A | N/A | 88 | 1,102.11 | 1,137.65 |
| 19 | N/A | N/A | 54 | N/A | N/A | 89 | 1,098.06 | 1,139.25 |
| 20 | N/A | N/A | 55 | N/A | N/A | 90 | 1,094.53 | 1,139.63 |
| 21 | N/A | N/A | 56 | N/A | N/A | 91 | 1,091.44 | 1,138.04 |
| 22 | N/A | N/A | 57 | N/A | N/A | 92 | 1,088.63 | 1,133.53 |
| 23 | N/A | N/A | 58 | N/A | N/A | 93 | 1,085.84 | 1,125.20 |
| 24 | N/A | N/A | 59 | N/A | N/A | 94 | 1,082.82 | 1,112.21 |
| 25 | N/A | N/A | 60 | N/A | N/A | 95 | 1,079.35 | 1,093.90 |
| 26 | N/A | N/A | 61 | N/A | N/A | 96 | 1,075.29 | 1,069.72 |
| 27 | N/A | N/A | 62 | N/A | N/A | 97 | 1,070.51 | 1,039.37 |
| 28 | N/A | N/A | 63 | N/A | N/A | 98 | 1,065.01 | 1,002.75 |
| 29 | N/A | N/A | 64 | N/A | N/A | 99 | 1,065.01 | 1,002.75 |
| 30 | N/A | N/A | 65 | $ 901.39 | $ 850.19 | 100 | 1,065.01 | 1,002.75 |
| 31 | N/A | N/A | 66 | 916.52 | 871.09 | 101 | 1,065.01 | 1,002.75 |
| 32 | N/A | N/A | 67 | 932.15 | 891.62 | 102 | 1,065.01 | 1,002.75 |
| 33 | N/A | N/A | 68 | 948.23 | 911.74 | 103 | 1,065.01 | 1,002.75 |
| 34 | N/A | N/A | 69 | 964.85 | 931.33 | 104 | 1,065.01 | 1,002.75 |
| 35 | N/A | N/A | 70 | 981.94 | 950.17 | 105 | 1,065.01 | 1,002.75 |
| 36 | N/A | N/A | 71 | 998.86 | 968.13 | 106 | 1,065.01 | 1,002.75 |
| 37 | N/A | N/A | 72 | 1,014.86 | 985.10 | 107 | 1,065.01 | 1,002.75 |
| 38 | N/A | N/A | 73 | 1,029.44 | 1,000.99 | 108 | 1,065.01 | 1,002.75 |
| 39 | N/A | N/A | 74 | 1,042.62 | 1,015.66 | 109 | 1,065.01 | 1,002.75 |
| 40 | N/A | N/A | 75 | 1,054.62 | 1,029.07 | 110 | 1,065.01 | 1,002.75 |
| 41 | N/A | N/A | 76 | 1,065.91 | 1,041.45 | 111 | 1,065.01 | 1,002.75 |
| 42 | N/A | N/A | 77 | 1,076.95 | 1,053.25 | 112 | 1,065.01 | 1,002.75 |
| 43 | N/A | N/A | 78 | 1,087.82 | 1,064.86 | 113 | 1,065.01 | 1,002.75 |
| 44 | N/A | N/A | 79 | 1,098.13 | 1,076.45 | 114 | 1,065.01 | 1,002.75 |
| 45 | N/A | N/A | 80 | 1,107.14 | 1,087.78 | 115 | 1,065.01 | 1,002.75 |
| 46 | N/A | N/A | 81 | 1,114.05 | 1,098.33 | 116 | 1,065.01 | 1,002.75 |
| 47 | N/A | N/A | 82 | 1,118.21 | 1,107.72 | 117 | 1,065.01 | 1,002.75 |
| 48 | N/A | N/A | 83 | 1,119.49 | 1,115.93 | 118 | 1,065.01 | 1,002.75 |
| 49 | N/A | N/A | 84 | 1,118.25 | 1,122.86 | 119 | 1,065.01 | 1,002.75 |
| 50 | N/A | N/A | 85 | 1,115.19 | 1,128.33 | 120 | 1,065.01 | 1,002.75 |

Aging factors were based on the 2013 SOA Study "Health Care Costs – From Birth to Death". While not shown, per capita costs for beneficiaries are based on the same aging factor tables as those of the retirees.

# SECTION C

## SUMMARY OF POST-RETIREMENT HEALTH BENEFITS COVERAGE

# Summary of Post-Retirement Health Benefits Coverage

Members hired before September 4, 2012 have the option of subsidized health coverage, which was funded on a cash disbursement basis by the employers through fiscal year 2012. Beginning fiscal year 2013, it is funded on a prefunded basis. The Michigan Public School Employees' Retirement System (MPSERS) has contracted to provide comprehensive group medical, prescription drug, hearing, dental and vision coverage for retirees and beneficiaries. Health care benefits are provided both on a self-funded and fully insured basis. A portion of the premium is paid by the System with the balance paid by the benefit recipient.

Pension recipients hired before July 1, 2008 are eligible for 80% employer paid Master Health Plan and Dental and Vision coverage for themselves and their dependents. However, those retirees Medicare eligible on January 1, 2013 receive 90% employer subsidy. Certain eligibility requirements are described below:

a. In order to receive the subsidy, a member must meet the definition of an active member immediately preceding their retirement. A member is considered active and eligible if they have earned one-tenth (0.1) or more years of service in each of the five school fiscal years immediately before their retirement effective date, or at least one-half (0.5) years of service within the two school fiscal years immediately before their retirement effective date.

b. If a member initiated a service credit purchase on or after July 1, 2008, they are subject to a delayed insurance subsidy if the service credit purchase allows a member to retire for a benefit for which they would not have been eligible without the service credit purchase.

Members hired before July 1, 2008 who retire from deferred vested status with less than 30 years of service, who terminate employment after October 31, 1980 with vested deferred benefits, are eligible for partially MPSERS paid health benefit coverage (no payment if less than 21 years of service, 10% of the maximum MPSERS payment for each year of service over 20 years up to 100% of the maximum employer payment for 30 or more years of service). Members who retire from deferred status and terminated employment before October 31, 1980, are entitled to 100% of the subsidy allowed by law.

# Summary of Post-Retirement Health Benefits Coverage

Pension recipients hired after June 30, 2008, but before September 4, 2012 are eligible for 80% MPSERS paid Master Health Plan and Dental and Vision coverage for themselves and their dependents, but the premium subsidy is graded based on career length as described below:

a. Member is age 60 or older at retirement

- If member has 10 or more years of total service, MPSERS pays 30% of the monthly premium for the first 10 years of total service. The subsidy increases by an additional 4% for each additional year of service, up to the maximum of 80% of the monthly premium if 23 years of total service or more.
- If member has fewer than 10 years of total service, there is no MPSERS paid coverage.

b. Member is under age 60 at retirement

- If member has 25 years of actual service, the employer pays 80% of the monthly premium.
- If the member has under 25 years of actual service, upon attainment of age 60 the member may apply for employer paid coverage (as described by the schedule shown above in a.).

Coverage for eligible dependents is the same as the member's subsidy.

Members hired on or after September 4, 2012 become participants of the Personal Healthcare Fund (PHF) and will not be eligible for an insurance premium subsidy in retirement. For members hired on or after September 4, 2012, the maximum insurance premium subsidy is payable to the surviving spouse and health dependents of members who die as a result of injury or illness resulting from job activities. For all other members hired on or after September 4, 2012, their post-retirement health benefits coverage is limited to a credit into a Health Reimbursement Account at termination if they have at least 10 years of service. The credit will be $2,000 for participants who are at least age 60 at termination or $1,000 for participants who are less than age 60 at termination.

# Summary of Post-Retirement Health Benefits Coverage

Public Act 300 of 2012 granted all members of MPSERS, who earned service credit in the 12 months ending September 4, 2012, or were on an approved professional services or military leave of absence on September 4, 2012, a voluntary election regarding their retirement healthcare. Any changes to a member's healthcare benefit are effective as of the member's *transition date*, which is defined as the first day of the pay period that begins on or after February 1, 2013.

Under Public Act 300 of 2012, members were given the choice between i. and ii. below:

i. Maintaining eligibility for the premium subsidy described above, and contributing 3% of their compensation while still working, or
ii. Entering the PHF.

Members not making an election defaulted into the premium subsidy arrangement.

These contributions are refundable in certain cases:

- If you leave public school employment and do not qualify for any premium subsidy.
- If you die before becoming eligible for the subsidy benefit and your beneficiary is not eligible for a premium subsidy.
- If you die with retiree healthcare fund contributions still on account, and no survivor benefits are payable, any remaining contributions will be refunded to your refund beneficiary or your estate.

Refunds of member contributions to the healthcare funding account are issued as a supplemental retirement allowance (payable at age 60 and payable from the pension plan) paid out over a 60 month period.

A delayed subsidy applies to retirees who purchased service credit on or after July 1, 2008. Such individuals are eligible for premium subsidy benefits at age 60 or when they would have been eligible to retire without having made a service purchase, whichever comes first. They may enroll in the insurances earlier, but are responsible for the full premium until the premium subsidy begins.

# SECTION D

## FUND ASSETS

# Statement of Plan Net Assets (Assets at Market or Fair Value)

| | September 30 | |
|---|---|---|
| | 2019 | 2020 |
| Equity in Common Cash | $ 1,783,605 | $ 9,767,803 |
| Total Receivables | 221,286,251 | 510,794,402 |
| Short Term Investment Pools | 220,835,369 | 339,538,303 |
| Fixed Income Pools | 938,530,323 | 958,365,623 |
| Domestic Equity Pools | 1,549,248,963 | 1,672,335,053 |
| Real Estate Pool | 656,557,876 | 626,992,852 |
| Private Equity Pools | 1,282,258,094 | 1,540,749,367 |
| International Equity Pools | 1,100,557,003 | 1,249,896,614 |
| Absolute Return Pools | 1,124,462,332 | 375,942,270 |
| Real Return and Opportunistic Pools | 0 | 959,227,146 |
| Securities Lending Collateral less Obligations | 31,328 | 0 |
| Total Assets | 7,095,551,144 | 8,243,609,433 |
| Other Liabilities | (203,452,616) | (224,582,245) |
| Net Assets Held in Trust for Pension Benefits | $6,892,098,528 | $8,019,027,188 |

Note: The assets shown above are assumed to not include any assets associated with the Personal Healthcare Fund.

# Reconciliation of Market Value of Assets

| | For the One Year Period Ending | |
|---|---|---|
| | **September 30, 2019** | **September 30, 2020** |
| Market Value, Beginning of Year | $ 6,111,241,252 | $ 6,892,098,528 |
| Audit Adjustment, Beginning of Year | $ 283 | 34,921,939 |
| **Additions** | | |
| Contributions | | |
| Employer Contributions | $ 707,714,341 | $ 708,508,889 |
| Nonemployer Contributing Entities | - | - |
| Member Contributions | 208,197,137 | 204,752,249 |
| Other Governmental Contributions | 233,196,225 | 324,598,151 |
| Total Contributions | $ 1,149,107,703 | $ 1,237,859,289 |
| Investment Income | | |
| Net Appreciation in Fair Value of Investments | $ 266,683,697 | $ 259,249,044 |
| Interest and Dividends | 98,492,803 | 135,979,809 |
| Other Net Investment Income | 849,867 | 1,026,961 |
| Less Investment Expense | (29,962,931) | (21,685,678) |
| Net Investment Income | $ 336,063,436 | $ 374,570,136 |
| Other | $ 74,340 | $ 118,171 |
| **Total Additions** | $ 1,485,245,479 | $ 1,612,547,596 |
| **Deductions** | | |
| Health Benefit Payments | $ 700,290,929 | $ 514,327,302 |
| OPEB Plan Administrative Expense (1) | 4,097,557 | 6,213,573 |
| Other | - | - |
| **Total Deductions** | $ 704,388,486 | $ 520,540,875 |
| Market Value, End of Year | $ 6,892,098,528 | $ 8,019,027,188 |
| Net, Market Rate of Return | 5.31% | 5.14% |

*(1) Administrative expenses include staff salaries and benefits, consulting, printing, postage, telephone, and other.*

Note: The assets shown above are assumed to not include any assets associated with the Personal Healthcare Fund.

# Determination of Actuarial Value of Assets

| Year Ended September 30 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| A. Funding Value Beginning of Year | $ 6,957,871,742 | | | | |
| B. Market Value | | | | | |
| B1. Market Value End of Year | 8,019,027,188 | | | | |
| B2. Market Value Beginning of Year | 6,892,098,528 | | | | |
| B3. Audit Adjustment | 34,921,939 | | | | |
| C. Non-Investment Net Cash Flow | | | | | |
| C1. Member Contributions | 204,752,249 | | | | |
| C2. Employer Contributions | 708,508,889 | | | | |
| C3. Other Governmental Contributions | 324,598,151 | | | | |
| C4. Benefit Payments | (514,214,731) | | | | |
| C5. Contribution Refunds / Transfers | (112,571) | | | | |
| C6. Administrative Expenses | (6,213,573) | | | | |
| C7. Other | 118,171 | | | | |
| C8. Total Net Cash Flow: C1 + C2 + C3 + C4 + C5 + C6 + C7 | 717,436,585 | | | | |
| D. Investment Return | | | | | |
| D1. Market Return Total: B1 - B2 - B3 - C8 | 374,570,136 | | | | |
| D2. Assumed Rate of Return | 6.95% | | | | |
| D3. Market Rate of Return | 5.14% | | | | |
| D4. Dedicated Gains Policy Trigger (Excess Return %) | 0.00% | | | | |
| D5. Market Return for Immediate Recognition: D4 x (B2 + B3 + C8/2) | - | | | | |
| D6. Assumed Amount of Return: D2 x (A + B3 + C8/2) | 510,930,082 | | | | |
| D7. Amount Subject to Phase-In: D1 - D5 - D6 | (136,359,946) | | | | |
| E. Phased-In Recognition of Investment Return | | | | | |
| E1. Current Year: 0.20 x D7 | (27,271,989) | | | | |
| E2. First Prior Year | (20,522,482) | $ (27,271,989) | | | |
| E3. Second Prior Year | 5,438,905 | (20,522,482) | $ (27,271,989) | | |
| E4. Third Prior Year | - | 5,438,905 | (20,522,482) | $ (27,271,989) | |
| E5. Fourth Prior Year | - | - | 5,438,905 | (20,522,483) | $ (27,271,990) |
| E6. Total Phase-Ins | $ (42,355,566) | $ (42,355,566) | $ (42,355,566) | $ (47,794,472) | $ (27,271,990) |
| F. Funding Value End of Year | | | | | |
| F1. Preliminary Funding Value End of Year: A + B3 + C8 + D5 + D6 + E6 | $ 8,178,804,782 | | | | |
| F2. Corridor Percent | 30% | | | | |
| F3. Upper Corridor Limit: (100% + F2) x B1 | 10,424,735,344 | | | | |
| F4. Lower Corridor Limit: (100% - F2) x B1 | 5,613,319,032 | | | | |
| F5. Funding Value End of Year | $ 8,178,804,782 | | | | |
| G. Difference Between Market and Funding Value | (159,777,594) | | | | |
| H. Recognized Rate of Return | 6.37 % | | | | |
| I. Market Rate of Return | 5.14 % | | | | |
| J. Ratio of Funding Value to Market Value | 1.0199 | | | | |

# Determination of Actuarial Value of Assets (Continued)

| Year Ended September 30 | 2018 | 2019 |
|---|---|---|
| A. Funding Value Beginning of Year | $ 5,177,774,602 | $ 6,089,485,632 |
| B. Market Value | | |
| B1. Market Value End of Year | 6,111,241,252 | 6,892,098,528 |
| B2. Market Value Beginning of Year | 5,177,774,602 | 6,111,241,252 |
| B3. Audit Adjustment | - | 283 |
| C. Non-Investment Net Cash Flow | | |
| C1. Member Contributions | 210,679,559 | 208,197,137 |
| C2. Employer Contributions | 663,708,218 | 707,714,341 |
| C3. Other Governmental Contributions | 96,707,671 | 233,196,225 |
| C4. Benefit Payments | (628,361,484) | (700,257,338) |
| C5. Contribution Refunds / Transfers | (344,297) | (33,591) |
| C6. Administrative Expenses | Included in D1 | (4,097,557) |
| C7. Other | 96,020 | 74,340 |
| C8. Total Net Cash Flow: C1 + C2 + C3 + C4 + C5 + C6 + C7 | 342,485,687 | 444,793,557 |
| D. Investment Return | | |
| D1. Market Return Total: B1 - B2 - B3 - C8 | 590,980,963 | 336,063,436 |
| D2. Assumed Rate of Return | 7.15% | 6.95% |
| D3. Market Rate of Return | 11.05% | 5.31% |
| D4. Dedicated Gains Policy Trigger (Excess Return %) | 3.39% | 0.00% |
| D5. Market Return for Immediate Recognition: D4 x (B2 + B3 + C8/2) | 181,331,691 | - |
| D6. Assumed Amount of Return: D2 x (A + B3 + C8/2) | 382,454,747 | 438,675,847 |
| D7. Amount Subject to Phase-In: D1 - D5 - D6 | 27,194,525 | (102,612,411) |
| E. Phased-In Recognition of Investment Return | | |
| E1. Current Year: 0.20 x D7 | 5,438,905 | (20,522,482) |
| E2. First Prior Year | - | 5,438,905 |
| E3. Second Prior Year | - | - |
| E4. Third Prior Year | - | - |
| E5. Fourth Prior Year | - | - |
| E6. Total Phase-Ins | $ 5,438,905 | $ (15,083,577) |
| F. Funding Value End of Year | | |
| F1. Preliminary Funding Value End of Year: A + B3 + C8 + D5 + D6 + E6 | $ 6,089,485,632 | $ 6,957,871,742 |
| F2. Corridor Percent | 30% | 30% |
| F3. Upper Corridor Limit: (100% + F2) x B1 | 7,944,613,628 | 8,959,728,086 |
| F4. Lower Corridor Limit: (100% - F2) x B1 | 4,277,868,876 | 4,824,468,970 |
| F5. Funding Value End of Year | $ 6,089,485,632 | $ 6,957,871,742 |
| G. Difference Between Market and Funding Value | 21,755,620 | (65,773,214) |
| H. Recognized Rate of Return | 10.64 % | 6.71 % |
| I. Market Rate of Return | 11.05 % | 5.31 % |
| J. Ratio of Funding Value to Market Value | 0.9964 | 1.0095 |

# SECTION E

## SUMMARY OF REPORTED PARTICIPANT DATA

# Summary of Reported Participant Data as of the Indicated Valuation Date

| Reported Program Participants | September 30, 2019 | September 30, 2020 |
|---|---|---|
| **Active Members** [5] | | |
| **Graded Premium** | | |
| Number | 129,046 | 120,889 |
| Average age | 49.4 | 49.8 |
| Average service | 16.8 | 17.3 |
| Reported payroll (millions) [4] | $6,730.5 | $6,573.8 |
| Average annual pay | $52,156 | $54,379 |
| **Personal Healthcare Fund** | | |
| Number [3] | 74,825 | 77,994 |
| Reported payroll (millions) [4] | $1,950.1 | $2,137.6 |
| Average annual pay | $26,062 | $27,407 |
| **Inactive Vested Members** | | |
| Number [1] | 2,471 | 2,281 |
| Average age | 57.4 | 56.3 |
| **Retirees and Beneficiaries** | | |
| Number [2] | 218,937 | 221,478 |
| Average age | 73.0 | 73.3 |

[1] *Only includes inactive vested persons with 21 or more years of service at termination (10 or more years for MIPP/PPP members).*

[2] *Includes alternate payees and other individuals not eligible for or otherwise receiving subsidized retiree health benefits.*

[3] *Of the 77,994 PHF actives as of September 30, 2020, 67,876 were hired on or after September 4, 2012 and are eligible for the $1,000/$2,000 lump sum at termination benefit.*

[4] *The total annual payroll reported in the valuation data (including payroll for those employees excluded from the active data statistics above) is $8,716.3 million as of September 30, 2020 ($8,690.8 million as of September 30, 2019). UAAL contributions are expected to continue to be collected on the payroll of all active members in the future.*

[5] *The active member statistics exclude people provided in the valuation with both $0 pay and 0 service (5,232 as of September 30, 2019 and 3,028 as of September 30, 2020).*

# SECTION F

## ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

# Valuation Methods

***Actuarial cost method -*** Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an Individual Entry-Age Actuarial Cost Method having the following characteristics:

(i) The annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and

(ii) Each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains (losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

***Financing of unfunded actuarial accrued liabilities -*** Unfunded actuarial accrued liabilities (full funding credit if assets exceed liabilities) were amortized by level (principal & interest combined) percent-of-payroll contributions over a reasonable period of future years. It is expected that the unfunded actuarial accrued liabilities will be fully amortized by the end of fiscal year 2038. For amortization purposes only, the payroll growth assumption is based upon the following schedule outlined in Public Act 181 of 2018 (PA 181): 3.50% for the September 30, 2017 and 2018 valuations, dropping 0.50% each subsequent year starting with the September 30, 2019 valuation, until an ultimate payroll growth assumption of 0.00% is reached beginning with the September 30, 2025 valuation.

***Actuarial value of system assets -*** The actuarial value of assets recognizes assumed investment income fully each year. Differences between actual and assumed investment income are phased in over a closed five year period. During periods when investment performance exceeds the assumed rate, actuarial value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, actuarial value of assets will tend to be greater than market value. The actuarial value of assets is not permitted to deviate from the market value of assets by more than 30%. The actuarial value of assets was adopted for use in the annual valuations beginning with the September 30, 2018 funding valuation for the System.

# Actuarial Assumptions

In accordance with Section 41(1) of the MPSERS statute (Act 300 of the Public Acts of 1980, as amended), the actuarial assumptions are adopted by the Retirement Board and the Department of Technology, Management and Budget after consultation with the actuary and the State Treasurer. The actuarial assumptions were based upon the results of an Experience Study for MPSERS covering the period October 1, 2012 through September 30, 2017. A report dated May 15, 2018 presented the results of the Experience Study. The investment return assumption was updated beginning with the September 30, 2018 valuation in accordance with the Dedicated Gains Policy adopted by the Board of Trustees. The actuarial assumptions represent estimates of future experience.

***The rate of investment return***, compounded annually net of investment expenses and including a component of 2.25% for price inflation, was assumed to be 6.95%. This assumption was first used for the September 30, 2018 funding valuation of the System.

***The rates of salary increase*** used for individual members are in accordance with the table below. This assumption is used to project a member's current pay to pay at retirement. This assumption was first used for the September 30, 2018 valuation of the System.

| | Salary Increase Assumptions For an Individual Member | | |
|---|---|---|---|
| Sample Ages | Merit & Seniority | Base (Economy) | Increase Next Year |
| 20 | 8.80 % | 2.75 % | 11.55 % |
| 25 | 8.80 | 2.75 | 11.55 |
| 30 | 4.96 | 2.75 | 7.71 |
| 35 | 3.10 | 2.75 | 5.85 |
| 40 | 1.90 | 2.75 | 4.65 |
| 45 | 1.14 | 2.75 | 3.89 |
| 50 | 0.54 | 2.75 | 3.29 |
| 55 | 0.18 | 2.75 | 2.93 |
| 60 | 0.00 | 2.75 | 2.75 |
| 65 | 0.00 | 2.75 | 2.75 |
| Ref | 510 | | |

The charts shown in this section of the report may include a reference number (for example 510 is used above). These reference numbers are used by GRS to track and identify assumption tables.

# Actuarial Assumptions

***The healthy life post-retirement mortality table*** is used to measure the probabilities of each benefit payment being made after retirement for healthy lives.

| | |
|---|---|
| Healthy Male Retirees: | RP-2014 Male Healthy Annuitant Mortality Table scaled by 82% and adjusted for mortality improvements using projection scale MP-2017 from 2006. |
| Healthy Female Retirees: | RP-2014 Female Healthy Annuitant Mortality Table scaled by 78% and adjusted for mortality improvements using projection scale MP-2017 from 2006. |

This assumption was first used for the September 30, 2018 valuation of the System. Sample rates of mortality and years of life expectancy are shown below.

| Sample Attained Ages | Probability of Dying Next Year | | Future Life Expectancy (years) | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 50 | 0.33 % | 0.21 % | 36.55 | 39.55 |
| 55 | 0.47 | 0.30 | 31.71 | 34.54 |
| 60 | 0.66 | 0.45 | 27.04 | 29.66 |
| 65 | 0.95 | 0.66 | 22.58 | 24.99 |
| 70 | 1.41 | 1.01 | 18.36 | 20.51 |
| 75 | 2.23 | 1.65 | 14.42 | 16.29 |
| 80 | 3.76 | 2.83 | 10.87 | 12.44 |

*Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the fully generational MP-2017 projection scale.*

***For active members***, the probabilities of dying before retirement (i.e., pre-retirement mortality) are as follows:

| | |
|---|---|
| Male Active Members: | RP-2014 Male Employee Mortality Table scaled by 100% and adjusted for mortality improvements using projection scale MP-2017 from 2006. |
| Female Active Members: | RP-2014 Female Employee Mortality Table scaled by 100% and adjusted for mortality improvements using projection scale MP-2017 from 2006. |

This assumption was first used for the September 30, 2018 valuation of the System. Sample rates of mortality and years of life expectancy are shown on the next page.

# Actuarial Assumptions

| Sample Attained Ages | Probability of Dying Next Year | | Future Life Expectancy (years) | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 20 | 0.04 % | 0.02 % | 68.11 | 72.32 |
| 25 | 0.05 | 0.02 | 62.78 | 66.99 |
| 30 | 0.05 | 0.02 | 57.45 | 61.66 |
| 35 | 0.06 | 0.03 | 52.14 | 56.35 |
| 40 | 0.07 | 0.05 | 46.84 | 51.07 |
| 45 | 0.10 | 0.07 | 41.56 | 45.81 |
| 50 | 0.17 | 0.11 | 36.35 | 40.61 |
| 55 | 0.28 | 0.18 | 31.25 | 35.49 |
| 60 | 0.49 | 0.27 | 26.32 | 30.47 |
| 65 | 0.88 | 0.39 | 21.68 | 25.58 |

*Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the fully generational MP-2017 projection scale. Active member deaths are assumed to be non-duty related.*

***The disabled life mortality table*** is used to measure the probabilities of each benefit payment being made after retirement for disabled lives.

Disabled Male Retirees: RP-2014 Male Disabled Annuitant Mortality Table scaled by 100% and adjusted for mortality improvements using projection scale MP-2017 from 2006.

Disabled Female Retirees: RP-2014 Female Disabled Annuitant Mortality Table scaled by 100% and adjusted for mortality improvements using projection scale MP-2017 from 2006.

This assumption was first used for the September 30, 2018 valuation of the System. Sample rates of mortality and years of life expectancy are shown below.

| Sample Attained Ages | Probability of Dying Next Year | | Future Life Expectancy (years) | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 50 | 2.00 % | 1.16 % | 24.48 | 28.90 |
| 55 | 2.33 | 1.52 | 21.35 | 25.08 |
| 60 | 2.77 | 1.88 | 18.30 | 21.53 |
| 65 | 3.35 | 2.19 | 15.43 | 18.11 |
| 70 | 4.14 | 2.83 | 12.68 | 14.74 |
| 75 | 5.51 | 4.14 | 10.05 | 11.57 |
| 80 | 7.86 | 6.35 | 7.66 | 8.82 |

*Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the fully generational MP-2017 projection scale.*

# Actuarial Assumptions

***The rates of retirement*** used to measure the probability of eligible members retiring during the next year are shown below. These assumptions were first used for the September 30, 2018 valuation of the System.

A Basic member is eligible for normal retirement after attaining age 55 with 30 or more years of credited service, or after attaining age 60 with 10 or more years of credited service.

A MIP member is eligible for normal retirement after 30 years of service, or after attaining age 60 with 5 or more years of service.

A Basic or MIP member is eligible for early retirement after attaining age 55 with 15 but less than 30 years of credited service.

A Pension Plus member is eligible for normal retirement after attaining age 60 with 10 or more years of credited service. Pension Plus members are not eligible for early retirement. Currently, Pension Plus 2 members have the same retirement eligibility and retirement rates as Pension Plus members.

**Normal Retirement**

| Retirement Ages | Percent of Eligible Members Retiring | | | |
|---|---|---|---|---|
| | Basic Members | | MIP# and Pension Plus Members | |
| | Teachers | Non-Teachers | Teachers | Non-Teachers |
| 55 | 25 % | 20 % | | |
| 56 | 21 | 20 | | |
| 57 | 16 | 18 | | |
| 58 | 16 | 18 | | |
| 59 | 18 | 18 | | |
| 60 | 20 | 18 | 20 % | 17 % |
| 61 | 20 | 18 | 20 | 17 |
| 62 | 29 | 29 | 23 | 24 |
| 63 | 29 | 29 | 23 | 24 |
| 64 | 25 | 24 | 23 | 20 |
| 65 | 25 | 24 | 25 | 20 |
| 66 | 30 | 30 | 30 | 26 |
| 67 | 25 | 28 | 25 | 20 |
| 68 | 25 | 23 | 25 | 16 |
| 69 | 25 | 20 | 25 | 16 |
| 70 | 25 | 20 | 25 | 16 |
| 71 | 21 | 20 | 25 | 16 |
| 72 | 21 | 20 | 25 | 16 |
| 73 | 21 | 20 | 20 | 16 |
| 74 | 21 | 20 | 20 | 16 |
| 75 & Over | 100 | 100 | 100 | 100 |
| Ref | 2835 | 2836 | 2837 | 2838 |

*# Applies to MIP members with fewer than 30 years of service.*

# Actuarial Assumptions

**Normal Retirement**

| Years of Service | Percent of Eligible Members Retiring | |
|---|---|---|
| | MIP Members with 30+ Years of Service | |
| | Teachers | Non-Teachers |
| 30 | 25 % | 25 % |
| 31 | 20 | 25 |
| 32 | 20 | 20 |
| 33 | 18 | 20 |
| 34 | 19 | 20 |
| 35 | 19 | 20 |
| 36 | 21 | 20 |
| 37 | 24 | 20 |
| 38 | 24 | 20 |
| 39 | 27 | 25 |
| 40 | 30 | 25 |
| 41 | 30 | 25 |
| 42 | 30 | 30 |
| 43 | 30 | 30 |
| 44 | 30 | 30 |
| 45 | 30 | 30 |
| 46 | 30 | 30 |
| 47 | 30 | 30 |
| 48 | 30 | 30 |
| 49 | 30 | 30 |
| 50 | 100 | 100 |
| Ref | 2833 | 2834 |

**Early Retirement**

| Retirement Age | Percent of Eligible Members Retiring | |
|---|---|---|
| | Basic Members | MIP Members |
| 55 | 4.0 % | 4.0 % |
| 56 | 5.0 | 5.0 |
| 57 | 5.5 | 5.5 |
| 58 | 5.5 | 5.5 |
| 59 | 6.0 | 6.0 |
| Ref | 2832 | 2832 |

# Actuarial Assumptions

***Rates of separation from active membership*** used in the valuation are shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment, and was first used for the September 30, 2018 valuation of the System.

| Sample Ages | Years of Service | Percent Separating within Next Year | | | |
|---|---|---|---|---|---|
| | | Pay More Than $20,000 | | Pay Less Than $20,000 | |
| | | Teachers | Non-Teachers | Teachers | Non-Teachers |
| All | 0 | 15.00 % | 35.00 % | 30.00 % | 40.00 % |
| | 1 | 10.00 | 14.00 | 25.00 | 26.00 |
| | 2 | 6.50 | 8.20 | 22.00 | 19.00 |
| | 3 | 6.00 | 6.80 | 22.00 | 16.00 |
| | 4 | 4.50 | 5.70 | 22.00 | 14.00 |
| 20 | 5 & over | 3.00 | 5.00 | 22.00 | 14.00 |
| 25 | | 3.00 | 4.76 | 22.00 | 14.00 |
| 30 | | 2.58 | 3.76 | 22.00 | 14.00 |
| 35 | | 1.82 | 2.78 | 20.80 | 13.40 |
| 40 | | 1.32 | 2.20 | 18.20 | 11.80 |
| 45 | | 1.08 | 1.88 | 16.40 | 9.80 |
| 50 | | 1.00 | 1.80 | 16.00 | 8.40 |
| 55 | | 1.00 | 1.80 | 16.00 | 8.00 |
| 60 | | 1.00 | 1.80 | 16.00 | 8.00 |
| Svc Ref | | 1136 | 877 | 1135 | 1137 |
| Age Ref | | 1453 | 1454 | 1450 | 1451 |

Pension Plus 2 members are assumed to experience 50% of the assumed withdrawal rates above.

# Actuarial Assumptions

***Rates of disability*** among active members used in the valuation are shown below, and were first used in the September 30, 2010 valuation of the System. Disabilities are assumed to be non-duty related.

| Sample Ages | Percent Becoming Disabled Within Next Year |
|---|---|
| 20 | 0.00 % |
| 25 | 0.01 |
| 30 | 0.01 |
| 35 | 0.02 |
| 40 | 0.05 |
| 45 | 0.10 |
| 50 | 0.18 |
| 55 | 0.26 |
| 60 | 0.36 |
| Ref. | 393 x 0.80 |

***Service Credit Accrual Rates:*** Members were assumed to accrue service credit each year as described in the table below:

| | Assumed Average Service Credit Accrued Each Year |
|---|---|
| Teachers with Pay Over $20,000 | 0.93 years |
| Non-Teachers with Pay Over $20,000 | 0.93 |
| Teachers with Pay Under $20,000 | 0.60 |
| Non-Teachers with Pay Under $20,000 | 0.65 |

These accrual rates were first used for the September 30, 2014 valuation of the System.

# Actuarial Assumptions

***Unknown Data***:

- Members with unknown gender were assumed to be female.
- Members with unknown dates of birth were assumed to have an entry-age equal to 32 for Basic members, 33 for MIP members, 35 for PPP members, and 33 for PPP2 members.
- Active members with non-zero service who were reported without any annual pay were assumed to have pay equal to the average pay of the corresponding active group.
- Members with unknown pre-PA 300 benefit plan codes were assumed to be MIP Graded.

# Actuarial Assumptions

***Election of two-person retiree health coverage -*** When retiree health costs are valued, an assumption must be made regarding the probability that the plan will be providing coverage during the retiree's lifetime to the retiree only or to the retiree and spouse. For those who are assumed to participate in the retiree health care plan, the assumptions used in this valuation are as follows:

| Participant Type | % Election of Two-Person Coverage |
|---|---|
| Active and Inactive members (future retirees) | 75% male/60% female |
| Retirees | Actual member data used |

***Election of joint and survivor form of payment -*** Retiree health benefits are continued to the eligible beneficiary of a qualifying retiree after the retiree's death if the beneficiary receives a continuation of the pension due to an optional benefit election. When retiree health costs are valued, an assumption must be made regarding the probability that the retiring member will have coverage for a surviving beneficiary or spouse. The assumption for active and inactive members is that 80% of male retirees and 67% of female retirees electing two-person coverage, will have coverage continuing to a surviving beneficiary or spouse.

***Opt-out assumption*** - We have assumed that 21% of future pension recipients hired before July 1, 2008 and 30% of future pension recipients hired on or after July 1, 2008 will opt out of the retiree health care plan. The assumption for future pension recipients hired before July 1, 2008 is based on the number of current health contracts compared to the number of current retirees and beneficiaries eligible for retiree medical coverage. The assumption for future pension recipients hired after July 1, 2008 is estimated, under the assumption that more retirees will opt out, given the lower employer subsidy. This assumption will be monitored closely in the future as experience becomes available.

# Actuarial Assumptions

***Health Care Cost Trend Rates –*** The reported per person premium is projected to increase as shown in the table below:

| Health Care Cost Trend Rates | | | |
|---|---|---|---|
| | Medical / Prescription Drug Premium Increase | | |
| October 1 | Pre-65 | Post-65* | Dental / Vision Premium Increase |
| 2021 | 7.75 % | 5.25 % | 3.50 % |
| 2022 | 7.50 | 5.00 | 3.50 |
| 2023 | 7.25 | 5.00 | 3.50 |
| 2024 | 7.00 | 5.00 | 3.50 |
| 2025 | 6.50 | 4.75 | 3.50 |
| 2026 | 6.25 | 4.75 | 3.50 |
| 2027 | 6.00 | 4.50 | 3.50 |
| 2028 | 5.75 | 4.50 | 3.50 |
| 2029 | 5.25 | 4.25 | 3.50 |
| 2030 | 5.00 | 4.25 | 3.50 |
| 2031 | 4.75 | 4.00 | 3.50 |
| 2032 | 4.50 | 4.00 | 3.50 |
| 2033 | 4.00 | 3.75 | 3.50 |
| 2034 | 3.75 | 3.75 | 3.50 |
| 2035-2139 | 3.50 | 3.50 | 3.50 |
| 2140 | 3.00 | 3.00 | 3.00 |

** Trend used for purposes of the Medicare Offset Payment as well.*

The retiree share of the per person premium was assumed to increase at the same rate as the medical/prescription drug premiums.

Health care cost trend rates are established for each annual actuarial valuation. These assumptions are used to determine how much per capita costs are expected to increase from one year to the next. In general, the trend rates are higher in the years immediately following the valuation, grading down over the next 10 to 15 years to the "ultimate health care trend rate." Prior to the most recent Experience Study covering the period 2012 through 2017, the ultimate health care trend rate would be set equal to the wage inflation assumption. However, with the wage inflation assumption being set at 2.75%, we were uncomfortable having an ultimate health care trend rate below 3.00%. Therefore, we recommended an ultimate health care trend rate of 3.00% be adopted. Subsequent to the Experience Study, the GRS retiree health care actuary that establishes the health care trend rates for the annual actuarial valuation established a "floor" for the ultimate health care trend rate of 3.50%. Therefore, to comply with the adopted assumption of 3.00% and the recently established floor, for this valuation, the adopted ultimate health care trend rate of 3.00% becomes effective in the 120$^{th}$ year following the valuation date.

# Miscellaneous and Technical Assumptions

| | |
|---|---|
| ***Administrative Expenses*** | The normal cost contribution includes a 0.05% of payroll load for administrative expenses. |
| ***Cadillac Tax*** | On December 20, 2019, the "Further Consolidated Appropriations Act of 2020," H.R. 1865, was signed into law. The Act repeals the "Cadillac Tax" which was a tax provision from the Affordable Care Act (ACA). As a result, no adjustments associated with the "Cadillac Tax" are required. |
| ***Decrement Operation*** | Disability and withdrawal decrements do not operate during retirement eligibility. |
| ***Decrement Timing*** | Retirement decrements are assumed to occur on July 1. All other decrements are assumed to occur mid-year. |
| ***Eligibility Testing*** | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| ***Health Care Reform*** | Health care reform was considered in the valuation to the extent that reported per capita costs reflect plan changes due to health care reform. |
| ***Incidence of Contributions*** | Contributions are assumed to be received continuously throughout the year. |
| ***Liability Adjustments*** | None. |
| ***Marriage Assumption*** | 75% of males and 65% of females were assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active and inactive member valuation purposes. |
| ***Medicare MA and PDP Payments*** | MA payments from Medicare were assumed to continue indefinitely and increase in accordance with the rates shown on the prior page. |
| ***Normal Cost Adjustment*** | The normal cost has been loaded by 0.5% of payroll to reflect the potential for retiree health trend adjustments in future valuations. |
| ***Pure DC Demographic Assumptions*** | For purposes of the $1,000/$2,000 credit to a Health Reimbursement Account, those who elected a pure defined contribution pension benefit were assumed to follow the service accrual rates and withdrawal decrements for those with greater than $20,000 pay. |

# Miscellaneous and Technical Assumptions

***Reconciliation Payments***

ORS provided the following schedule of reconciliation payments. For purposes of determining the present value of reconciliation payments, it was assumed that payments occur in the middle of the fiscal period.

| Fiscal Year | Reconciliation Payment |
|---|---|
| 2021 | $ 8,178,733 |
| 2022 | 8,792,680 |
| 2023 | 8,304,251 |
| 2024 | 7,815,822 |
| 2025 | 7,327,393 |
| 2026 | 825,236 |

***Salary Increase Timing***

Salary increases were assumed to be at the beginning of the fiscal year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

# APPENDIX

## SUPPLEMENTARY INFORMATION

# Supplementary Information

**Schedule of Health Funding Progress**
**($ Amounts in Millions)**

| Valuation Date September 30 | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded AAL (UAAL) (b-a) | Funded Ratio (a/b) | UAAL Covered Payroll (c) | UAAL as a % of Covered Payroll ((b-a)/c) |
|---|---|---|---|---|---|---|
| 2011 | $ 1,155.9 | $ 27,046.1 | $ 25,890.2 | 4.27% | $ 9,155.7 | 282.8% |
| 2012 | 1,347.7 | 26,199.0 | 24,851.3 | 5.14 | 8,649.0 | 287.3 |
| 2012 [1,3] | 1,347.7 | 16,593.8 | 15,246.1 | 8.12 | 8,649.0 | 176.3 |
| 2012 [2] | 1,347.7 | 14,787.8 | 13,440.1 | 9.11 | 8,649.0 | 155.4 |
| 2013 | 2,040.7 | 14,534.1 | 12,493.4 | 14.04 | 8,273.0 | 151.0 |
| 2014 | 2,981.7 | 14,161.4 | 11,179.7 | 21.06 | 8,166.7 | 136.9 |
| 2015 | 3,530.6 | 12,832.4 | 9,301.9 | 27.51 | 8,263.9 | 112.6 |
| 2016 | 4,279.1 | 13,105.1 | 8,826.1 | 32.65 | 8,206.1 | 107.6 |
| 2016 [3] | 4,279.1 | 13,776.4 | 9,497.3 | 31.06 | 8,206.1 | 115.7 |
| 2017 | 5,177.8 | 13,115.7 | 7,938.0 | 39.48 | 8,220.8 | 96.6 |
| 2017 [3] | 5,177.8 | 13,587.7 | 8,409.9 | 38.11 | 8,220.8 | 102.3 |
| 2018 | 5,944.4 | 12,872.7 | 6,928.3 | 46.18 | 8,300.0 | 83.5 |
| 2018 [3] | 6,089.5 | 13,748.9 | 7,659.5 | 44.29 | 8,300.0 | 92.3 |
| 2019 | 6,957.9 | 13,009.7 | 6,051.8 | 53.48 | 8,690.8 | 69.6 |
| 2020 | 8,178.8 | 11,884.9 | 3,706.1 | 68.82 | 8,716.3 | 42.5 |

[1] *Assumes pre-funding begins fiscal year 2013.*
[2] *Change in plan provisions.*
[3] *Change in assumptions (not including trend assumption).*

# Supplementary Information

## Schedule of Employer Health Contributions

| Fiscal Year Ended September 30 | Actuarially Computed Employer Contribution [6] | Actual Contributions [2,5] | Percentage Contributed |
|---|---|---|---|
| 2012 | $ 2,038,873,189 | $ 813,001,836 | 39.9% |
| 2013 | 1,466,840,465 [3] | 973,011,827 | 66.3 |
| 2014 | 944,571,363 [4] | 1,000,169,741 | 105.9 |
| 2015 | 974,957,230 | 969,631,394 | 99.5 |
| 2016 | 911,687,353 | 886,354,172 | 97.2 |
| 2017 | 815,984,986 | 794,666,783 | 97.4 |
| 2018 | 673,996,085 | 663,708,218 | 98.5 |
| 2019 | 711,059,338 | 707,714,341 | 99.5 |
| 2020 | 638,384,571 | 708,508,889 | 111.0 |
| 2021 | 605,290,358 | [1] | [1] |

[1] *Not Available.*

[2] *Pay-go employer contributions for fiscal years 2012 and before.*

[3] *Based upon 2011 valuation results. The actuarially computed employer contribution of 14.84% of payroll (based upon an 8% interest discount) multiplied by projected payroll of $9.88 billion. The 8% interest discount was used due to the fact that pre-funding of the retiree health was reported to begin in February of fiscal year 2013.*

[4] *Based upon 2012 valuation results.*

[5] *Prior to fiscal year 2018, included Other Governmental Contributions.*

[6] *The actuarially computed employer contribution amounts presented throughout this report do not reflect the normal cost or UAAL "floor" provisions of Public Act 92 of 2017 and Public Act 181 of 2018 and are in addition to any reconciliation payments as required by subsection 41(9) of MPSERS statute.*

# Supplementary Information

The following assumptions and methods were used in the September 30, 2020 actuarial valuation results shown on the previous page:

| | |
|---|---|
| Valuation Date | September 30, 2020 |
| Actuarial Cost Method | Entry-Age |
| Amortization Method | Level Percent of Payroll, Closed |
| Remaining Amortization Period | 16 years, Ending September 30, 2038 |
| Asset Valuation Method | 5-Year Smoothed Market Value |
| Actuarial Assumptions: | |
| Investment Rate of Return (discount rate) | 6.95% per year |
| Wage Inflation Rate | 2.75% |
| Payroll Growth (Actual Payroll) | 2.75% |
| Payroll Growth (Amortization Purposes) | 2.50% |
| Health Care Cost Trend Rates | |
| Medical / Prescription Drug Premiums (Pre-65) | 7.75% Year 1 graded to 3.50% Year 15; 3.00% Year 120 |
| Medical / Prescription Drug Premiums (Post-65) | 5.25% Year 1 graded to 3.50% Year 15; 3.00% Year 120 |
| Medicare Offset Payments | 5.25% Year 1 graded to 3.50% Year 15; 3.00% Year 120 |
| Dental / Vision Premiums | 3.50% each year; 3.00% Year 120 |