GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

PUBLIC EMPLOYEES RETIREMENT ASSOCIATION OF MINNESOTA

# GENERAL EMPLOYEES RETIREMENT PLAN

GASB STATEMENTS NO. 67 AND NO. 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2016

GRS
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December 2, 2016

Public Employees Retirement Association of Minnesota
General Employees Retirement Plan
St. Paul, Minnesota

Dear Trustees of the General Employees Retirement Plan:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the General Employees Retirement Plan ("GERP"), as amended by Statement No. 82. These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust. GASB Statement No. 82 is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting statements.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligations. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. PERA is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer. This report may be provided to parties other than the Public Employees Retirement Association (PERA) only in its entirety and only with the permission of PERA. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by PERA, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not audited.

This report complements the actuarial valuation report for funding purposes that was or will be provided to the System and should be considered in conjunction with that report. Please see the actuarial valuation report as of June 30, 2016 for additional discussion of the nature of actuarial calculations and more information related to participant date, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the General Employees Retirement Plan as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

The signing actuaries are independent of the plan sponsor.

Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

By Brian B. Murphy
Brian B. Murphy
FSA, EA, FCA, MAAA

By Bonita J. Wurst
Bonita J. Wurst
ASA, EA, FCA, MAAA

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# SECTION A

## EXECUTIVE SUMMARY

# EXECUTIVE SUMMARY
## AS OF JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | 2016 |
|---|---|---|
| Actuarial Valuation Date | | June 30, 2016 |
| Measurement Date of the Net Pension Liability | | June 30, 2016 |
| Employer's Fiscal Year Ending Date (Reporting Date) | | Varies by Employer |
| **Membership** | | |
| Number of | | |
| - Service Retirements | | 81,911 |
| - Survivors | | 8,547 |
| - Disability Retirements | | 3,830 |
| - Deferred Retirements | | 52,516 |
| - Terminated other non-vested | | 132,416 |
| - Active Members | | 148,745 |
| - Total | | 427,965 |
| Covered Payroll | $ | 5,773,708 |
| **Net Pension Liability** | | |
| Total Pension Liability | $ | 26,114,413 |
| Plan Fiduciary Net Position | $ | 17,994,909 |
| Net Pension Liability | $ | 8,119,504 |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability | | 68.91% |
| Net Pension Liability as a Percentage of Covered Payroll | | 140.63% |
| **Development of the Single Discount Rate** | | |
| Single Discount Rate | | 7.50% |
| Long-Term Expected Rate of Investment Return | | 7.50% |
| Long-Term Municipal Bond Rate* | | 2.85% |
| Last year ending June 30 in the 2017 to 2116 projection period for which projected benefit payments are fully-funded | | 2116 |
| **Total Pension Expense/ (Income)** | $ | 1,029,038 |

**Deferred Outflows and Inflows by Source Arising from Current and Prior Periods to be Recognized in Future Pension Expenses**

| | | Deferred Outflows of Resources | | Deferred Inflows of Resources |
|---|---|---|---|---|
| Difference between expected and actual experience | $ | 24,030 | $ | 659,589 |
| Changes in assumptions | $ | 1,751,180 | $ | - |
| Net difference between projected and actual earnings on pension plan investments | $ | 1,541,117 | $ | 634,630 |
| Total | $ | 3,316,327 | $ | 1,294,219 |

** Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 30, 2016.*

# DISCUSSION

**Accounting Standard**

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements. Governmental Accounting Standards Board (GASB) Statement No. 82, Pension Issues, is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

**Financial Statements**

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to GERP subsequent to the measurement date of June 30, 2016.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *statement of changes in fiduciary net position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

**Notes to Financial Statements**

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

Both GASB Statement No. 67 and No. 68 require the notes of the financial statements for the employers and pension plans, to include certain additional information. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the type of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with Statement No. 67. This information includes:

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

**Required Supplementary Information**

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

## Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2016 and a measurement date of June 30, 2016.

## Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

## General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.50% on the market value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain approximately level as a percentage of payroll.
2. The funded status of the plan is expected to gradually improve but is not expected to be 100% funded in the next 50 years.

The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

## Limitations of Funded Status Measurements

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 regard 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 other words of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, 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.

## Limitation of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

## Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a single discount rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 2.85% (based on the weekly rate closest to but not later than the measurement date of the Bond Buyer 20-Year GO Index); and the resulting single discount rate is 7.50%. The long-term expected rate of return is based on a review of inflation and investment assumptions, dated September 11, 2014, and a recent asset liability study obtained by the Minnesota State Board of Investment.

## Effective Date and Transition

GASB Statements No. 67 and No. 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB.

# SECTION B

## FINANCIAL STATEMENTS

# PENSION EXPENSE UNDER GASB STATEMENT NO. 68
# FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | |
|---|---|---|
| **A. Expense** | | |
| 1. Service Cost | $ | 434,551 |
| 2. Interest on the Total Pension Liability | | 1,839,388 |
| 3. Current-Period Benefit Changes | | 0 |
| 4. Employee Contributions (made negative for addition here) | | (375,291) |
| 5. Projected Earnings on Plan Investments (made negative for addition here) | | (1,445,603) |
| 6. Pension Plan Administrative Expense | | 11,350 |
| 7. Other Changes in Plan Fiduciary Net Position | | (431) |
| 8. Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability | | |
| *Arising from Current Reporting Period* | | (161,799) |
| 9. Recognition of Outflow (Inflow) of Resources due to assumption changes | | |
| *Arising from Current Reporting Period* | | 529,936 |
| 10. Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments | | |
| *Arising from Current Reporting Period* | | 293,291 |
| 11. **Increase/(Decrease) from Experience in Current Reporting Period** | **$** | **1,125,392** |
| 12. Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability | | |
| *Arising from Prior Reporting Periods* | | (63,065) |
| 13. Recognition of Outflow (Inflow) of Resources due to assumption changes | | |
| *Arising from Prior Reporting Periods* | | 161,375 |
| 14. Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments | | |
| *Arising from Prior Reporting Periods* | | (194,664) |
| 15. **Total Pension Expense / (Income)** | **$** | **1,029,038** |

# STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | |
|---|---|---|
| **A. Outflows (Inflows) of Resources due to Liabilities** | | |
| 1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses | $ | (647,197) |
| 2. Assumption Changes (gains) or losses | $ | 2,119,742 |
| 3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years} | | 4.0000 |
| 4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability | $ | (161,799) |
| 5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes | $ | 529,936 |
| 6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities | $ | 368,137 |
| 7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability | $ | (485,398) |
| 8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes | $ | 1,589,806 |
| 9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities | $ | 1,104,408 |
| **B. Outflows (Inflows) of Resources due to Assets** | | |
| 1. Net difference between projected and actual earnings on pension plan investments (gains) or losses | $ | 1,466,454 |
| 2. Recognition period for Assets {in years} | | 5.0000 |
| 3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets | $ | 293,291 |
| 4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets | $ | 1,173,163 |

# STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

**A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense**

| | Outflows of Resources | Inflows of Resources | Net Outflows of Resources |
|---|---|---|---|
| 1. Due to Liabilities | $ 715,342 | $ 248,895 | $ 466,447 |
| 2. Due to Assets | 415,942 | 317,315 | 98,627 |
| **3. Total** | $ 1,131,284 | $ 566,210 | $ 565,074 |

**B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense**

| | Outflows of Resources | Inflows of Resources | Net Outflows of Resources |
|---|---|---|---|
| 1. Differences between expected and actual experience | $ 24,031 | $ 248,895 | $ (224,864) |
| 2. Assumption Changes | 691,311 | - | 691,311 |
| 3. Net Difference between projected and actual earnings on pension plan investments | 415,942 | 317,315 | 98,627 |
| **4. Total** | $ 1,131,284 | $ 566,210 | $ 565,074 |

**C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses**

| | Deferred Outflows of Resources | Deferred Inflows of Resources | Net Deferred Outflows of Resources |
|---|---|---|---|
| 1. Differences between expected and actual experience | $ 24,030 | $ 659,589 | $ (635,559) |
| 2. Assumption Changes | 1,751,180 | - | 1,751,180 |
| 3. Net Difference between projected and actual earnings on pension plan investments | 1,541,117 | 634,630 | 906,487 |
| **4. Total** | $ 3,316,327 | $ 1,294,219 | $ 2,022,108 |

**D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses**

| Year Ending June 30 | Net Deferred Outflows of Resources |
|---|---|
| 2017 | $ 565,074 |
| 2018 | 379,667 |
| 2019 | 784,080 |
| 2020 | 293,287 |
| 2021 | - |
| Thereafter | - |
| **Total** | $ 2,022,108 |

## STATEMENT OF FIDUCIARY NET POSITION AS OF JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | Market Value | |
|---|---|---|
| **Assets in Trust** | **June 30, 2016** | **June 30, 2015** |
| Cash, equivalents, short term securities | $ 371,576 | $ 355,041 |
| Fixed income | 4,437,241 | 4,364,607 |
| Equity | 10,849,195 | 11,528,261 |
| SBI Alternative | 2,300,707 | 2,288,787 |
| Other | 7,014 | 7,382 |
| **Total Assets in Trust** | **$ 17,965,733** | **$ 18,544,078** |
| | | |
| Assets Receivable | 41,539 * | 46,518 ** |
| Amounts Payable | (12,363) | (8,801) |
| **Net Position Restricted for Pensions** | **$ 17,994,909** | **$ 18,581,795** |

* *Includes $31 million Employer Supplemental Contribution to be paid in July and December 2016.*
** *Includes $31 million Employer Supplemental Contribution paid September 2015.*

# STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| **Change in Assets** | | **Market Value** | |
|---|---|---|---|
| **Year Ending** | | **June 30, 2016** | **June 30, 2015** |
| 1. | Fund balance at market value at beginning of year | $ 18,581,795 | $ 17,404,822 |
| 2. | Contributions | | |
| | a. Member | 375,291 | 353,765 |
| | b. Employer | 459,978 * | 435,115 ** |
| | c. Other sources | 6,000 | 0 |
| | d. Total contributions | 841,269 | 788,880 |
| 3. | Investment income | | |
| | a. Investment income/(loss) | 3,160 | 803,212 |
| | b. Investment expenses | (24,011) | (25,708) |
| | c. Net subtotal | (20,851) | 777,504 |
| 4. | Other | 431 | 278 |
| **5.** | **Total additions:** *(2.d.) + (3.c.) + (4.)* | **$ 820,849** | **$ 1,566,662** |
| 6. | Benefits Paid | | |
| | a. Annuity benefits | (1,359,176) | (1,235,303) |
| | b. Refunds | (37,209) | (35,655) |
| | c. Total benefits paid | (1,396,385) | (1,270,958) |
| 7. | Expenses | | |
| | a. Other | 0 | 0 |
| | b. Administrative | (11,350) | (10,367) |
| | c. Total expenses | (11,350) | (10,367) |
| **8.** | **Total deductions:** *(6.c.) + (7.c.)* | **(1,407,735)** | **(1,281,325)** |
| 9. | Net increase (decrease) in net position: *(5) + (8)* | (586,886) | 285,337 |
| **10.** | **Transfer between funds** | **$ 0** | 891,636 |
| **11.** | **Net position restricted for pensions** | **$ 17,994,909** | **$ 18,581,795** |
| 12. | Approximate return on market value of assets | -0.2% | 4.4% |

* *Includes $31 million Employer Supplemental Contribution to be paid in July and December 2016.*
** *Includes $31 million Employer Supplemental Contribution paid September 2015.*

# SECTION C

## REQUIRED SUPPLEMENTARY INFORMATION

# SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS
## CURRENT PERIOD
## FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | |
|---|---|---|
| **A. Total pension liability** | | |
| 1. Service Cost | $ | 434,551 |
| 2. Interest on the Total Pension Liability | | 1,839,388 |
| 3. Changes of benefit terms | | 0 |
| 4. Difference between expected and actual experience of the Total Pension Liability* | | (647,197) |
| 5. Changes of assumptions | | 2,119,742 |
| 6. Benefit payments, including refunds of employee contributions | | (1,396,385) |
| 7. Net change in total pension liability | $ | 2,350,099 |
| 8. Total pension liability – beginning July 1, 2015 | | 23,764,314 |
| 9. Total pension liability – ending June 30, 2016 | **$** | **26,114,413** |
| **B. Plan fiduciary net position** | | |
| 1. Contributions – employer | $ | 465,978 |
| 2. Contributions – employee | | 375,291 |
| 3. Net investment income | | (20,851) |
| 4. Benefit payments, including refunds of employee contributions | | (1,396,385) |
| 5. Pension Plan Administrative Expense | | (11,350) |
| 6. Other | | 431 |
| 7. Net change in plan fiduciary net position | $ | (586,886) |
| 8. Plan fiduciary net position – beginning July 1, 2015 | | 18,581,795 |
| 9. Plan fiduciary net position – ending June 30, 2016 | **$** | **17,994,909** |
| **C. Net pension liability** | **$** | **8,119,504** |
| **D. Plan fiduciary net position as a percentage of the total pension liability** | | **68.91%** |
| **E. Covered-employee payroll** | **$** | **5,773,708** |
| **F. Net pension liability as a percentage of covered-employee payroll** | | **140.63%** |

** Includes impact of changes in expected timing of future COLA increases.*

# Schedules of Required Supplementary Information

## Schedule of Changes in Net Pension Liability and Related Ratios Multiyear (Dollars in Thousands)

### Last 10 Fiscal Years (which may be built prospectively)

| Fiscal year ending June 30, | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Pension Liability** | | | | | | | | | | |
| Service Cost | $ 434,551 | $ 421,602 | $ 388,391 | | | | | | | |
| Interest on the Total Pension Liability | 1,839,388 | 1,712,534 | 1,591,756 | | | | | | | |
| Benefit Changes | - | 1,147,198 | - | | | | | | | |
| Difference between Expected and Actual Experience | (647,197) | (348,383) | 96,123 | | | | | | | |
| Assumption Changes | 2,119,742 | - | 645,499 | | | | | | | |
| Benefit Payments | (1,359,176) | (1,235,303) | (1,109,866) | | | | | | | |
| Refunds | (37,209) | (35,655) | (38,264) | | | | | | | |
| **Net Change in Total Pension Liability** | 2,350,099 | 1,661,993 | 1,573,639 | | | | | | | |
| **Total Pension Liability - Beginning** | 23,764,314 | 22,102,321 | 20,528,682 | | | | | | | |
| **Total Pension Liability - Ending (a)** | $ 26,114,413 | $ 23,764,314 | $ 22,102,321 | | | | | | | |
| **Plan Fiduciary Net Position** | | | | | | | | | | |
| Employer Contributions | $ 465,978 | $ 435,115 | $ 382,251 | | | | | | | |
| Employee Contributions | 375,291 | 353,765 | 334,495 | | | | | | | |
| Pension Plan Net Investment Income | (20,851) | 777,504 | 2,760,854 | | | | | | | |
| Benefit Payments | (1,359,176) | (1,235,303) | (1,109,866) | | | | | | | |
| Refunds | (37,209) | (35,655) | (38,264) | | | | | | | |
| Pension Plan Administrative Expense | (11,350) | (10,367) | (9,861) | | | | | | | |
| Other | 431 | 891,914 | 605 | | | | | | | |
| **Net Change in Plan Fiduciary Net Position** | (586,886) | 1,176,973 | 2,320,214 | | | | | | | |
| **Plan Fiduciary Net Position - Beginning** | 18,581,795 | 17,404,822 | 15,084,608 | | | | | | | |
| **Plan Fiduciary Net Position - Ending (b)** | $ 17,994,909 | $ 18,581,795 | $ 17,404,822 | | | | | | | |
| **Net Pension Liability - Ending (a) - (b)** | 8,119,504 | 5,182,519 | 4,697,499 | | | | | | | |
| **Plan Fiduciary Net Position as a Percentage of Total Pension Liability** | 68.91 % | 78.19 % | 78.75 % | | | | | | | |
| **Covered-employee payroll** | $ 5,773,708 | $ 5,549,255 | $ 5,351,920 | | | | | | | |
| **Net Pension Liability as a Percentage of covered-employee payroll** | 140.63 % | 93.39 % | 87.77 % | | | | | | | |

**Notes to Schedule:**

N/A

# Schedules of Required Supplementary Information
# Schedule of the Net Pension Liability Multiyear
# (Dollars in Thousands)

## Last 10 Fiscal Years (which may be built prospectively)

| FY Ending June 30, | Total Pension Liability | Plan Net Position | Net Pension Liability | Plan Net Position as a % of Total Pension Liability | Covered Payroll | Net Pension Liability as a % of Covered Payroll |
|---|---|---|---|---|---|---|
| 2007 | | | $ - | | | |
| 2008 | | | - | | | |
| 2009 | | | - | | | |
| 2010 | | | - | | | |
| 2011 | | | - | | | |
| 2012 | | | - | | | |
| 2013 | | | - | | | |
| 2014 | $ 22,102,321 | $ 17,404,822 | $ 4,697,499 | 78.75% | $ 5,351,920 | 87.77% |
| 2015 | 23,764,314 | 18,581,795 | 5,182,519 | 78.19% | 5,549,255 | 93.39% |
| 2016 | 26,114,413 | 17,994,909 | 8,119,504 | 68.91% | 5,773,708 | 140.63% |

## SCHEDULE OF CONTRIBUTIONS MULTIYEAR *(DOLLARS IN THOUSANDS)*

## Last 10 Fiscal Years

| FY Ending June 30, | Actuarially Determined Contribution | Actual Contribution | Contribution Deficiency (Excess) | Covered Payroll | Actual Contribution as a % of Covered Payroll |
|---|---|---|---|---|---|
| 2007 | $ 335,698 | $ 283,419 | $ 52,279 | $ 4,448,954 | 6.37% |
| 2008 | 374,522 | 303,304 | 71,218 | 4,722,432 | 6.42 |
| 2009 | 381,151 | 328,603 | 52,548 | 4,778,708 | 6.88 |
| 2010 | 443,548 | 342,678 | 100,870 | 4,804,627 | 7.13 |
| 2011 | 321,782 | 357,596 | (35,814) | 5,079,429 | 7.04 |
| 2012 | 371,295 | 368,037 | 3,258 | 5,142,592 | 7.16 |
| 2013 | 430,773 | 372,652 | 58,121 | 5,246,928 | 7.10 |
| 2014 | 476,321 | 382,251 | 94,070 | 5,351,920 | 7.14 |
| 2015 | 523,017 | 435,115 | 87,902 | 5,549,255 | 7.84 |
| 2016 | 542,151 | 465,978 | 76,173 | 5,773,708 | 8.07 |

# NOTES TO SCHEDULE OF CONTRIBUTIONS

| | |
|---|---|
| **Valuation Date:** | June 30, 2016 |
| Notes | Actuarially determined contribution rates are calculated as of each June 30 and apply to the fiscal year beginning on the day after the measurement date. |

**Methods and Assumptions Used to Determine Contribution Rates:**

| | |
|---|---|
| Actuarial Cost Method | Entry Age Normal |
| Amortization Method | Level Percentage of Payroll, Closed |
| Remaining Amortization Period | 17 years |
| Asset Valuation Method | 5-year smoothed market; no corridor |
| Inflation | 2.75% |
| Payroll Growth | 3.50% |
| Salary Increases | 3.50% to 11.50% including inflation |
| Investment Rate of Return | 8.00% |
| Retirement Age | Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2016 valuation pursuant to an experience study of the period 2008 - 2015. |
| Mortality | RP-2014 annuitant generational mortality table, projected with scale MP-2015 from a base year of 2014, white collar adjustment, set forward two years for males and rates adjusted by a factor of 0.90 for females. |

**Other Information:**

| | |
|---|---|
| Notes | The plan is assumed to pay a 2.5% post retirement benefit increase beginning January 1, 2053.<br>See separate funding report as of July 1, 2016 for additional detail. |

## SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

## Last 10 Fiscal Years

| FY Ending June 30, | Annual Return[1] |
|---|---|
| 2007 | |
| 2008 | |
| 2009 | |
| 2010 | |
| 2011 | |
| 2012 | |
| 2013 | |
| 2014 | |
| 2015 | |
| 2016 | |

[1] *Annual money-weighted rate of return, net of investment expenses.*

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

# SECTION D

## ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

## ASSET ALLOCATION

| Asset Class | Target Allocation | Long-Term Expected Real Rate of Return |
|---|---|---|
| Domestic Fixed Income | | |
| International Fixed Income | | |
| Domestic Equity | | |
| International Equity | | |
| Private Equity | | |
| Real Estate | | |
| Commodities | | |
| Cash | | |
| **Total** | | |

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

**Single Discount Rate**

A single discount rate of 7.50% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 7.50%. The projection of cash flows used to determine this single discount rate assumed that plan member, employer, and state contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 7.50%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher:

**SENSITIVITY OF NET PENSION LIABILITY**
**TO THE SINGLE DISCOUNT RATE ASSUMPTION**
*(Dollars in Thousands)*

| | 1% Decrease 6.50% | Current Single Discount Rate Assumption 7.50% | 1% Increase 8.50% |
|---|---|---|---|
| Total Pension Liability | $ 29,527,011 | $ 26,114,413 | $ 23,303,361 |
| Net Position Restricted for Pensions | 17,994,909 | 17,994,909 | 17,994,909 |
| Net Pension Liability | **$ 11,532,102** | **$ 8,119,504** | **$ 5,308,452** |

# GASB Statement No. 68 Reconciliation (Dollars in Thousands)
## Current Reporting Period

| | Total Pension Liability (a) | Plan Fiduciary Net Position (b) | Net Pension Liability (a) - (b) | Current Period: Deferred Outflows | Current Period: Deferred Inflows | Current Period: Pension Expense* |
|---|---|---|---|---|---|---|
| **Balance Beginning of Year** | **$ 23,764,314** | **$ 18,581,795** | **$ 5,182,519** | | | |
| **Changes for the Year:** | | | | | | |
| Service Cost | $ 434,551 | | $ 434,551 | | | $ 434,551 |
| Interest on Total Pension Liability | 1,839,388 | | 1,839,388 | | | 1,839,388 |
| Interest on Fiduciary Net Position | | $ 1,445,603 | (1,445,603) | | | (1,445,603) |
| Changes in Benefit Terms | - | | - | | | - |
| Liability Experience Gains and Losses | (647,197) | | (647,197) | | $ 485,398 | (161,799) |
| Changes in Assumptions | 2,119,742 | | 2,119,742 | $ 1,589,806 | | 529,936 |
| Contributions - Employer | | 465,978 | (465,978) | | | |
| Contributions - Employees | | 375,291 | (375,291) | | | (375,291) |
| Asset Gain/(Loss) | | (1,466,454) | 1,466,454 | $ 1,173,163 | | 293,291 |
| Benefit Payouts | (1,396,385) | (1,396,385) | - | | | - |
| Administrative Expenses | | (11,350) | 11,350 | | | 11,350 |
| Other | | 431 | (431) | | | (431) |
| **Net Changes** | **$ 2,350,099** | **$ (586,886)** | **$ 2,936,985** | **$ 2,762,969** | **$ 485,398** | **$ 1,125,392** |
| **Balance End of Year** | **$ 26,114,413** | **$ 17,994,909** | **$ 8,119,504** | | | |

** Pension Expense from Experience in the Current Reporting Period.*

# GASB Statement No. 68 Reconciliation (Dollars in Thousands)
## Current and Prior Reporting Periods

| | Total Pension Liability (a) | Plan Fiduciary Net Position (b) | Net Pension Liability (a) - (b) | Deferred Outflows | Deferred Inflows | Net Deferred Outflows Prior Year | Total Pension Expense* |
|---|---|---|---|---|---|---|---|
| **Balance Beginning of Year** | **$ 23,764,314** | **$ 18,581,795** | **$ 5,182,519** | | | | |
| **Changes for the Year:** | | | | | | | |
| Service Cost | $ 434,551 | | $ 434,551 | | | | $ 434,551 |
| Interest on Total Pension Liability | 1,839,388 | | 1,839,388 | | | | 1,839,388 |
| Interest on Fiduciary Net Position | | $ 1,445,603 | (1,445,603) | | | | (1,445,603) |
| Changes in Benefit Terms | - | | - | | | | - |
| Liability Experience Gains and Losses | (647,197) | | (647,197) | $ 24,030 | $ 659,589 | $ (213,226) | (224,864) |
| Changes in Assumptions | 2,119,742 | | 2,119,742 | 1,751,180 | | 322,749 | 691,311 |
| Contributions - Employer | | 465,978 | (465,978) | | | | |
| Contributions - Employees | | 375,291 | (375,291) | | | | (375,291) |
| Asset Gain/(Loss) | | (1,466,454) | 1,466,454 | 1,541,117 | 634,630 | (461,340) | 98,627 |
| Benefit Payouts | (1,396,385) | (1,396,385) | - | | | | |
| Administrative Expenses | | (11,350) | 11,350 | | | | 11,350 |
| Other | | 431 | (431) | | | | (431) |
| **Net Changes** | **$ 2,350,099** | **$ (586,886)** | **$ 2,936,985** | | | | **$ 1,029,038** |
| **Balance End of Year** | **$ 26,114,413** | **$ 17,994,909** | **$ 8,119,504** | **$ 3,316,327** | **$ 1,294,219** | **$ (351,817)** | |

** Pension Expense from Experience in the Current and Prior Reporting Periods.*

# SUMMARY OF POPULATION STATISTICS

| | | Terminated | | Recipients | | | |
|---|---|---|---|---|---|---|---|
| | Actives | Deferred Retirement | Other Non-Vested | Service Retirement | Disability Retirement | Survivor | Total |
| **GERP Members on 7/1/2015** | **145,650** | **51,605** | **125,366** | **78,372** | **3,801** | **8,419** | **413,213** |
| New members | 19,390 | 0 | 0 | 0 | 0 | 0 | **19,390** |
| Return to active | 2,918 | (980) | (1,938) | 0 | 0 | 0 | **0** |
| Terminated non-vested | (8,810) | 0 | 8,810 | 0 | 0 | 0 | **0** |
| Service retirements | (2,956) | (2,657) | 0 | 5,613 | 0 | 0 | **0** |
| Terminated deferred | (4,952) | 4,952 | 0 | 0 | 0 | 0 | **0** |
| Terminated refund/transfer | (2,154) | (838) | (1,170) | 0 | 0 | 0 | **(4,162)** |
| Deaths | (201) | (140) | (316) | (2,145) | (156) | (509) | **(3,467)** |
| New beneficiary | 0 | 0 | 0 | 0 | 0 | 583 | **583** |
| Disabled | (112) | 0 | 0 | 0 | 112 | 0 | **0** |
| Data adjustments | (28) | 574 | 1,664 | 71 | 73 | 54 | **2,408** |
| Net change | 3,095 | 911 | 7,050 | 3,539 | 29 | 128 | **14,752** |
| **GERP Members on 6/30/2016** | **148,745** | **52,516** | **132,416** | **81,911** | **3,830** | **8,547** | **427,965** |

# SECTION E

## SUMMARY OF BENEFITS

## SUMMARY OF PLAN PROVISIONS - BASIC

Following is a summary of the major plan provisions used in the valuation of this report. PERA is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| **Plan year** | July 1 through June 30 |
| **Eligibility** | A public employee who is not covered under the Social Security Act. General exceptions are employees covered by other public funds, certain part-time employees and full-time students under age 23. |
| **Contributions** | Shown as a percent of salary:<br><br><u>Member</u> 9.10% of salary<br><u>Employer</u> 11.78% of salary<br><br>Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h). |
| **Allowable service** | Service during which member contributions were made. May also include certain leaves of absence and military service. |
| **Salary** | Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leaves and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts and employer-paid deferred compensation deposits, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage. |
| **Average salary** | Average of the five highest successive years of annual salary. Average salary is based on all Allowable Service if less than five years. |
| **Vesting** | Hired before July 1, 2010: 100% vested after 3 years of Allowable Service.<br><br>Hired after June 30, 2010: 100% vested after 5 years of Allowable Service. (Not applicable since all Basic members were hired before 1968.) |
| **Retirement** | |
| <u>Normal retirement benefit</u> | |
| Age/service requirement | Age 65 and vested. Proportionate retirement annuity is available at age 65 and one year of Allowable Service. |
| Amount | 2.70% of Average Salary for each year of Allowable Service. |
| <u>Early retirement benefit</u> | |
| Age/service requirement | (a.) Age 55 and vested.<br>(b.) Any age with 30 years of Allowable Service.<br>(c.) Rule of 90: Age plus Allowable Service totals 90. |

## SUMMARY OF PLAN PROVISIONS – BASIC (CONTINUED)

**Retirement (Continued)**

Early retirement benefit (Continued)

| | |
|---|---|
| Age/service requirement | The greater of (a) or (b): |
| Amount | (a.) 2.20% of Average Salary for each of the first ten years of Allowable Service and 2.70% of Average Salary for each subsequent year with reduction of 0.25% for each month if the Member is under age 65 at time of retirement and has less than 30 years of Allowable Service or if the Member is under age 62 and has 30 or more years of Allowable Service. No reduction if age plus years of Allowable Service totals 90.<br><br>(b.) 2.70% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the Member is under age 65. |
| Form of payment | Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are:<br><br>25%, 50%, 75% or 100% Joint and Survivor. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan. |
| Benefit increases | Benefit recipients receive a future annual 1.00% post-retirement benefit increase. If the funding ratio reaches 90% for two consecutive years, the benefit increase will revert to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.<br><br>A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. Members retired under laws in effect before July 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is the greater of $25 times each full year of Allowable Service or the difference between $400 times each full year of Allowable Service and the sum of benefits paid from any Minnesota public pension plan plus cash payments from the Social Security Administration for the preceding fiscal year July 1, 1988 through June 30, 1989. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from the fund. Effective January 1, 2002, annual lump sum payment is divided by 12 and paid as a monthly life annuity in the annuity form elected. |

## SUMMARY OF PLAN PROVISIONS – BASIC (CONTINUED)

| | |
|---|---|
| **Disability** | |
| Disability benefit | |
| Age/service requirement | Total and permanent disability before normal retirement age if vested. Since all remaining active Basic members are over normal retirement age, none are eligible for disability benefits. |
| Amount | Normal Retirement benefit based on Allowable Service and Average Salary at disability without reduction for commencement before Normal Retirement Age. Supplemental benefit of $25 per month payable to the later of the normal retirement age or the five-year anniversary of commencement of disability. The disability benefit is reduced to that amount which, when added to Workers' Compensation, does not exceed the salary the disabled Member received as of the date of the disability or the salary currently payable for the same employment position substantially similar to the one the person held as of the date of the disability, whichever is greater.<br><br>If a member becomes disabled prior to July 1, 1997 but did not commence his or her benefit before July 1, 1997, the benefit payable is calculated under the laws in effect at the time the Member became disabled and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.<br><br>Payments stop earlier if disability ceases. If death occurs prior to age 65, or within five years of disability, the surviving spouse can receive a refund or a survivor benefit. Dependent children are entitled to dependent child benefits subject to the 70.00% family maximum. Payments revert to a retirement annuity at normal retirement age. Benefits may be reduced on resumption of partial employment. |
| Form of payment | Same as for retirement. |
| Benefit increases | Same as for retirement. |
| Retirement after disability | |
| Age/service requirement | Normal retirement age. |
| Amount | Any optional annuity continues. Otherwise, the larger of the disability benefit paid before normal retirement age or the normal retirement benefit available at normal retirement age, or an actuarially equivalent optional annuity. |
| Benefit increases | Same as for retirement. |

## SUMMARY OF PLAN PROVISIONS - BASIC (CONTINUED)

**Death**

<u>Surviving spouse benefit</u>

| | |
|---|---|
| Age/service requirement | Active Member with 18 months of Allowable Service or while Member is receiving a disability benefit. |
| Amount | 50.00% of salary averaged over last six months. Family benefit is maximum of 70.00% and minimum of 50.00% of average salary. Benefit paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991.<br><br>If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefit as of July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.<br><br>Surviving spouse optional annuity may be elected in lieu of this benefit. |
| Benefit increases | Same as for retirement. |

<u>Surviving dependent children's benefit</u>

| | |
|---|---|
| Age/service requirement | Active Member with 18 months of Allowable Service or while Member is receiving a disability benefit. |
| Amount | 10.00% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 50.00% of salary and maximum of 70.00% of average salary. Benefits paid until child marries, dies, or attains age 18 (age 22 if full-time student).<br><br>If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Benefit increases | Same as for retirement. |

## SUMMARY OF PLAN PROVISIONS - BASIC (CONTINUED)

| | |
|---|---|
| **Death (Continued)** | |
| Surviving spouse optional annuity | |
| Age/service requirement | Member or former Member who dies before retirement benefits commence and other survivor annuity is waived by spouse. |
| Amount | Survivor's payment of the 100% joint and survivor benefit the Member could have elected if terminated or an actuarial equivalent term certain annuity. If commencement is prior to age 65 (age 62 if 30 years of service), the benefit is reduced the same as early retirement with half the applicable reduction factor used from age 55 to the actual commencement age. If no surviving spouse, then an actuarial equivalent dependent child benefit is paid to age 20 or for five years if longer.<br><br>If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefit as of July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Benefit increases | Same as for retirement. |
| Refund of contributions with interest | |
| Age/service requirement | Member dies before receiving any retirement benefits and survivor benefits are not payable. |
| Amount | The excess of the Member's contributions with 6.00% interest until June 30, 2011; 4.00% interest thereafter over any disability or survivor benefits paid. |
| **Termination** | |
| Refund of contributions | |
| Age/service requirement | Termination of public service. |
| Amount | If member terminated before July 1, 2011, member's contributions credited with 6% interest compounded annually prior to July 1, 2011 and 4% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4% interest compounded annually.<br><br>A deferred annuity may be elected in lieu of a refund if three or more years of Allowable Service. |

## SUMMARY OF PLAN PROVISIONS - BASIC (CONTINUED)

**Termination (Continued)**

Deferred benefit

| | |
|---|---|
| Age/service requirement | Fully vested. |
| Amount | Benefit computed under law in effect at termination and increased by the following "augmentation" percentage compounded annually for terminations prior to 2012:<br><br>(a.) 0.00% before July 1, 1971;<br>(b.) 5.00% from July 1, 1971 to January 1, 1981;<br>(c.) 3.00% thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012;<br>(d.) 5.00% thereafter until the earlier of the date the annuity begins and January 1, 2012; and<br>(e.) 1.00% from January 1, 2012 thereafter.<br><br>Members who terminate after 2011 will receive no future augmentation.<br><br>Members active with a public employer the day prior to the privatization of the employer become vested immediately and receive enhanced augmentation (unless the enhancement results in a net loss to the Plan). Amount is payable at a normal or early retirement. Augmentation equals 2.00% compounded annually, unless the enhancement results in a net loss to the Plan, in which case augmentation equals 1.00% compounded annually. If privatization occurred prior to January 1, 2011, augmentation occurs at the rate of 4.00% compounded annually through the year the Member turns age 55 and 6.00% thereafter until the annuity begins. If privatization occurred prior to January 1, 2007 (or January 1, 2008 for Hutchinson Area Health Care), augmentation occurs at the rate of 5.50% compounded annually through the year the Member turns age 55 and 7.50% thereafter until the annuity begins.<br><br>If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997 and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Form of payment | Same as for retirement. |
| **Optional form conversion factors** | Actuarially equivalent factors based on the RP-2000 mortality table for healthy annuitants, white collar adjustment, projected to 2025, females set back two years and no set back for males, blended 45% males and 7.50% interest. |

## SUMMARY OF PLAN PROVISIONS - BASIC (CONCLUDED)

| | |
|---|---|
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br>(a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or<br>(b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010).<br>Other requirements for combined service include:<br>(a.) Member must have at least six months of allowable service credit in each plan worked under; and<br>(b.) Member may not be in receipt of a benefit from another plan.<br>Members who meet the above requirements must have their benefit based on the following:<br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement; and<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |
| **Changes in plan provisions** | There have been no changes to plan provisions since the previous valuation. |

## SUMMARY OF PLAN PROVISIONS - COORDINATED

Following is a summary of the major plan provisions used in the valuation of this report. PERA is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| **Plan year** | July 1 through June 30 |
| **Eligibility** | A public employee who is covered under the Social Security Act. General exceptions are employees covered by other public funds, certain part-time employees and full-time students under age 23. City managers and persons holding certain elective office positions may choose to become Members. |
| **Contributions**<br>Effective date | Shown as a percent of salary:<br><br>**Member** / **Employer** |
| January 1, 2015 | 6.50% / 7.50%<br><br>Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h). |
| **Allowable service** | Service during which member contributions are deducted. May also include certain leaves of absence and military service. |
| **Salary** | Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leave and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts and employer-paid deferred compensation deposits, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage. |
| **Average salary** | Average of the five highest successive years of annual salary. Average salary is based on all Allowable Service if less than five years. |
| **Vesting** | Hired before July 1, 2010: 100% vested after three years of Allowable Service.<br><br>Hired after June 30, 2010: 100% vested after five years of Allowable Service. |
| **Retirement**<br>Normal retirement benefit<br>Age/service requirement | <br><br>First hired before July 1, 1989:<br><br>(a.) Age 65 and vested.<br>(b.) Proportionate retirement annuity is available at age 65 and one year of Allowable Service. |
| Amount | 1.70% of Average Salary for each year of Allowable Service. |

## SUMMARY OF PLAN PROVISIONS – COORDINATED (CONTINUED)

**Retirement (Continued)**

Normal retirement benefit (Continued)

| | |
|---|---|
| Age/service requirement | First hired after June 30, 1989:<br>(a.) The greater of age 65 or the age eligible for full Social Security retirement benefits but no later than age 66 and vested.<br>(b.) Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service. |
| Amount | 1.70% of Average Salary for each year of Allowable Service. |

Early retirement benefit

| | |
|---|---|
| Age/service requirement | First hired before July 1, 1989:<br>(a.) Age 55 and vested.<br>(b.) Any age with 30 years of Allowable Service.<br>(c.) Rule of 90: Age plus Allowable Service totals 90.<br><br>First hired after June 30, 1989:<br>(a.) Age 55 and vested. |
| Amount | First hired before July 1, 1989:<br>The greater of (a) or (b):<br>(a.) 1.20% of Average Salary for each of the first ten years of Allowable Service and 1.70% of Average Salary for each subsequent year with reduction of 0.25% for each month the Member is under age 65 at time of retirement or under age 62 if 30 years of Allowable Service. No reduction if age plus years of Allowable Service totals 90.<br>(b.) 1.70% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the Member is under age 65.<br><br>First hired after June 30, 1989:<br>(a.) 1.70% of Average Salary for each year of Allowable Service assuming augmentation to normal retirement age at 3.00% per year (2.50% if hired after June 30, 2006) and actuarial reduction for each month the Member is under normal retirement age. |
| Form of payment | Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are:<br>25%, 50%, 75% or 100% Joint and Survivor . If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan. |

## SUMMARY OF PLAN PROVISIONS – COORDINATED (CONTINUED)

| | |
|---|---|
| **Retirement (Continued)** | |
| Benefit increases | Benefit recipients receive a future annual 1.00% post-retirement benefit increase. If the funding ratio reaches 90% for two consecutive years, the benefit increase will revert to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.<br><br>A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase.<br><br>Members retired under laws in effect before July 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is $25 times each full year of Allowable Service. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from the fund. |
| **Disability** | |
| Disability benefit | |
| Age/service requirement | Total and permanent disability before normal retirement age if vested. |
| Amount | Normal Retirement benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age. The disability benefit is reduced to that amount which, when added to Workers' Compensation, does not exceed the salary the disabled Member received as of the date of the disability or the salary currently payable for the same employment position substantially similar to the one the person held as of the date of the disability, whichever is greater.<br><br>If a Member becomes disabled prior to July 1, 1997 but did not commence his or her benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.<br><br>Payments stop if disability ceases or death occurs. Payments change to a retirement annuity at normal retirement age. Benefits may be reduced on resumption of partial employment. |
| Form of payment | Same as for retirement. |
| Benefit increases | Same as for retirement. |

## SUMMARY OF PLAN PROVISIONS – COORDINATED (CONTINUED)

| | |
|---|---|
| **Disability (Continued)** | |
| Retirement after disability | |
| Age/service requirement | Normal retirement age. |
| Amount | Any optional annuity continues. Otherwise, the larger of the disability benefit paid before normal retirement age or the normal retirement benefit available at normal retirement age, or an actuarially equivalent optional annuity. |
| Benefit increases | Same as for retirement. |
| **Death** | |
| Surviving spouse optional annuity | |
| Age/service requirement | Member or former Member who dies before retirement or disability benefits commence. |
| Amount | Survivor's payment of the 100% joint and survivor benefit the Member could have elected if terminated or an actuarial equivalent term certain annuity. If commencement is prior to age 65 (age 62 if 30 years of service), the benefit is reduced the same as early retirement with half the applicable reduction factor used from age 55 to the actual commencement age. If no surviving spouse, then an actuarial equivalent dependent child benefit is paid to age 20 or for five years if longer.<br><br>If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Benefit increases | Same as for retirement. |
| Refund of contributions | |
| Age/service requirement | Member dies before receiving any retirement benefits and survivor benefits are not payable. |
| Amount | The excess of the Member's contributions with 6.00% interest until June 30, 2011; 4.00% interest thereafter over any disability or survivor benefits paid. |
| **Termination** | |
| Refund of contributions | |
| Age/service requirement | Termination of public service. |
| Amount | If member terminated before July 1, 2011, member's contributions credited with 6.00% interest compounded annually prior to July 1, 2011 and 4.00% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4.00% interest compounded annually.<br><br>A deferred annuity may be elected in lieu of a refund if vested. |

## SUMMARY OF PLAN PROVISIONS – COORDINATED (CONTINUED)

| | |
|---|---|
| **Termination (Continued)** | |
| <u>Deferred benefit</u> | |
| Age/service requirement | Fully vested. |
| Amount | Benefit computed under law in effect at termination and increased by the following percentage (augmentation) compounded annually for terminations prior to 2012:<br><br>(a.) 0.00% before July 1, 1971;<br>(b.) 5.00% from July 1, 1971 to January 1, 1981;<br>(c.) 3.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012;<br>(d.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; or<br>(e.) 1.00% from January 1, 2012 to when the benefit begins.<br><br>Members who terminate after 2011 will receive no future augmentation.<br><br>Members active with a public employer the day prior to the privatization of the employer become vested immediately and receive enhanced augmentation (unless the enhancement results in a net loss to the Plan). Amount is payable at a normal or early retirement. Augmentation equals 2.00% compounded annually, unless the enhancement results in a net loss to the Plan, in which case augmentation equals 1.00% compounded annually. If privatization occurred prior to January 1, 2011, augmentation occurs at the rate of 4.00% compounded annually through the year the Member turns age 55 and 6.00% thereafter until the annuity begins. If privatization occurred prior to January 1, 2007 (or January 1, 2008 for Hutchinson Area Health Care), augmentation occurs at the rate of 5.50% compounded annually through the year the Member turns age 55 and 7.50% thereafter until the annuity begins.<br><br>If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997 and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Form of payment | Same as for retirement. |
| **Actuarial equivalent factors** | Actuarially equivalent factors based on the RP-2000 mortality table for healthy annuitants, white collar adjustment, projected to 2025, females set back two years and no set back for males, blended 45% males, 7.50% post-retirement interest and 8.50% pre-retirement interest. The post-retirement interest rate will change to 6.50% on the earlier of the effective date of the next mortality adjustment or July 1, 2017. |

## SUMMARY OF PLAN PROVISIONS – COORDINATED (CONCLUDED)

| | |
|---|---|
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br><br>(a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or<br>(b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010).<br><br>Other requirements for combined service include:<br><br>(a.) Member must have at least six months of allowable service credit in each plan worked under; and<br>(b.) Member may not be in receipt of a benefit from another plan.<br><br>Members who meet the above requirements must have their benefit based on the following:<br><br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement; and<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |
| **Contribution Stabilizer** | The following is a summary of contribution stabilizer provisions in Minnesota Statute 353.27:<br><br>• If a contribution sufficiency of more than 1.00% exists, member and employer contributions may be adjusted by the Board of Directors to a level necessary to maintain a 1.00% sufficiency. Member and employer contributions may not be less than the sum of normal cost and administrative expenses.<br><br>• If a contribution deficiency of at least 0.50% exists, the member and employer contribution rates may be increased by the Board of Directors to eliminate the deficiency.<br><br>• Any adjustment to the contribution rates must be reported to the Legislative Commission on Pensions and Retirement (LCPR) by January 15 following the most recent valuation report. If the LCPR does not recommend against or alter the change in rates, the adjustment becomes effective on the salary paid after the next January 1st. |
| **Changes in Plan Provisions** | There have been no changes to plan provisions since the previous valuation. |

## SUMMARY OF PLAN PROVISIONS – MINNEAPOLIS EMPLOYEES RETIREMENT FUND (MERF)

Following is a summary of the major plan provisions used in the valuation of this report. PERA is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| **Plan year** | July 1 through June 30 |
| **Eligibility/employee rule** | An employee of the City of Minneapolis, the Metropolitan Airports Commission, the Met Council/Environmental Services, the Municipal Employees Retirement Fund, and Special School District No. 1 if covered prior to July 1, 1978. Employees covered July 1, 1978 or later are covered by the Public Employees Retirement Association (PERA) Plan.<br><br>Effective July 1, 1992, licensed peace officers and firefighters who are employed by the Metropolitan Airports Commission and covered by the Minneapolis Employees Retirement Fund will receive the greater of retirement, disability, or survivor benefits under:<br><br>a) The Minneapolis Employees Retirement Fund; or<br><br>b) The Public Employees Retirement Association (PERA) Police & Fire Plan. |
| **Full consolidation** | The MERF Division fully merged with PERA's General Employees Retirement Plan, effective January 1, 2015. Upon consolidation, state and employer contributions were revised as shown herein |
| **Contributions** | |
| Member | 9.75% of salary |
| Employer | 9.75% of salary (Employer Regular Contributions)<br><br>Employer Regular and Additional Contributions will be paid as long as there are active members.<br><br>Employer Supplemental Contribution equals $31,000,000 in calendar years 2015 and 2016 and 21,000,000 in calendar years 2017 to 2031. |
| **Contribution allocation** | Employer Supplemental Contributions are allocated to the employers in proportion to their share of the actuarial accrued liability of MERF on July 1, 2009, as follows: |

| Employer | Allocation |
|---|---|
| City of Minneapolis | 54.78% |
| Minneapolis Park Board | 10.33% |
| Met Council | 1.74% |
| Metropolitan Airport Commission | 5.76% |
| Municipal Building Commission | 1.08% |
| Minneapolis School District No. 1 | 23.04% |
| Hennepin County | 3.17% |
| MnSCU | 0.10% |
| Total | 100.00% |

## SUMMARY OF PLAN PROVISIONS – MINNEAPOLIS EMPLOYEES RETIREMENT FUND (MERF) (CONTINUED)

| | |
|---|---|
| **State contributions** | The State's contribution equals $6,000,000 in 2015 and 2016, and $16,000,000 thereafter.<br><br>The State's contributions are payable by September 30 each year and end on September 15, 2031. |
| **Allowable service** | Service during which member contributions were made. Allowable Service may also include certain leaves of absence, military service and service prior to becoming a member. Allowable service also includes time on duty disability provided that the member returns to active service if the disability ceases. |
| **Salary** | All amounts of salary, wages or compensation. |
| Average salary | Average of the five highest calendar years of salary out of the last ten calendar years. |
| **Retirement** | |
| Normal retirement benefit | |
| Age/service requirement | Age 60 and 10 years of employment. Any age with 30 years of employment. Proportionate retirement annuity is available at age 65 and 1 year allowable service. |
| Amount | 2.00% of average salary for the first 10 years of allowable service plus 2.50% of average salary for each subsequent year of allowable service. |

## SUMMARY OF PLAN PROVISIONS – MINNEAPOLIS EMPLOYEES RETIREMENT FUND (MERF) (CONTINUED)

**Disability**

Disability benefit

| | |
|---|---|
| Age/service requirement | Total and permanent disability before age 60 with five years of allowable service, or no allowable service if a work-related disability. |
| Amount | 2.00% of average salary for the first 10 years of disability service plus 2.50% of average salary for each subsequent year of disability service. Disability service is the greater of (a) or (b) where:<br><br>(a.) equals allowable service plus service projected to age 60, subject to a maximum of 22 years, and<br>(b.) equals allowable service.<br><br>Benefit is reduced by Workers' Compensation benefits.<br><br>Payments stop at age 60 or earlier if disability ceases or death occurs. Benefits may be reduced on resumption of partial employment. |

Disability after separation

| | |
|---|---|
| Age/service requirement | Total and permanent disability after electing to receive a retirement benefit but before age 60. |
| Amount | Actuarial equivalent of total credit to member's account. |

Retirement after disability

| | |
|---|---|
| Age/service requirement | Total and permanent disability after electing to receive a retirement benefit but before age 60. Employee is still disabled after age 60. |
| Amount | Benefit continues according to the option selected. |

# SUMMARY OF PLAN PROVISIONS – MINNEAPOLIS EMPLOYEES RETIREMENT FUND (MERF) (CONTINUED)

**Death**

Pre-retirement survivor's spouse benefit

| | |
|---|---|
| Age/service requirement | Active member with 18 months of allowable service. |
| Amount | 30% of salary averaged over the last six months to the surviving spouse plus 10% of salary averaged over the last six months to each surviving child. Maximum benefit is $900 per month. |

Pre-retirement survivor's spouse annuity

| | |
|---|---|
| Age/service requirement | Active member or former member who dies before retirement with 20 years of allowable service. |
| Amount | Actuarial equivalent of a single life annuity which would have been paid as a retirement benefit on the date of death without regard to eligibility age for retirement benefit. If there is no surviving spouse, the designated beneficiary may be a dependent child or dependent parent. |

Refund of accumulated city contributions

| | |
|---|---|
| Age/service requirement | Active member or former member dies after 10 years of allowable service and prior to retirement. |
| Amount | Present value of the City's annual installments of $60 or, in the case of a former member, the net accumulation of city deposits. This benefit is not payable if survivor's benefits are paid. |

Lump sum

| | |
|---|---|
| Age/service requirement | Death prior to service or disability retirement without an eligible surviving beneficiary. |
| Amount | $750 with less than 10 years allowable service, or $1,500 with 10 or more years of allowable service. |

Refund of member contributions at death

| | |
|---|---|
| Age/service requirement | Active member or former member dies before retirement. |
| Amount | The excess of the member's contributions (exclusive of the contributions to the survivor's account) plus interest to the date of death. |

## SUMMARY OF PLAN PROVISIONS – MINNEAPOLIS EMPLOYEES RETIREMENT FUND (MERF) (CONCLUDED)

| | |
|---|---|
| **Termination** | |
| Deferred benefit | |
| Age/service requirement | Three years of allowable service. |
| Amount | Benefit computed under law in effect at termination and increased by the following percentage (augmentation), compounded annually:<br>(a.) 0.00% prior to July 1, 1971,<br>(b.) 5.00% from July 1, 1971 to January 1, 1981, and<br>(c.) 3.00% thereafter until the annuity begins.<br>Amount is payable at or after age 60. |
| Refund of member contributions upon termination | |
| Age/service requirement | Termination of public service. |
| Amount | Member's contributions with interest. A deferred annuity may be elected in lieu of a refund if vested. |
| **Form of payment** | ▪ Life annuity.<br>▪ Life annuity with 3, 5, 10 or 15 years guaranteed.<br>▪ Life annuity with lump sum death benefit.<br>▪ Joint & Survivor (with or without bounce back feature). |
| **Optional form conversion factors** | 1986 PET mortality table with a one year setback, blended 50% male and 50% female, and 5% interest. |
| **Two dollar bill and annuity** | Optional Two Dollar Bill money purchase annuity available at age 55 with 20 years of service if member had service prior to June 28, 1973. According to PERA, this option is rarely utilized. We have assumed that remaining active members will not elect this optional benefit. |
| **Benefit increases** | Benefit recipients receive future annual 1.00% benefit increases. If the accrued liability funding ratio of the General Employees Retirement Plan reaches 90% (on a market value of assets basis) for two consecutive years, the benefit increase will change to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%. |
| **Changes in plan provisions** | There have been no changes to plan provisions since the previous valuation. |

# SECTION F

## ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS USED FOR THE DETERMINATION OF TOTAL PENSION LIABILITY AND RELATED VALUES

# ACTUARIAL METHODS USED FOR THE DETERMINATION OF TOTAL PENSION LIABILITY AND RELATED VALUES

**Actuarial Cost Method**

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were 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 Total Pension Liability.

**Valuation of Future Post-Retirement Benefit Increases**

Benefit recipients receive a future annual 1.00% post-retirement benefit increase. If the funding ratio reaches 90% (based on a 2.50% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns of 7.50%
- Liabilities and normal cost based on statutory funding assumptions
    - Discount rate of 8.00%
    - Statutory salary increases (rate of 11.50% at year 1 declining to 3.50% at years 26 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 1.00% per year until the funding ratio threshold required to pay a 2.50% postretirement benefit increase is reached
- Current statutory contributions (i.e. not including potential contribution increases under the contribution stabilizer statutes) as directed by PERA

Based on these assumptions and methods, the projection indicates that this plan is not expected to attain the funding ratio threshold required to pay a 2.50% postretirement benefit increase within the next 75 years. A 1.00% postretirement benefit increase assumption for all years is reflected in our calculations.

**Asset Valuation Method**

Fair value of assets.

## SUMMARY OF ACTUARIAL ASSUMPTIONS – BASIC AND COORDINATED

The following assumptions were used in valuing the liabilities and benefits under the plan. The assumptions are based on the last experience study dated June 30, 2015, a review of inflation and investment assumptions, dated September 11, 2014, and a recent asset liability study obtained by the SBI.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment. We note that the LCPR has recently completed a review of this assumption. This review recommended changes to this assumption, expected to be effective at a future date.

| | |
|---|---|
| Investment return | 7.50% per annum. |
| Single Discount Rate | 7.50% per annum. |
| Benefit increases after retirement | 1.00% per annum. |
| Salary increases | Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service earned during the year. |
| Inflation | 2.50% per year. |
| Payroll growth | 3.25% per year. |
| Mortality rates | |
| Healthy pre-retirement | RP-2014 Employee Mortality Table, adjusted for white collar and mortality improvements using projection scale MP-2015, from a base year of 2014. Rates are set forward one year for males and set back one year for females. |
| Healthy post-retirement | RP-2014 Healthy Annuitant Mortality Table, adjusted for white collar and mortality improvements using projection scale MP-2015, from a base year of 2014. Rates are set forward two years for males. Female rates are multiplied by a factor of 0.90. |
| Disabled retirees | RP-2014 Disabled Mortality Table, adjusted for mortality improvements using projection scale MP-2015, from a base year of 2014. Rates are set forward one year for males and set forward six years for females. |
| Retirement | Members retiring from active status are assumed to retire according to the age related rates shown in the tables. Members who have attained the highest assumed retirement age are assumed to retire in one year. |
| Withdrawal | Service-related rates based on experience; see table of sample rates. |
| Disability | Age-related rates based on experience; see table of sample rates. |
| Allowance for combined service annuity | Liabilities for active members are increased by 0.80% and liabilities for former members are increased by 60.00% to account for the effect of some participants having eligibility for a Combined Service Annuity. |
| Administrative expenses | In the valuation year, equal to prior year administrative expenses expressed as a percentage of prior year projected payroll. In each subsequent year, equal to the initial administrative expense percentage applied to payroll for the closed group. |

## SUMMARY OF ACTUARIAL ASSUMPTIONS – BASIC AND COORDINATED (CONTINUED)

| | |
|---|---|
| Refund of contributions | Account balances accumulate interest until normal retirement dates are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit. |
| Commencement of deferred benefits | Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at Normal Retirement. |
| Percentage married | 80% of male and 70% of female active members are assumed to be married. Actual marital status is used for members in payment status. |
| Age of spouse | Males are assumed to have a beneficiary three years younger, while females are assumed to have a beneficiary two years older. For members in payment status, actual spouse date of birth is used, if provided. |
| Eligible children | Retiring members are assumed to have no dependent children. |
| Form of payment | Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows:<br><br>Males: 10% elect 25% Joint & Survivor option<br>15% elect 50% Joint & Survivor option<br>10% elect 75% Joint & Survivor option<br>35% elect 100% Joint & Survivor option<br>Females: 10% elect 25% Joint & Survivor option<br>10% elect 50% Joint & Survivor option<br>5% elect 75% Joint & Survivor option<br>15% elect 100% Joint & Survivor option<br><br>Remaining married members and unmarried members are assumed to elect the Straight Life option.<br><br>Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity. |
| Eligibility testing | Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur. |
| Decrement operation | Withdrawal decrements do not operate during retirement eligibility. Decrements are assumed to occur mid-fiscal year. |
| Service credit accruals | It is assumed that members accrue one year of service credit per year. |
| Pay increases | Pay increases are assumed to happen at the beginning of the fiscal year. This is equivalent to assuming that reported earnings are pensionable earnings for the year ending on the valuation date. |

## SUMMARY OF ACTUARIAL ASSUMPTIONS – BASIC AND COORDINATED (CONTINUED)

| | |
|---|---|
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br><u>Data for active members:</u><br>There were 2,889 members reported with a salary less than $100. We used prior year salary (1,796 members), if available; otherwise high five salary with a 10% load to account for salary increases (993 members). If neither prior year salary or high five salary was available, we assumed a value of $35,000.<br><br>There were also 2,074 members reported without a gender and 84 members reported with an invalid date of birth. We assumed a date of birth based on an entry age of 38 (the average age of new entrants in the 2015 valuation) and female gender.<br><br><u>Data for terminated members:</u><br>We calculated benefits for these members using the reported Average Salary and credited service. If Average Salary was not reported (221 members), we assumed a value of $24,000. If credited service was not reported (133 members), we assumed credited service was elapsed time from hire to termination date (88 members); otherwise nine years. If termination date was invalid or not reported (115 members), we assumed the termination date was equal to hire date plus credited service; otherwise the valuation date unless they are noted as a pre-July 1, 1989 hire, then June 30, 1989. If reported termination date occurs prior to reported hire date, the two dates were swapped.<br><br>There were 42 members reported with an invalid date of birth and 255 members reported without a gender. We assumed a date of birth of July 1, 1967 and female gender.<br><br><u>Data for retired members:</u><br>There were 95 members reported without a gender. We assumed retirees are female and beneficiaries are male. There were six members reported with an invalid date of birth. We assumed a date of birth of July 1, 1945. |
| Changes in actuarial assumptions | The assumed post-retirement benefit increase rate was changed from 1% through 2035 and 2.50% thereafter to 1.00% for all years.<br><br>The assumed investment return was changed from 7.90% to 7.50%. The single discount rate was changed from 7.90% to 7.50%<br><br>Salary increases, retirement, termination, disability, mortality, percent married, and benefit election assumptions were changed pursuant to the experience study dated June 30, 2015. The assumed future salary increases, payroll growth, and inflation were decreased by a further 0.25% from those assumptions. |

## SUMMARY OF ACTUARIAL ASSUMPTIONS – BASIC AND COORDINATED (CONTINUED)

| | Rate (%) * | | | | | |
|---|---|---|---|---|---|---|
| | Healthy Post-Retirement Mortality** | | Healthy Pre-Retirement Mortality** | | Disability Mortality** | |
| Age in 2014 | Male | Female | Male | Female | Male | Female |
| 20 | 0.03% | 0.01% | 0.03% | 0.01% | 0.07% | 0.11% |
| 25 | 0.05 | 0.02 | 0.03 | 0.01 | 0.25 | 0.26 |
| 30 | 0.07 | 0.04 | 0.03 | 0.02 | 0.56 | 0.47 |
| 35 | 0.10 | 0.07 | 0.04 | 0.02 | 0.94 | 0.71 |
| 40 | 0.15 | 0.10 | 0.05 | 0.03 | 1.36 | 0.97 |
| 45 | 0.22 | 0.14 | 0.08 | 0.05 | 1.76 | 1.25 |
| 50 | 0.32 | 0.19 | 0.13 | 0.08 | 2.10 | 1.50 |
| 55 | 0.44 | 0.24 | 0.22 | 0.13 | 2.40 | 1.76 |
| 60 | 0.60 | 0.35 | 0.37 | 0.19 | 2.74 | 2.20 |
| 65 | 0.91 | 0.59 | 0.65 | 0.29 | 3.31 | 3.03 |
| 70 | 1.54 | 0.95 | 1.15 | 0.49 | 4.26 | 4.44 |

* *Generally, mortality rates are expected to increase as age increases. These standard mortality rates have been adjusted slightly to prevent decreasing mortality rates. If the rates were not adjusted as described, we would not expect the valuation results to be materially different.*

** *The rates shown are RP-2014 mortality with age setbacks, multipliers, and white collar adjustments, if applicable. Rates are further adjusted for mortality improvements using projection scale MP-2015 (from a base year of 2014).*

| | Disability Retirement | |
|---|---|---|
| Age | Male | Female |
| 20 | 0.01% | 0.01% |
| 25 | 0.01 | 0.01 |
| 30 | 0.01 | 0.01 |
| 35 | 0.03 | 0.02 |
| 40 | 0.05 | 0.04 |
| 45 | 0.08 | 0.05 |
| 50 | 0.15 | 0.10 |
| 55 | 0.34 | 0.16 |
| 60 | 0.53 | 0.28 |
| 65 | 0.00 | 0.00 |
| 70 | 0.00 | 0.00 |

## SUMMARY OF ACTUARIAL ASSUMPTIONS – BASIC AND COORDINATED (CONCLUDED)

| | Retirement | | |
|---|---|---|---|
| **Age** | **Rule of 90 Eligible** | **Tier 1** | **Tier 2** |
| 55 | 20.0% | 5.0% | 5.0% |
| 56 | 15.0% | 5.0% | 5.0% |
| 57 | 15.0% | 5.0% | 5.0% |
| 58 | 15.0% | 6.0% | 5.0% |
| 59 | 15.0% | 7.0% | 6.0% |
| 60 | 15.0% | 8.0% | 7.0% |
| 61 | 18.0% | 10.0% | 9.0% |
| 62 | 35.0% | 20.0% | 15.0% |
| 63 | 25.0% | 20.0% | 15.0% |
| 64 | 25.0% | 25.0% | 15.0% |
| 65 | 32.5% | 32.5% | 25.0% |
| 66 | 25.0% | 25.0% | 25.0% |
| 67 | 20.0% | 20.0% | 20.0% |
| 68 | 17.5% | 17.5% | 17.5% |
| 69 | 15.0% | 15.0% | 15.0% |
| 70 | 17.5% | 17.5% | 17.5% |
| 71+ | 100.0% | 100.0% | 100.0% |

# SUMMARY OF ACTUARIAL ASSUMPTIONS – BASIC AND COORDINATED (CONCLUDED)

| Salary Scale | | | % Withdrawals | |
|---|---|---|---|---|
| Year | Increase | Year | Male | Female |
| 1 | 11.25% | 1 | 25.00% | 25.00% |
| 2 | 8.25 | 2 | 20.00 | 20.00 |
| 3 | 6.75 | 3 | 15.00 | 15.00 |
| 4 | 5.75 | 4 | 10.00 | 11.00 |
| 5 | 5.25 | 5 | 9.00 | 10.00 |
| 6 | 4.95 | 6 | 7.00 | 9.00 |
| 7 | 4.65 | 7 | 5.50 | 7.50 |
| 8 | 4.55 | 8 | 5.00 | 6.50 |
| 9 | 4.45 | 9 | 4.50 | 5.50 |
| 10 | 4.25 | 10 | 4.00 | 5.00 |
| 11 | 4.00 | 11 | 3.25 | 4.25 |
| 12 | 3.85 | 12 | 3.00 | 4.00 |
| 13 | 3.75 | 13 | 2.75 | 3.75 |
| 14 | 3.65 | 14 | 2.50 | 3.50 |
| 15 | 3.65 | 15 | 2.50 | 3.25 |
| 16 | 3.60 | 16 | 2.25 | 3.00 |
| 17 | 3.55 | 17 | 2.00 | 2.75 |
| 18 | 3.50 | 18 | 1.75 | 2.50 |
| 19 | 3.50 | 19 | 1.50 | 2.50 |
| 20 | 3.50 | 20 | 1.50 | 2.25 |
| 21 | 3.50 | 21 | 1.50 | 2.25 |
| 22 | 3.45 | 22 | 1.50 | 2.25 |
| 23 | 3.35 | 23 | 1.00 | 2.00 |
| 24 | 3.35 | 24 | 1.00 | 2.00 |
| 25 | 3.35 | 25 | 1.00 | 1.75 |
| 26+ | 3.25 | 26 | 1.00 | 1.75 |
| | | 27 | 1.00 | 1.50 |
| | | 28 | 1.00 | 1.50 |
| | | 29 | 1.00 | 1.50 |
| | | 30 | 1.00 | 1.50 |

## SUMMARY OF ACTUARIAL ASSUMPTIONS - MERF

The following assumptions were used in valuing the liabilities and benefits under the plan for MERF members only. Assumptions regarding investment return, mortality, and benefit increases are the same as shown in the Basic and Coordinated Plan assumption summary.

| | |
|---|---|
| Salary increases | Total reported pay for prior calendar year increased 1.73% (half year of 3.50%, compounded) to prior fiscal year and 3.50% annually for each future year. |
| Retirement | Active members are assumed to retire at age 61, or immediately if currently age 61 or older. |
| Withdrawal | Rates are shown in rate table. |
| Disability | Age-related rates based on experience; see table of sample rates. |
| Allowance for combined service annuity | Liabilities for active members are increased 0.20% and liabilities for former members are increased by 30.00% to account for the effect of some participants having eligibility for a Combined Service Annuity. |
| Commencement of deferred benefits | Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 60. |
| Percentage married | 66.67% of active members are assumed to be married. Actual marital status is used for members in payment status. |
| Age of spouse | Females are assumed to be three years younger than their male spouses. For members in payment status, actual spouse date of birth is used, if provided. |
| Eligible children | Retiring members are assumed to have no dependent children. |
| Form of payment | Members are assumed to elect a life annuity. |
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br>There were no members with missing or invalid dates of birth.<br><br><u>Data for active members:</u><br><br>There were no active members with missing salary or service.<br><br><u>Data for terminated members:</u><br><br>Benefits were provided by PERA for seven members. For the remaining members, we calculated benefits using the reported Average Salary, credited service and termination date from the 2015 valuation data file.<br><br><u>Data for Retired members:</u><br><br>There were no members reported with missing benefits. There was one member reported without a gender. We assumed male gender. |

## SUMMARY OF ACTUARIAL ASSUMPTIONS – MERF (CONCLUDED)

| Age | Withdrawal | | Disability Retirement | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| 20 | 21.00% | 21.00% | 0.21% | 0.21% |
| 25 | 11.00 | 11.00 | 0.21 | 0.21 |
| 30 | 5.00 | 5.00 | 0.23 | 0.23 |
| 35 | 1.50 | 1.50 | 0.30 | 0.30 |
| 40 | 1.00 | 1.00 | 0.41 | 0.41 |
| 45 | 1.00 | 1.00 | 0.61 | 0.61 |
| 50 | 1.00 | 1.00 | 0.93 | 0.93 |
| 55 | 1.00 | 1.00 | 1.60 | 1.60 |
| 60 | 1.00 | 1.00 | 0.00 | 0.00 |
| 65 | 0.00 | 0.00 | 0.00 | 0.00 |
| 70 | 0.00 | 0.00 | 0.00 | 0.00 |

# SECTION G

## CALCULATION OF THE SINGLE DISCOUNT RATE

# CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed long-term expected rate of return is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a "risk-free" rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 2.85%; and **the resulting single discount rate is 7.50%**.

The tables in this section provide background for the development of the single discount rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

# SINGLE DISCOUNT RATE DEVELOPMENT
# PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS)

| | Payroll | | | Projected Contributions | | | | |
|---|---|---|---|---|---|---|---|---|
| Fiscal Year Ending | Payroll for Current Employees | Payroll for New Employees | Total Employee Payroll | Contributions from Current Employees | Employer Contributions for Current Employees | Contributions on Future Payroll toward Current UAL* | Additional State Contributions | Total Contributions |
| 2016 | $ 5,773,708 | $ - | $ 5,773,708 | | | | | |
| 2017 | 5,892,768 | - | 5,892,768 | $ 383,030 | $ 441,958 | $ - | $ 37,000 | $ 861,988 |
| 2018 | 5,563,390 | 520,893 | 6,084,283 | 361,620 | 417,254 | 30,212 | 37,000 | 846,086 |
| 2019 | 5,273,114 | 1,008,908 | 6,282,022 | 342,752 | 395,484 | 58,517 | 37,000 | 833,753 |
| 2020 | 5,025,303 | 1,460,885 | 6,486,188 | 326,645 | 376,898 | 84,731 | 37,000 | 825,274 |
| 2021 | 4,794,149 | 1,902,840 | 6,696,989 | 311,620 | 359,561 | 110,365 | 37,000 | 818,546 |
| 2022 | 4,576,038 | 2,338,603 | 6,914,641 | 297,442 | 343,203 | 135,639 | 37,000 | 813,284 |
| 2023 | 4,366,984 | 2,772,383 | 7,139,367 | 283,854 | 327,524 | 160,798 | 37,000 | 809,176 |
| 2024 | 4,167,209 | 3,204,188 | 7,371,397 | 270,869 | 312,541 | 185,843 | 37,000 | 806,253 |
| 2025 | 3,978,878 | 3,632,089 | 7,610,967 | 258,627 | 298,416 | 210,661 | 37,000 | 804,704 |
| 2026 | 3,800,151 | 4,058,173 | 7,858,324 | 247,010 | 285,011 | 235,374 | 37,000 | 804,395 |
| 2027 | 3,629,558 | 4,484,161 | 8,113,719 | 235,921 | 272,217 | 260,081 | 37,000 | 805,219 |
| 2028 | 3,465,777 | 4,911,638 | 8,377,415 | 225,275 | 259,933 | 284,875 | 37,000 | 807,083 |
| 2029 | 3,308,326 | 5,341,355 | 8,649,681 | 215,041 | 248,124 | 309,799 | 37,000 | 809,964 |
| 2030 | 3,157,046 | 5,773,750 | 8,930,796 | 205,208 | 236,778 | 334,877 | 37,000 | 813,863 |
| 2031 | 3,010,781 | 6,210,265 | 9,221,046 | 195,701 | 225,809 | 360,195 | 37,000 | 818,705 |
| 2032 | 2,867,980 | 6,652,750 | 9,520,730 | 186,419 | 215,098 | 385,860 | - | 787,377 |
| 2033 | 2,727,368 | 7,102,786 | 9,830,154 | 177,279 | 204,553 | 411,962 | - | 793,794 |
| 2034 | 2,589,261 | 7,560,373 | 10,149,634 | 168,302 | 194,195 | 438,502 | - | 800,999 |
| 2035 | 2,454,274 | 8,025,223 | 10,479,497 | 159,528 | 184,071 | 465,463 | - | 809,062 |
| 2036 | 2,322,089 | 8,497,992 | 10,820,081 | 150,936 | 174,157 | 492,884 | - | 817,977 |
| 2037 | 2,191,606 | 8,980,128 | 11,171,734 | 142,454 | 164,370 | 520,847 | - | 827,671 |
| 2038 | 2,063,181 | 9,471,634 | 11,534,815 | 134,107 | 154,739 | 549,355 | - | 838,201 |
| 2039 | 1,936,505 | 9,973,191 | 11,909,696 | 125,873 | 145,238 | 578,445 | - | 849,556 |
| 2040 | 1,810,624 | 10,486,137 | 12,296,761 | 117,691 | 135,797 | 608,196 | - | 861,684 |
| 2041 | 1,684,627 | 11,011,779 | 12,696,406 | 109,501 | 126,347 | 638,683 | - | 874,531 |
| 2042 | 1,558,777 | 11,550,262 | 13,109,039 | 101,321 | 116,908 | 669,915 | - | 888,144 |
| 2043 | 1,434,936 | 12,100,147 | 13,535,083 | 93,271 | 107,620 | 701,809 | - | 902,700 |
| 2044 | 1,314,135 | 12,660,838 | 13,974,973 | 85,419 | 98,560 | 734,329 | - | 918,308 |
| 2045 | 1,196,019 | 13,233,141 | 14,429,160 | 77,741 | 89,701 | 767,522 | - | 934,964 |
| 2046 | 1,080,159 | 13,817,949 | 14,898,108 | 70,210 | 81,012 | 801,441 | - | 952,663 |
| 2047 | 967,340 | 14,414,956 | 15,382,296 | 62,877 | 72,550 | 836,067 | - | 971,494 |
| 2048 | 858,275 | 15,023,946 | 15,882,221 | 55,788 | 64,371 | 871,389 | - | 991,548 |
| 2049 | 754,064 | 15,644,329 | 16,398,393 | 49,014 | 56,555 | 907,371 | - | 1,012,940 |
| 2050 | 655,779 | 16,275,562 | 16,931,341 | 42,626 | 49,183 | 943,983 | - | 1,035,792 |
| 2051 | 563,493 | 16,918,116 | 17,481,609 | 36,627 | 42,262 | 981,251 | - | 1,060,140 |
| 2052 | 477,680 | 17,572,082 | 18,049,762 | 31,049 | 35,826 | 1,019,181 | - | 1,086,056 |
| 2053 | 398,739 | 18,237,640 | 18,636,379 | 25,918 | 29,905 | 1,057,783 | - | 1,113,606 |
| 2054 | 327,530 | 18,914,531 | 19,242,061 | 21,289 | 24,565 | 1,097,043 | - | 1,142,897 |
| 2055 | 265,200 | 19,602,228 | 19,867,428 | 17,238 | 19,890 | 1,136,929 | - | 1,174,057 |
| 2056 | 210,816 | 20,302,304 | 20,513,120 | 13,703 | 15,811 | 1,177,534 | - | 1,207,048 |
| 2057 | 163,795 | 21,016,001 | 21,179,796 | 10,647 | 12,285 | 1,218,928 | - | 1,241,860 |
| 2058 | 124,470 | 21,743,669 | 21,868,139 | 8,091 | 9,335 | 1,261,133 | - | 1,278,559 |
| 2059 | 92,489 | 22,486,365 | 22,578,854 | 6,012 | 6,937 | 1,304,209 | - | 1,317,158 |
| 2060 | 67,014 | 23,245,653 | 23,312,667 | 4,356 | 5,026 | 1,348,248 | - | 1,357,630 |
| 2061 | 46,983 | 24,023,345 | 24,070,328 | 3,054 | 3,524 | 1,393,354 | - | 1,399,932 |
| 2062 | 31,401 | 24,821,213 | 24,852,614 | 2,041 | 2,355 | 1,439,630 | - | 1,444,026 |
| 2063 | 19,676 | 25,640,648 | 25,660,324 | 1,279 | 1,476 | 1,487,158 | - | 1,489,913 |
| 2064 | 11,443 | 26,482,842 | 26,494,285 | 744 | 858 | 1,536,005 | - | 1,537,607 |
| 2065 | 6,274 | 27,349,075 | 27,355,349 | 408 | 471 | 1,586,246 | - | 1,587,125 |
| 2066 | 3,299 | 28,241,099 | 28,244,398 | 214 | 247 | 1,637,984 | - | 1,638,445 |

* *Contributions related to future employee payroll in excess of normal cost and expenses of 8.20% of pay.*

# SINGLE DISCOUNT RATE DEVELOPMENT
# PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS) (CONCLUDED)

| | Payroll | | | Projected Contributions | | | | |
|---|---|---|---|---|---|---|---|---|
| Fiscal Year Ending | Payroll for Current Employees | Payroll for New Employees | Total Employee Payroll | Contributions from Current Employees | Employer Contributions for Current Employees | Contributions on Future Payroll toward Current UAL* | Additional State Contributions | Total Contributions |
| 2067 | $ 1,503 | $ 29,160,838 | $ 29,162,341 | $ 98 | $ 113 | $ 1,691,329 | $ - | $ 1,691,540 |
| 2068 | 531 | 30,109,586 | 30,110,117 | 34 | 40 | 1,746,356 | - | 1,746,430 |
| 2069 | 161 | 31,088,534 | 31,088,695 | 10 | 12 | 1,803,135 | - | 1,803,157 |
| 2070 | 62 | 32,099,016 | 32,099,078 | 4 | 5 | 1,861,743 | - | 1,861,752 |
| 2071 | 21 | 33,142,277 | 33,142,298 | 1 | 2 | 1,922,252 | - | 1,922,255 |
| 2072 | 7 | 34,219,416 | 34,219,423 | - | 1 | 1,984,726 | - | 1,984,727 |
| 2073 | 2 | 35,331,552 | 35,331,554 | - | - | 2,049,230 | - | 2,049,230 |
| 2074 | - | 36,479,829 | 36,479,829 | - | - | 2,115,830 | - | 2,115,830 |
| 2075 | - | 37,665,424 | 37,665,424 | - | - | 2,184,595 | - | 2,184,595 |
| 2076 | - | 38,889,550 | 38,889,550 | - | - | 2,255,594 | - | 2,255,594 |
| 2077 | - | 40,153,461 | 40,153,461 | - | - | 2,328,901 | - | 2,328,901 |
| 2078 | - | 41,458,448 | 41,458,448 | - | - | 2,404,590 | - | 2,404,590 |
| 2079 | - | 42,805,848 | 42,805,848 | - | - | 2,482,739 | - | 2,482,739 |
| 2080 | - | 44,197,038 | 44,197,038 | - | - | 2,563,428 | - | 2,563,428 |
| 2081 | - | 45,633,441 | 45,633,441 | - | - | 2,646,740 | - | 2,646,740 |
| 2082 | - | 47,116,528 | 47,116,528 | - | - | 2,732,759 | - | 2,732,759 |
| 2083 | - | 48,647,815 | 48,647,815 | - | - | 2,821,573 | - | 2,821,573 |
| 2084 | - | 50,228,869 | 50,228,869 | - | - | 2,913,274 | - | 2,913,274 |
| 2085 | - | 51,861,308 | 51,861,308 | - | - | 3,007,956 | - | 3,007,956 |
| 2086 | - | 53,546,800 | 53,546,800 | - | - | 3,105,714 | - | 3,105,714 |
| 2087 | - | 55,287,071 | 55,287,071 | - | - | 3,206,650 | - | 3,206,650 |
| 2088 | - | 57,083,901 | 57,083,901 | - | - | 3,310,866 | - | 3,310,866 |
| 2089 | - | 58,939,128 | 58,939,128 | - | - | 3,418,469 | - | 3,418,469 |
| 2090 | - | 60,854,649 | 60,854,649 | - | - | 3,529,570 | - | 3,529,570 |
| 2091 | - | 62,832,426 | 62,832,426 | - | - | 3,644,281 | - | 3,644,281 |
| 2092 | - | 64,874,479 | 64,874,479 | - | - | 3,762,720 | - | 3,762,720 |
| 2093 | - | 66,982,900 | 66,982,900 | - | - | 3,885,008 | - | 3,885,008 |
| 2094 | - | 69,159,844 | 69,159,844 | - | - | 4,011,271 | - | 4,011,271 |
| 2095 | - | 71,407,539 | 71,407,539 | - | - | 4,141,637 | - | 4,141,637 |
| 2096 | - | 73,728,284 | 73,728,284 | - | - | 4,276,240 | - | 4,276,240 |
| 2097 | - | 76,124,453 | 76,124,453 | - | - | 4,415,218 | - | 4,415,218 |
| 2098 | - | 78,598,498 | 78,598,498 | - | - | 4,558,713 | - | 4,558,713 |
| 2099 | - | 81,152,949 | 81,152,949 | - | - | 4,706,871 | - | 4,706,871 |
| 2100 | - | 83,790,420 | 83,790,420 | - | - | 4,859,844 | - | 4,859,844 |
| 2101 | - | 86,513,609 | 86,513,609 | - | - | 5,017,789 | - | 5,017,789 |
| 2102 | - | 89,325,301 | 89,325,301 | - | - | 5,180,867 | - | 5,180,867 |
| 2103 | - | 92,228,373 | 92,228,373 | - | - | 5,349,246 | - | 5,349,246 |
| 2104 | - | 95,225,796 | 95,225,796 | - | - | 5,523,096 | - | 5,523,096 |
| 2105 | - | 98,320,634 | 98,320,634 | - | - | 5,702,597 | - | 5,702,597 |
| 2106 | - | 101,516,055 | 101,516,055 | - | - | 5,887,931 | - | 5,887,931 |
| 2107 | - | 104,815,326 | 104,815,326 | - | - | 6,079,289 | - | 6,079,289 |
| 2108 | - | 108,221,824 | 108,221,824 | - | - | 6,276,866 | - | 6,276,866 |
| 2109 | - | 111,739,034 | 111,739,034 | - | - | 6,480,864 | - | 6,480,864 |
| 2110 | - | 115,370,552 | 115,370,552 | - | - | 6,691,492 | - | 6,691,492 |
| 2111 | - | 119,120,095 | 119,120,095 | - | - | 6,908,966 | - | 6,908,966 |
| 2112 | - | 122,991,498 | 122,991,498 | - | - | 7,133,507 | - | 7,133,507 |
| 2113 | - | 126,988,722 | 126,988,722 | - | - | 7,365,346 | - | 7,365,346 |
| 2114 | - | 131,115,855 | 131,115,855 | - | - | 7,604,720 | - | 7,604,720 |
| 2115 | - | 135,377,121 | 135,377,121 | - | - | 7,851,873 | - | 7,851,873 |
| 2116 | - | 139,776,877 | 139,776,877 | - | - | 8,107,059 | - | 8,107,059 |

** Contributions related to future employee payroll in excess of normal cost and expenses of 8.20% of pay.*

# SINGLE DISCOUNT RATE DEVELOPMENT
# PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Total Contributions | Projected Benefit Payments | Projected Administrative Expenses | Projected Investment Earnings at 7.50% | Projected Ending Plan Net Position |
|---|---|---|---|---|---|---|
| | (a) | (b) | (c) | (d) | (e) | (f)=(a)+(b)-(c)-(d)+(e) |
| 2017 | $ 17,994,909 | $ 861,988 | $ 1,469,270 | $ 11,786 | $ 1,326,823 | $ 18,702,664 |
| 2018 | 18,702,664 | 846,086 | 1,539,863 | 11,127 | 1,376,744 | 19,374,504 |
| 2019 | 19,374,504 | 833,753 | 1,612,279 | 10,546 | 1,424,033 | 20,009,465 |
| 2020 | 20,009,465 | 825,274 | 1,685,583 | 10,051 | 1,468,661 | 20,607,766 |
| 2021 | 20,607,766 | 818,546 | 1,759,593 | 9,588 | 1,510,578 | 21,167,709 |
| 2022 | 21,167,709 | 813,284 | 1,840,754 | 9,152 | 1,549,408 | 21,680,495 |
| 2023 | 21,680,495 | 809,176 | 1,922,597 | 8,734 | 1,584,717 | 22,143,057 |
| 2024 | 22,143,057 | 806,252 | 2,005,420 | 8,334 | 1,616,266 | 22,551,821 |
| 2025 | 22,551,821 | 804,704 | 2,084,168 | 7,958 | 1,643,981 | 22,908,380 |
| 2026 | 22,908,380 | 804,395 | 2,158,309 | 7,600 | 1,667,995 | 23,214,861 |
| 2027 | 23,214,861 | 805,219 | 2,229,990 | 7,259 | 1,688,384 | 23,471,215 |
| 2028 | 23,471,215 | 807,084 | 2,300,239 | 6,932 | 1,705,105 | 23,676,233 |
| 2029 | 23,676,233 | 809,964 | 2,366,031 | 6,617 | 1,718,176 | 23,831,725 |
| 2030 | 23,831,725 | 813,864 | 2,427,536 | 6,314 | 1,727,728 | 23,939,467 |
| 2031 | 23,939,467 | 818,705 | 2,486,113 | 6,022 | 1,733,841 | 23,999,878 |
| 2032 | 23,999,878 | 787,377 | 2,541,258 | 5,736 | 1,735,198 | 23,975,459 |
| 2033 | 23,975,459 | 793,793 | 2,593,959 | 5,455 | 1,731,673 | 23,901,511 |
| 2034 | 23,901,511 | 800,998 | 2,643,697 | 5,179 | 1,724,571 | 23,778,204 |
| 2035 | 23,778,204 | 809,061 | 2,690,758 | 4,909 | 1,713,897 | 23,605,495 |
| 2036 | 23,605,495 | 817,976 | 2,735,642 | 4,644 | 1,699,629 | 23,382,814 |
| 2037 | 23,382,814 | 827,672 | 2,777,782 | 4,383 | 1,681,743 | 23,110,064 |
| 2038 | 23,110,064 | 838,200 | 2,814,515 | 4,126 | 1,660,331 | 22,789,954 |
| 2039 | 22,789,954 | 849,556 | 2,845,732 | 3,873 | 1,635,601 | 22,425,506 |
| 2040 | 22,425,506 | 861,683 | 2,873,740 | 3,621 | 1,607,692 | 22,017,520 |
| 2041 | 22,017,520 | 874,531 | 2,898,302 | 3,369 | 1,576,671 | 21,567,051 |
| 2042 | 21,567,051 | 888,144 | 2,920,095 | 3,118 | 1,542,593 | 21,074,575 |
| 2043 | 21,074,575 | 902,700 | 2,938,156 | 2,870 | 1,505,538 | 20,541,787 |
| 2044 | 20,541,787 | 918,308 | 2,952,027 | 2,628 | 1,465,652 | 19,971,092 |
| 2045 | 19,971,092 | 934,965 | 2,961,526 | 2,392 | 1,423,122 | 19,365,261 |
| 2046 | 19,365,261 | 952,663 | 2,968,243 | 2,160 | 1,378,097 | 18,725,618 |
| 2047 | 18,725,618 | 971,495 | 2,971,527 | 1,935 | 1,330,705 | 18,054,356 |
| 2048 | 18,054,356 | 991,547 | 2,971,092 | 1,717 | 1,281,122 | 17,354,216 |
| 2049 | 17,354,216 | 1,012,940 | 2,966,771 | 1,508 | 1,229,566 | 16,628,443 |
| 2050 | 16,628,443 | 1,035,792 | 2,955,913 | 1,312 | 1,176,382 | 15,883,392 |
| 2051 | 15,883,392 | 1,060,140 | 2,940,557 | 1,127 | 1,121,972 | 15,123,820 |
| 2052 | 15,123,820 | 1,086,056 | 2,920,706 | 955 | 1,066,696 | 14,354,911 |
| 2053 | 14,354,911 | 1,113,607 | 2,895,480 | 797 | 1,010,977 | 13,583,218 |
| 2054 | 13,583,218 | 1,142,897 | 2,863,837 | 655 | 955,348 | 12,816,971 |
| 2055 | 12,816,971 | 1,174,057 | 2,825,527 | 530 | 900,442 | 12,065,413 |
| 2056 | 12,065,413 | 1,207,048 | 2,780,791 | 422 | 846,942 | 11,338,190 |
| 2057 | 11,338,190 | 1,241,859 | 2,729,880 | 328 | 795,560 | 10,645,401 |
| 2058 | 10,645,401 | 1,278,559 | 2,672,021 | 249 | 747,086 | 9,998,776 |
| 2059 | 9,998,776 | 1,317,158 | 2,606,649 | 185 | 702,419 | 9,411,519 |
| 2060 | 9,411,519 | 1,357,630 | 2,533,697 | 134 | 662,553 | 8,897,871 |
| 2061 | 8,897,871 | 1,399,932 | 2,454,612 | 94 | 628,501 | 8,471,598 |
| 2062 | 8,471,598 | 1,444,026 | 2,371,464 | 63 | 601,217 | 8,145,314 |
| 2063 | 8,145,314 | 1,489,912 | 2,285,001 | 39 | 581,620 | 7,931,806 |
| 2064 | 7,931,806 | 1,537,607 | 2,195,730 | 23 | 570,651 | 7,844,311 |
| 2065 | 7,844,311 | 1,587,125 | 2,104,603 | 13 | 569,268 | 7,896,088 |
| 2066 | 7,896,088 | 1,638,446 | 2,012,726 | 7 | 578,424 | 8,100,225 |

# SINGLE DISCOUNT RATE DEVELOPMENT
## PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS) (CONCLUDED)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Total Contributions | Projected Benefit Payments | Projected Administrative Expenses | Projected Investment Earnings at 7.50% | Projected Ending Plan Net Position |
|---|---|---|---|---|---|---|
| | (a) | (b) | (c) | (d) | (e) | (f)=(a)+(b)-(c)-(d)+(e) |
| 2067 | $ 8,100,225 | $ 1,691,539 | $ 1,920,885 | $ 3 | $ 599,071 | $ 8,469,947 |
| 2068 | 8,469,947 | 1,746,430 | 1,829,380 | 1 | 632,191 | 9,019,187 |
| 2069 | 9,019,187 | 1,803,158 | 1,738,396 | - | 678,823 | 9,762,772 |
| 2070 | 9,762,772 | 1,861,752 | 1,648,195 | - | 740,071 | 10,716,400 |
| 2071 | 10,716,400 | 1,922,255 | 1,558,966 | - | 817,107 | 11,896,796 |
| 2072 | 11,896,796 | 1,984,727 | 1,470,775 | - | 911,184 | 13,321,932 |
| 2073 | 13,321,932 | 2,049,230 | 1,383,691 | - | 1,023,651 | 15,011,122 |
| 2074 | 15,011,122 | 2,115,830 | 1,297,798 | - | 1,155,956 | 16,985,110 |
| 2075 | 16,985,110 | 2,184,595 | 1,213,200 | - | 1,309,652 | 19,266,157 |
| 2076 | 19,266,157 | 2,255,594 | 1,130,026 | - | 1,486,407 | 21,878,132 |
| 2077 | 21,878,132 | 2,328,901 | 1,048,432 | - | 1,688,009 | 24,846,610 |
| 2078 | 24,846,610 | 2,404,590 | 968,596 | - | 1,916,372 | 28,198,976 |
| 2079 | 28,198,976 | 2,482,739 | 890,726 | - | 2,173,544 | 31,964,533 |
| 2080 | 31,964,533 | 2,563,428 | 815,053 | - | 2,461,719 | 36,174,627 |
| 2081 | 36,174,627 | 2,646,740 | 741,828 | - | 2,783,240 | 40,862,779 |
| 2082 | 40,862,779 | 2,732,759 | 671,309 | - | 3,140,615 | 46,064,844 |
| 2083 | 46,064,844 | 2,821,573 | 603,758 | - | 3,536,528 | 51,819,187 |
| 2084 | 51,819,187 | 2,913,274 | 539,427 | - | 3,973,849 | 58,166,883 |
| 2085 | 58,166,883 | 3,007,956 | 478,556 | - | 4,455,654 | 65,151,937 |
| 2086 | 65,151,937 | 3,105,714 | 421,356 | - | 4,985,239 | 72,821,534 |
| 2087 | 72,821,534 | 3,206,650 | 368,007 | - | 5,566,139 | 81,226,316 |
| 2088 | 81,226,316 | 3,310,866 | 318,646 | - | 6,202,153 | 90,420,689 |
| 2089 | 90,420,689 | 3,418,469 | 273,366 | - | 6,897,361 | 100,463,153 |
| 2090 | 100,463,153 | 3,529,570 | 232,216 | - | 7,656,152 | 111,416,659 |
| 2091 | 111,416,659 | 3,644,281 | 195,196 | - | 8,483,252 | 123,348,996 |
| 2092 | 123,348,996 | 3,762,720 | 162,255 | - | 9,383,751 | 136,333,212 |
| 2093 | 136,333,212 | 3,885,008 | 133,283 | - | 10,363,137 | 150,448,074 |
| 2094 | 150,448,074 | 4,011,271 | 108,119 | - | 11,427,327 | 165,778,553 |
| 2095 | 165,778,553 | 4,141,637 | 86,552 | - | 12,582,708 | 182,416,346 |
| 2096 | 182,416,346 | 4,276,240 | 68,326 | - | 13,836,170 | 200,460,430 |
| 2097 | 200,460,430 | 4,415,218 | 53,151 | - | 15,195,152 | 220,017,649 |
| 2098 | 220,017,649 | 4,558,713 | 40,715 | - | 16,667,685 | 241,203,332 |
| 2099 | 241,203,332 | 4,706,871 | 30,689 | - | 18,262,436 | 264,141,950 |
| 2100 | 264,141,950 | 4,859,844 | 22,752 | - | 19,988,758 | 288,967,800 |
| 2101 | 288,967,800 | 5,017,789 | 16,577 | - | 21,856,740 | 315,825,752 |
| 2102 | 315,825,752 | 5,180,867 | 11,863 | - | 23,877,265 | 344,872,021 |
| 2103 | 344,872,021 | 5,349,246 | 8,334 | - | 26,062,065 | 376,274,998 |
| 2104 | 376,274,998 | 5,523,096 | 5,746 | - | 28,423,785 | 410,216,133 |
| 2105 | 410,216,133 | 5,702,597 | 3,888 | - | 30,976,048 | 446,890,890 |
| 2106 | 446,890,890 | 5,887,931 | 2,582 | - | 33,733,527 | 486,509,766 |
| 2107 | 486,509,766 | 6,079,289 | 1,685 | - | 36,712,022 | 529,299,392 |
| 2108 | 529,299,392 | 6,276,866 | 1,081 | - | 39,928,541 | 575,503,718 |
| 2109 | 575,503,718 | 6,480,864 | 683 | - | 43,401,392 | 625,385,291 |
| 2110 | 625,385,291 | 6,691,492 | 427 | - | 47,150,275 | 679,226,631 |
| 2111 | 679,226,631 | 6,908,966 | 264 | - | 51,196,390 | 737,331,723 |
| 2112 | 737,331,723 | 7,133,507 | 162 | - | 55,562,543 | 800,027,611 |
| 2113 | 800,027,611 | 7,365,346 | 100 | - | 60,273,274 | 867,666,131 |
| 2114 | 867,666,131 | 7,604,720 | 63 | - | 65,354,979 | 940,625,767 |
| 2115 | 940,625,767 | 7,851,873 | 40 | - | 70,836,053 | 1,019,313,653 |
| 2116 | 1,019,313,653 | 8,107,059 | 32 | - | 76,747,041 | 1,104,167,721 |

# SINGLE DISCOUNT RATE DEVELOPMENT
# PRESENT VALUES OF PROJECTED BENEFIT PAYMENTS (DOLLARS IN THOUSANDS)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Benefit Payments | Funded Portion of Benefit Payments | Unfunded Portion of Benefit Payments | Present Value of Funded Benefit Payments using Expected Return Rate (v) | Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf) | Present Value of Benefit Payments using Single Discount Rate (sdr) |
|---|---|---|---|---|---|---|---|
| (a) | (b) | (c) | (d) | (e) | (f)=(d)*v^((a)-.5) | (g)=(e)*vf ^((a)-.5) | (h)=((c)/(1+sdr)^(a-.5) |
| 2017 | $ 17,994,909 | $ 1,469,270 | $ 1,469,270 | $ - | $ 1,417,090 | $ - | $ 1,417,090 |
| 2018 | 18,702,664 | 1,539,863 | 1,539,863 | - | 1,381,559 | - | 1,381,559 |
| 2019 | 19,374,504 | 1,612,279 | 1,612,279 | - | 1,345,610 | - | 1,345,610 |
| 2020 | 20,009,464 | 1,685,583 | 1,685,583 | - | 1,308,641 | - | 1,308,641 |
| 2021 | 20,607,766 | 1,759,593 | 1,759,593 | - | 1,270,791 | - | 1,270,791 |
| 2022 | 21,167,709 | 1,840,754 | 1,840,754 | - | 1,236,657 | - | 1,236,657 |
| 2023 | 21,680,494 | 1,922,597 | 1,922,597 | - | 1,201,526 | - | 1,201,526 |
| 2024 | 22,143,056 | 2,005,420 | 2,005,420 | - | 1,165,848 | - | 1,165,848 |
| 2025 | 22,551,820 | 2,084,168 | 2,084,168 | - | 1,127,096 | - | 1,127,096 |
| 2026 | 22,908,380 | 2,158,309 | 2,158,309 | - | 1,085,758 | - | 1,085,758 |
| 2027 | 23,214,861 | 2,229,990 | 2,229,990 | - | 1,043,552 | - | 1,043,552 |
| 2028 | 23,471,215 | 2,300,239 | 2,300,239 | - | 1,001,326 | - | 1,001,326 |
| 2029 | 23,676,233 | 2,366,031 | 2,366,031 | - | 958,108 | - | 958,108 |
| 2030 | 23,831,726 | 2,427,536 | 2,427,536 | - | 914,432 | - | 914,432 |
| 2031 | 23,939,468 | 2,486,113 | 2,486,113 | - | 871,160 | - | 871,160 |
| 2032 | 23,999,880 | 2,541,258 | 2,541,258 | - | 828,357 | - | 828,357 |
| 2033 | 23,975,461 | 2,593,959 | 2,593,959 | - | 786,545 | - | 786,545 |
| 2034 | 23,901,513 | 2,643,697 | 2,643,697 | - | 745,699 | - | 745,699 |
| 2035 | 23,778,206 | 2,690,758 | 2,690,758 | - | 706,022 | - | 706,022 |
| 2036 | 23,605,497 | 2,735,642 | 2,735,642 | - | 667,720 | - | 667,720 |
| 2037 | 23,382,816 | 2,777,782 | 2,777,782 | - | 630,703 | - | 630,703 |
| 2038 | 23,110,066 | 2,814,515 | 2,814,515 | - | 594,458 | - | 594,458 |
| 2039 | 22,789,956 | 2,845,732 | 2,845,732 | - | 559,118 | - | 559,118 |
| 2040 | 22,425,507 | 2,873,740 | 2,873,740 | - | 525,229 | - | 525,229 |
| 2041 | 22,017,520 | 2,898,302 | 2,898,302 | - | 492,761 | - | 492,761 |
| 2042 | 21,567,051 | 2,920,095 | 2,920,095 | - | 461,829 | - | 461,829 |
| 2043 | 21,074,576 | 2,938,156 | 2,938,156 | - | 432,265 | - | 432,265 |
| 2044 | 20,541,787 | 2,952,027 | 2,952,027 | - | 404,006 | - | 404,006 |
| 2045 | 19,971,091 | 2,961,526 | 2,961,526 | - | 377,029 | - | 377,029 |
| 2046 | 19,365,259 | 2,968,243 | 2,968,243 | - | 351,520 | - | 351,520 |
| 2047 | 18,725,616 | 2,971,527 | 2,971,527 | - | 327,357 | - | 327,357 |
| 2048 | 18,054,354 | 2,971,092 | 2,971,092 | - | 304,474 | - | 304,474 |
| 2049 | 17,354,215 | 2,966,771 | 2,966,771 | - | 282,819 | - | 282,819 |
| 2050 | 16,628,442 | 2,955,913 | 2,955,913 | - | 262,125 | - | 262,125 |
| 2051 | 15,883,391 | 2,940,557 | 2,940,557 | - | 242,570 | - | 242,570 |
| 2052 | 15,123,818 | 2,920,706 | 2,920,706 | - | 224,123 | - | 224,123 |
| 2053 | 14,354,908 | 2,895,480 | 2,895,480 | - | 206,686 | - | 206,686 |
| 2054 | 13,583,214 | 2,863,837 | 2,863,837 | - | 190,165 | - | 190,165 |
| 2055 | 12,816,967 | 2,825,527 | 2,825,527 | - | 174,531 | - | 174,531 |
| 2056 | 12,065,410 | 2,780,791 | 2,780,791 | - | 159,784 | - | 159,784 |
| 2057 | 11,338,186 | 2,729,880 | 2,729,880 | - | 145,915 | - | 145,915 |
| 2058 | 10,645,398 | 2,672,021 | 2,672,021 | - | 132,858 | - | 132,858 |
| 2059 | 9,998,772 | 2,606,649 | 2,606,649 | - | 120,565 | - | 120,565 |
| 2060 | 9,411,515 | 2,533,697 | 2,533,697 | - | 109,015 | - | 109,015 |
| 2061 | 8,897,867 | 2,454,612 | 2,454,612 | - | 98,244 | - | 98,244 |
| 2062 | 8,471,594 | 2,371,464 | 2,371,464 | - | 88,294 | - | 88,294 |
| 2063 | 8,145,310 | 2,285,001 | 2,285,001 | - | 79,139 | - | 79,139 |
| 2064 | 7,931,802 | 2,195,730 | 2,195,730 | - | 70,742 | - | 70,742 |
| 2065 | 7,844,307 | 2,104,603 | 2,104,603 | - | 63,075 | - | 63,075 |
| 2066 | 7,896,084 | 2,012,726 | 2,012,726 | - | 56,113 | - | 56,113 |

# SINGLE DISCOUNT RATE DEVELOPMENT
# PRESENT VALUES OF PROJECTED BENEFIT PAYMENTS (DOLLARS IN THOUSANDS)
# (CONCLUDED)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Benefit Payments | Funded Portion of Benefit Payments | Unfunded Portion of Benefit Payments | Present Value of Funded Benefit Payments using Expected Return Rate (v) | Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf) | Present Value of Benefit Payments using Single Discount Rate (sdr) |
|---|---|---|---|---|---|---|---|
| (a) | (b) | (c) | (d) | (e) | (f)=(d)*v^((a)-.5) | (g)=(e)*vf ^((a)-.5) | (h)=((c)/(1+sdr)^(a-.5) |
| 2067 | $ 8,100,221 | $ 1,920,885 | $ 1,920,885 | $ - | $ 49,817 | $ - | $ 49,817 |
| 2068 | 8,469,944 | 1,829,380 | 1,829,380 | - | 44,133 | - | 44,133 |
| 2069 | 9,019,184 | 1,738,396 | 1,738,396 | - | 39,013 | - | 39,013 |
| 2070 | 9,762,769 | 1,648,195 | 1,648,195 | - | 34,408 | - | 34,408 |
| 2071 | 10,716,397 | 1,558,966 | 1,558,966 | - | 30,274 | - | 30,274 |
| 2072 | 11,896,793 | 1,470,775 | 1,470,775 | - | 26,569 | - | 26,569 |
| 2073 | 13,321,930 | 1,383,691 | 1,383,691 | - | 23,252 | - | 23,252 |
| 2074 | 15,011,121 | 1,297,798 | 1,297,798 | - | 20,287 | - | 20,287 |
| 2075 | 16,985,108 | 1,213,200 | 1,213,200 | - | 17,642 | - | 17,642 |
| 2076 | 19,266,155 | 1,130,026 | 1,130,026 | - | 15,286 | - | 15,286 |
| 2077 | 21,878,130 | 1,048,432 | 1,048,432 | - | 13,193 | - | 13,193 |
| 2078 | 24,846,608 | 968,596 | 968,596 | - | 11,338 | - | 11,338 |
| 2079 | 28,198,973 | 890,726 | 890,726 | - | 9,699 | - | 9,699 |
| 2080 | 31,964,530 | 815,053 | 815,053 | - | 8,256 | - | 8,256 |
| 2081 | 36,174,624 | 741,828 | 741,828 | - | 6,990 | - | 6,990 |
| 2082 | 40,862,775 | 671,309 | 671,309 | - | 5,884 | - | 5,884 |
| 2083 | 46,064,840 | 603,758 | 603,758 | - | 4,923 | - | 4,923 |
| 2084 | 51,819,183 | 539,427 | 539,427 | - | 4,091 | - | 4,091 |
| 2085 | 58,166,878 | 478,556 | 478,556 | - | 3,376 | - | 3,376 |
| 2086 | 65,151,932 | 421,356 | 421,356 | - | 2,765 | - | 2,765 |
| 2087 | 72,821,530 | 368,007 | 368,007 | - | 2,247 | - | 2,247 |
| 2088 | 81,226,312 | 318,646 | 318,646 | - | 1,810 | - | 1,810 |
| 2089 | 90,420,686 | 273,366 | 273,366 | - | 1,444 | - | 1,444 |
| 2090 | 100,463,149 | 232,216 | 232,216 | - | 1,141 | - | 1,141 |
| 2091 | 111,416,655 | 195,196 | 195,196 | - | 892 | - | 892 |
| 2092 | 123,348,991 | 162,255 | 162,255 | - | 690 | - | 690 |
| 2093 | 136,333,207 | 133,283 | 133,283 | - | 527 | - | 527 |
| 2094 | 150,448,069 | 108,119 | 108,119 | - | 398 | - | 398 |
| 2095 | 165,778,548 | 86,552 | 86,552 | - | 296 | - | 296 |
| 2096 | 182,416,341 | 68,326 | 68,326 | - | 218 | - | 218 |
| 2097 | 200,460,425 | 53,151 | 53,151 | - | 157 | - | 157 |
| 2098 | 220,017,644 | 40,715 | 40,715 | - | 112 | - | 112 |
| 2099 | 241,203,328 | 30,689 | 30,689 | - | 79 | - | 79 |
| 2100 | 264,141,946 | 22,752 | 22,752 | - | 54 | - | 54 |
| 2101 | 288,967,796 | 16,577 | 16,577 | - | 37 | - | 37 |
| 2102 | 315,825,748 | 11,863 | 11,863 | - | 24 | - | 24 |
| 2103 | 344,872,018 | 8,334 | 8,334 | - | 16 | - | 16 |
| 2104 | 376,274,994 | 5,746 | 5,746 | - | 10 | - | 10 |
| 2105 | 410,216,129 | 3,888 | 3,888 | - | 6 | - | 6 |
| 2106 | 446,890,886 | 2,582 | 2,582 | - | 4 | - | 4 |
| 2107 | 486,509,762 | 1,685 | 1,685 | - | 2 | - | 2 |
| 2108 | 529,299,388 | 1,081 | 1,081 | - | 1 | - | 1 |
| 2109 | 575,503,714 | 683 | 683 | - | 1 | - | 1 |
| 2110 | 625,385,287 | 427 | 427 | - | - | - | - |
| 2111 | 679,226,628 | 264 | 264 | - | - | - | - |
| 2112 | 737,331,720 | 162 | 162 | - | - | - | - |
| 2113 | 800,027,608 | 100 | 100 | - | - | - | - |
| 2114 | 867,666,127 | 63 | 63 | - | - | - | - |
| 2115 | 940,625,763 | 40 | 40 | - | - | - | - |
| 2116 | 1,019,313,650 | 32 | 32 | - | - | - | - |
| | | | | **Totals** | $ 29,612,375 | $ - | $ 29,612,375 |

# SECTION H

## GLOSSARY OF TERMS

# GLOSSARY OF TERMS

| | |
|---|---|
| ***Actuarial Accrued Liability (AAL)*** | The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability." |
| ***Actuarial Assumptions*** | These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation. |
| ***Accrued Service*** | Service credited under the system which was rendered before the date of the actuarial valuation. |
| ***Actuarial Equivalent*** | A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions. |
| ***Actuarial Cost Method*** | A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method. |
| ***Actuarial Gain (Loss)*** | The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities. |
| ***Actuarial Present Value (APV)*** | The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment. |
| ***Actuarial Valuation*** | The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions. |
| ***Actuarial Valuation Date*** | The date as of which an actuarial valuation is performed. |
| ***Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)*** | A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment. |

# GLOSSARY OF TERMS

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|---|---|
| ***Amortization Payment*** | The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal. |
| ***Amortization Method*** | The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year). |
| ***Cost-of-Living Adjustments*** | Postemployment benefit changes intended to adjust benefit payments for the effects of inflation. |
| ***Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)*** | A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan. |
| ***Covered-Employee Payroll*** | The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap. |
| ***Deferred Inflows and Outflows*** | The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources. |
| ***Discount Rate*** | For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:<br>1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and<br>2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate. |

# GLOSSARY OF TERMS

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|---|---|
| ***Entry Age Actuarial Cost Method (EAN)*** | The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits. |
| ***GASB*** | The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities. |
| ***Fiduciary Net Position*** | The fiduciary net position is the value of the assets of the trust. |
| ***Long-Term Expected Rate of Return*** | The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio. |
| ***Money-Weighted Rate of Return*** | The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense. |
| ***Multiple-Employer Defined Benefit Pension Plan*** | A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer. |
| ***Municipal Bond Rate*** | The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted. |
| ***Net Pension Liability (NPL)*** | The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan. |
| ***Non-Employer Contribution Entities*** | Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statement plan members are not considered non-employer contribution entities. |
| ***Normal Cost*** | The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method. |

# GLOSSARY OF TERMS

***Other Postemployment Benefits (OPEB)*** All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.

***Real Rate of Return*** The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.

***Service Cost*** The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

***Total Pension Expense*** The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Benefit Changes
4. Employee Contributions (made negative for addition here)
5. Projected Earnings on Plan Investments (made negative for addition here)
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to Liabilities
9. Recognition of Outflow (Inflow) of Resources due to Assets

***Total Pension Liability (TPL)*** The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

***Unfunded Actuarial Accrued Liability (UAAL)*** The UAAL is the difference between actuarial accrued liability and valuation assets.

***Valuation Assets*** The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of the GASB Statement No. 67, the valuation asset is equal to the market value of assets.

Gabriel Roeder Smith & Company
Consultants & Actuaries

# PUBLIC EMPLOYEES RETIREMENT ASSOCIATION OF MINNESOTA
# LOCAL GOVERNMENT CORRECTIONAL SERVICE RETIREMENT PLAN

GASB STATEMENTS NO. 67 AND NO. 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2016

GRS
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December 2, 2016

Public Employees Retirement Association of Minnesota
Local Government Correctional Service Retirement Plan
St. Paul, Minnesota

Dear Trustees of the Local Government Correctional Service Retirement Plan:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the Local Government Correctional Service Retirement Plan ("LGCSRP"), as amended by Statement No. 82. These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust. GASB Statement No. 82 is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting statements.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. PERA is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer. This report may be provided to parties other than the Public Employees Retirement Association (PERA) only in its entirety and only with the permission of PERA. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by PERA, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not audited.

This report complements the actuarial valuation report for funding purposes that was or will be provided to the System and should be considered in conjunction with that report. Please see the actuarial valuation report as of June 30, 2016 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the Local Government Correctional Service Retirement Plan as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

The signing actuaries are independent of the plan sponsor.

Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

By Brian B. Murphy
Brian B. Murphy
FSA, EA, FCA, MAAA

By Bonita J. Wurst
Bonita J. Wurst
ASA, EA, FCA, MAAA

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# SECTION A

## EXECUTIVE SUMMARY

# EXECUTIVE SUMMARY
## AS OF JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | 2016 |
|---|---|---|
| Actuarial Valuation Date | | June 30, 2016 |
| Measurement Date of the Net Pension Liability | | June 30, 2016 |
| Employer's Fiscal Year Ending Date (Reporting Date) | | Varies by Employer |
| **Membership** | | |
| Number of | | |
| - Service Retirements | | 749 |
| - Survivors | | 49 |
| - Disability Retirements | | 169 |
| - Deferred Retirements | | 2,755 |
| - Terminated other non-vested | | 2,359 |
| - Active Members | | 3,827 |
| - Total | | 9,908 |
| Covered Payroll | $ | 188,816 |
| **Net Pension Liability** | | |
| Total Pension Liability | $ | 873,097 |
| Plan Fiduciary Net Position | | 507,783 |
| Net Pension Liability | $ | 365,314 |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability | | 58.16% |
| Net Pension Liability as a Percentage of Covered Payroll | | 193.48% |
| **Development of the Single Discount Rate** | | |
| Single Discount Rate | | 5.31% |
| Long-Term Expected Rate of Investment Return | | 7.50% |
| Long-Term Municipal Bond Rate* | | 2.85% |
| Last year ending June 30 in the 2017 to 2116 projection period for which projected benefit payments are fully funded | | 2058 |
| **Total Pension Expense/ (Income)** | **$** | **85,344** |

**Deferred Outflows and Inflows by Source Arising from Current and Prior Periods to be Recognized in Future Pension Expenses**

| | Deferred Outflows of Resources | Deferred Inflows of Resources |
|---|---|---|
| Difference between expected and actual experience | $ 286 | $ 5,277 |
| Changes in assumptions | 232,749 | 8,542 |
| Net difference between projected and actual earnings on pension plan investments | 41,044 | 15,921 |
| Total | $ 274,079 | $ 29,740 |

** Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 30, 2016*

# DISCUSSION

**Accounting Standard**

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans* establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions* establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements. Governmental Accounting Standards Board (GASB) Statement No. 82, Pension Issues, is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

**Financial Statements**

GASB Statement No. 68 requires state and local governmental employers to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to LGCSRP subsequent to the measurement date of June 30, 2016.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a Statement of Fiduciary Net Position and a Statement of Changes in Fiduciary Net Position in accordance with GASB Statement No. 67. The *Statement of Fiduciary Net Position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *Statement of Changes in Fiduciary Net Position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

**Notes to Financial Statements**

GASB Statement No. 68 requires the notes to the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

Both GASB Statements No. 67 and No. 68 require the notes to the financial statements for the employers and pension plans to include certain descriptive information about the pension plans through which the pension benefits are provided. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the classes of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than the current discount rate used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with Statement No. 67. This information includes:

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

**Required Supplementary Information**

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

**Measurement of the Net Pension Liability**

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

**General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status**

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.50% on the actuarial value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain approximately level as a percentage of payroll.
2. The unfunded actuarial accrued liabilities will increase and not be eliminated.
3. The funded status of the plan will decrease.
4. The plan may eventually become insolvent and unable to pay benefits.

The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

**Limitations of Funded Status Measurements**

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 regard 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 other words of transferring the obligations to an unrelated third party in an arm's length market value type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, 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.

## Limitation of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

## Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2016 and a measurement date of June 30, 2016.

## Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a single discount rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 2.85% (based on the weekly rate closest to but not later than the measurement date of the Bond Buyer 20-Year GO Index); and the resulting single discount rate is 5.31%. The long-term expected rate of return is based on a review of inflation and investment assumptions, dated September 11, 2014, and a recent asset liability study obtained by the Minnesota State Board of Investment.

## Effective Date and Transition

GASB Statements No. 67 and No. 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB.

# SECTION B

## FINANCIAL STATEMENTS

# PENSION EXPENSE UNDER GASB STATEMENT NO. 68
# FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

**A. Expense**

| | | | |
|---|---|---|---|
| 1. | Service Cost | $ | 25,950 |
| 2. | Interest on the Total Pension Liability | | 40,605 |
| 3. | Current-Period Benefit Changes | | 0 |
| 4. | Employee Contributions (made negative for addition here) | | (11,008) |
| 5. | Projected Earnings on Plan Investments (made negative for addition here) | | (39,433) |
| 6. | Pension Plan Administrative Expense | | 290 |
| 7. | Other Changes in Plan Fiduciary Net Position | | 2 |
| 8. | Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability | | |
| | *Arising from Current Reporting Period* | | 96 |
| 9. | Recognition of Outflow (Inflow) of Resources due to assumption changes | | |
| | *Arising from Current Reporting Period* | | 77,583 |
| 10. | Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments | | |
| | *Arising from Current Reporting Period* | | 7,845 |
| 11. | **Increase/(Decrease) from Experience in the Current Reporting Period** | **$** | **101,930** |
| 12. | Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability | | |
| | *Arising from Prior Reporting Periods* | | (3,305) |
| 13. | Recognition of Outflow (Inflow) of Resources due to assumption changes | | |
| | *Arising from Prior Reporting Periods* | | (8,542) |
| 14. | Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments | | |
| | *Arising from Prior Reporting Periods* | | (4,739) |
| 15. | **Total Pension Expense / (Income)** | **$** | **85,344** |

# STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | |
|---|---|---|
| **A. Outflows (Inflows) of Resources due to Liabilities** | | |
| 1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses | $ | 382 |
| 2. Assumption Changes (gains) or losses | | 310,332 |
| 3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years} | | 4.0000 |
| 4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability | $ | 96 |
| 5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes | | 77,583 |
| 6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities | $ | 77,679 |
| 7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability | $ | 286 |
| 8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes | | 232,749 |
| 9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities | $ | 233,035 |
| **B. Outflows (Inflows) of Resources due to Assets** | | |
| 1. Net difference between projected and actual earnings on pension plan investments (gains) or losses | $ | 39,224 |
| 2. Recognition period for Assets {in years} | | 5.0000 |
| 3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets | $ | 7,845 |
| 4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets | $ | 31,379 |

# STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT AND PRIOR REPORTING PERIODS FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

**A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense**

| | Outflows of Resources | Inflows of Resources | Net Outflows of Resources |
|---|---|---|---|
| 1. Due to Liabilities | $ 77,679 | $ 11,847 | $ 65,832 |
| 2. Due to Assets | 11,067 | 7,961 | 3,106 |
| **3. Total** | $ 88,746 | $ 19,808 | $ 68,938 |

**B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense**

| | Outflows of Resources | Inflows of Resources | Net Outflows of Resources |
|---|---|---|---|
| 1. Differences between expected and actual experience | $ 96 | $ 3,305 | $ (3,209) |
| 2. Assumption Changes | 77,583 | 8,542 | 69,041 |
| 3. Net Difference between projected and actual earnings on pension plan investments | 11,067 | 7,961 | 3,106 |
| **4. Total** | $ 88,746 | $ 19,808 | $ 68,938 |

**C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses**

| | Deferred Outflows of Resources | Deferred Inflows of Resources | Net Deferred Outflows of Resources |
|---|---|---|---|
| 1. Differences between expected and actual experience | $ 286 | $ 5,277 | $ (4,991) |
| 2. Assumption Changes | 232,749 | 8,542 | 224,207 |
| 3. Net Difference between projected and actual earnings on pension plan investments | 41,044 | 15,921 | 25,123 |
| **4. Total** | $ 274,079 | $ 29,740 | $ 244,339 |

**D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses**

| Year Ending June 30 | Net Deferred Outflows of Resources |
|---|---|
| 2017 | $ 68,938 |
| 2018 | 78,814 |
| 2019 | 88,745 |
| 2020 | 7,842 |
| 2021 | 0 |
| Thereafter | 0 |
| **Total** | $ 244,339 |

## STATEMENT OF FIDUCIARY NET POSITION
## (DOLLARS IN THOUSANDS)

| | Market Value | |
|---|---|---|
| **Assets in Trust** | **June 30, 2016** | **June 30, 2015** |
| Cash, equivalents, short term securities | $ 11,243 | $ 9,901 |
| Fixed income | 125,331 | 115,387 |
| Equity | 306,438 | 304,773 |
| SBI Alternative | 64,984 | 60,509 |
| Other | 0 | 0 |
| **Total Assets in Trust** | **$ 507,996** | **$ 490,570** |
| | | |
| Assets Receivable | 234 | 420 |
| Amounts Payable | (447) | (259) |
| **Net Position Restricted for Pensions** | **$ 507,783** | **$ 490,731** |

# STATEMENT OF CHANGES IN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS)

| **Change in Assets** | **Market Value** | |
|---|---|---|
| **Year Ending** | **June 30, 2016** | **June 30, 2015** |
| 1. Fund balance at market value at beginning of year | $ 490,731 | $ 453,232 |
| 2. Adjustment to match beginning of year asset statement | 0 | (1) |
| 3. Fund balance at market value at beginning of year | 490,731 | 453,231 |
| 4. Contributions | | |
| a. Member | 11,008 | 10,472 |
| b. Employer | 16,490 | 15,736 |
| c. Other sources | 0 | 0 |
| d. Total contributions | 27,498 | 26,208 |
| 5. Investment income | | |
| a. Investment income/(loss) | 870 | 21,039 |
| b. Investment expenses | (661) | (666) |
| c. Net subtotal | 209 | 20,373 |
| 6. Other | (2) | 0 |
| **7. Total additions:** *(4.d.) + (5.c.) + (6.)* | **$ 27,705** | **$ 46,581** |
| 8. Benefits Paid | | |
| a. Annuity benefits | (9,381) | (7,777) |
| b. Refunds | (982) | (1,057) |
| c. Total benefits paid | (10,363) | (8,834) |
| 9. Expenses | | |
| a. Other | 0 | 0 |
| b. Administrative | (290) | (247) |
| c. Total expenses | (290) | (247) |
| **10. Total deductions:** *(8.c.) + (9.c.)* | **(10,653)** | **(9,081)** |
| 11. Net increase (decrease) in net position: *(7.) + (10.)* | 17,052 | 37,500 |
| **12. Net position restricted for pensions** | **$ 507,783** | **$ 490,731** |
| 13. Approximate return on market value of assets | 0.0% | 4.4% |

# SECTION C

## REQUIRED SUPPLEMENTARY INFORMATION

# SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS CURRENT PERIOD

## FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | |
|---|---|---|
| **A. Total pension liability** | | |
| 1. Service Cost | $ | 25,950 |
| 2. Interest on the Total Pension Liability | | 40,605 |
| 3. Changes of benefit terms | | 0 |
| 4. Difference between expected and actual experience of the Total Pension Liability | | 382 |
| 5. Changes of assumptions | | 310,332 |
| 6. Benefit payments, including refunds of employee contributions | | (10,363) |
| 7. Net change in total pension liability | $ | 366,906 |
| 8. Total pension liability – beginning | | 506,191 |
| 9. Total pension liability – ending | **$** | **873,097** |
| **B. Plan fiduciary net position** | | |
| 1. Contributions – employer | $ | 16,490 |
| 2. Contributions – employee | | 11,008 |
| 3. Net investment income | | 209 |
| 4. Benefit payments, including refunds of employee contributions | | (10,363) |
| 5. Pension Plan Administrative Expense | | (290) |
| 6. Other | | (2) |
| 7. Net change in plan fiduciary net position | $ | 17,052 |
| 8. Plan fiduciary net position – beginning | | 490,731 |
| 9. Plan fiduciary net position – ending | **$** | **507,783** |
| **C. Net pension liability** | **$** | **365,314** |
| **D. Plan fiduciary net position as a percentage of the total pension liability** | | **58.16%** |
| **E. Covered-employee payroll** | **$** | **188,816** |
| **F. Net pension liability as a percentage of covered employee payroll** | | **193.48%** |

# SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION

## SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS MULTIYEAR (DOLLARS IN THOUSANDS)

### Last 10 Fiscal Years (which may be built prospectively)

| Fiscal year ending June 30, | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Pension Liability** | | | | | | | | | | |
| Service Cost | $ 25,950 | $ 25,098 | $ 26,488 | | | | | | | |
| Interest on the Total Pension Liability | 40,605 | 37,043 | 33,955 | | | | | | | |
| Benefit Changes | 0 | 0 | 0 | | | | | | | |
| Difference between Expected and Actual Experience | 382 | (7,892) | (5,327) | | | | | | | |
| Assumption Changes | 310,332 | 0 | (34,168) | | | | | | | |
| Benefit Payments | (9,381) | (7,777) | (6,711) | | | | | | | |
| Refunds | (982) | (1,057) | (1,105) | | | | | | | |
| **Net Change in Total Pension Liability** | 366,906 | 45,415 | 13,132 | | | | | | | |
| **Total Pension Liability - Beginning** | 506,191 | 460,776 | 447,644 | | | | | | | |
| **Total Pension Liability - Ending (a)** | $ 873,097 | $ 506,191 | $ 460,776 | | | | | | | |
| **Plan Fiduciary Net Position** | | | | | | | | | | |
| Employer Contributions | $ 16,490 | $ 15,736 | $ 15,054 | | | | | | | |
| Employee Contributions | 11,008 | 10,472 | 10,030 | | | | | | | |
| Pension Plan Net Investment Income | 209 | 20,373 | 69,451 | | | | | | | |
| Benefit Payments | (9,381) | (7,777) | (6,711) | | | | | | | |
| Refunds | (982) | (1,057) | (1,105) | | | | | | | |
| Pension Plan Administrative Expense | (290) | (247) | (236) | | | | | | | |
| Other | (2) | (1) | (1) | | | | | | | |
| **Net Change in Plan Fiduciary Net Position** | 17,052 | 37,499 | 86,482 | | | | | | | |
| **Plan Fiduciary Net Position - Beginning** | 490,731 | 453,232 | 366,750 | | | | | | | |
| **Plan Fiduciary Net Position - Ending (b)** | $ 507,783 | $ 490,731 | $ 453,232 | | | | | | | |
| **Net Pension Liability - Ending (a) - (b)** | 365,314 | 15,460 | 7,544 | | | | | | | |
| **Plan Fiduciary Net Position as a Percentage of Total Pension Liability** | 58.16 % | 96.95 % | 98.36 % | | | | | | | |
| **Covered Employee Payroll** | $ 188,816 | $ 179,623 | $ 172,041 | | | | | | | |
| **Net Pension Liability as a Percentage of Covered Employee Payroll** | 193.48 % | 8.61 % | 4.39 % | | | | | | | |

**Notes to Schedule:**

N/A

## SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
## SCHEDULE OF NET PENSION LIABILITY MULTIYEAR
## (DOLLARS IN THOUSANDS)
## Last 10 Fiscal Years (which may be built prospectively)

| FY Ending June 30, | Total Pension Liability | Plan Net Position | Net Pension Liability | Plan Net Position as a % of Total Pension Liability | Covered Payroll | Net Pension Liability as a % of Covered Payroll |
|---|---|---|---|---|---|---|
| 2007 | | | | | | |
| 2008 | | | | | | |
| 2009 | | | | | | |
| 2010 | | | | | | |
| 2011 | | | | | | |
| 2012 | | | | | | |
| 2013 | | | | | | |
| 2014 | $ 460,776 | $ 453,232 | $ 7,544 | 98.36% | $ 172,041 | 4.39% |
| 2015 | 506,191 | 490,731 | 15,460 | 96.95% | 179,623 | 8.61% |
| 2016 | 873,097 | 507,783 | 365,314 | 58.16% | 188,816 | 193.48% |

## SCHEDULE OF CONTRIBUTIONS MULTIYEAR *(DOLLARS IN THOUSANDS)*

## Last 10 Fiscal Years

| FY Ending June 30, | Actuarially Determined Contribution | Actual Contribution | Contribution Deficiency (Excess) | Covered Payroll | Actual Contribution as a % of Covered Payroll |
|---|---|---|---|---|---|
| 2007 | $ 8,712 | $ 12,499 | $ (3,787) | $ 134,117 | 9.32% |
| 2008 | 10,153 | 13,388 | (3,235) | 154,202 | 8.68 |
| 2009 | 11,469 | 14,124 | (2,655) | 154,650 | 9.13 |
| 2010 | 12,273 | 14,170 | (1,897) | 154,777 | 9.16 |
| 2011 | 12,183 | 14,289 | (2,106) | 165,077 | 8.66 |
| 2012 | 12,473 | 14,320 | (1,847) | 164,340 | 8.71 |
| 2013 | 14,207 | 14,498 | (291) | 164,820 | 8.80 |
| 2014 | 14,606 | 15,054 | (448) | 172,041 | 8.75 |
| 2015 | 13,759 | 15,736 | (1,977) | 179,623 | 8.76 |
| 2016 | 16,446 | 16,490 | (44) | 188,816 | 8.73 |

## NOTES TO SCHEDULE OF CONTRIBUTIONS

| | |
|---|---|
| **Valuation Date:** | June 30, 2016 |
| Notes | Actuarially determined contribution rates are calculated as of each June 30 and apply to the fiscal year beginning on the day after the measurement date. |

**Methods and Assumptions Used to Determine Contribution Rates:**

| | |
|---|---|
| Actuarial Cost Method | Entry Age Normal |
| Amortization Method | Level Percentage of Payroll, Closed |
| Remaining Amortization Period | 15 years |
| Asset Valuation Method | 5-Year smoothed market; no corridor |
| Inflation | 2.75% |
| Payroll Growth | 3.50% |
| Salary Increases | 3.75% to 8.75% including inflation |
| Investment Rate of Return | 8.00% |
| Retirement Age | Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2012 valuation pursuant to an experience study of the period 2006 - 2011, prepared by a former actuary. |
| Mortality | RP-2000 annuitant generational mortality table, projected with scale AA, white collar adjustment. |

**Other Information:**

| | |
|---|---|
| Notes | The plan is assumed to pay a 2.50% post-retirement benefit increase for all years.<br>See separate funding report as of July 1, 2016 for additional detail. |

## SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

## Last 10 Fiscal Years

| FY Ending June 30, | Annual Return[1] |
|---|---|
| 2007 | |
| 2008 | |
| 2009 | |
| 2010 | |
| 2011 | |
| 2012 | |
| 2013 | |
| 2014 | |
| 2015 | |
| 2016 | |

[1] *Annual money-weighted rate of return, net of investment expenses.*

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

# SECTION D

## ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

## ASSET ALLOCATION

| Asset Class | Target Allocation | Long-Term Expected Real Rate of Return |
|---|---|---|
| Domestic Fixed Income | | |
| International Fixed Income | | |
| Domestic Equity | | |
| International Equity | | |
| Private Equity | | |
| Real Estate | | |
| Commodities | | |
| Cash | | |
| **Total** | | |

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

## Single Discount Rate

A single discount rate of 5.31% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 7.50% and the municipal bond rate of 2.85%. The projection of cash flows used to determine this single discount rate assumed that plan member and employer contributions will be made at the current statutory contribution rates. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance the benefit payments through the year ending June 30, 2058. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year ending June 30, 2058, and the municipal bond rate was applied to all benefit payments after the point of asset depletion.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 5.31%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher:

### Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

*(Dollars in Thousands)*

| | 1% Decrease 4.31% | Current Single Discount Rate Assumption 5.31% | 1% Increase 6.31% |
|---|---|---|---|
| Total Pension Liability | $ 1,057,833 | $ 873,097 | $ 728,875 |
| Net Position Restricted for Pensions | 507,783 | 507,783 | 507,783 |
| Net Pension Liability | **$ 550,050** | **$ 365,314** | **$ 221,092** |

# GASB Statement No. 68 Reconciliation (Dollars in Thousands)
## Current Reporting Period

| | Total Pension Liability (a) | Plan Fiduciary Net Position (b) | Net Pension Liability (a) - (b) | Current Period: Deferred Outflows | Current Period: Deferred Inflows | Current Period: Pension Expense* |
|---|---|---|---|---|---|---|
| **Balance Beginning of Year** | **$ 506,191** | **$ 490,731** | **$ 15,460** | | | |
| **Changes for the Year:** | | | | | | |
| Service Cost | $ 25,950 | | $ 25,950 | | | $ 25,950 |
| Interest on Total Pension Liability | 40,605 | | 40,605 | | | 40,605 |
| Interest on Fiduciary Net Position | | $ 39,433 | (39,433) | | | (39,433) |
| Changes in Benefit Terms | | | | | | |
| Liability Experience Gains and Losses | 382 | | 382 | $ 286 | $ - | 96 |
| Changes in Assumptions | 310,332 | | 310,332 | 232,749 | - | 77,583 |
| Contributions - Employer | | 16,490 | (16,490) | | | |
| Contributions - Employees | | 11,008 | (11,008) | | | (11,008) |
| Asset Gain/(Loss) | | (39,224) | 39,224 | 31,379 | - | 7,845 |
| Benefit Payouts | (10,363) | (10,363) | | | | |
| Administrative Expenses | | (290) | 290 | | | 290 |
| Other | | (2) | 2 | | | 2 |
| **Net Changes** | **$ 366,906** | **$ 17,052** | **$ 349,854** | **$ 264,414** | **$ -** | **$ 101,930** |
| **Balance End of Year** | **$ 873,097** | **$ 507,783** | **$ 365,314** | | | |

** Pension Expense from Experience in the Current Reporting Period.*

## GASB STATEMENT NO. 68 RECONCILIATION (DOLLARS IN THOUSANDS)
## CURRENT AND PRIOR REPORTING PERIODS

| | Total Pension Liability (a) | Plan Fiduciary Net Position (b) | Net Pension Liability (a) - (b) | Deferred Outflows | Deferred Inflows | Net Deferred Outflows Prior Year | Total Pension Expense* |
|---|---|---|---|---|---|---|---|
| **Balance Beginning of Year** | **$ 506,191** | **$ 490,731** | **$ 15,460** | | | | |
| **Changes for the Year:** | | | | | | | |
| Service Cost | $ 25,950 | | $ 25,950 | | | | $ 25,950 |
| Interest on Total Pension Liability | 40,605 | | 40,605 | | | | 40,605 |
| Interest on Fiduciary Net Position | | $ 39,433 | (39,433) | | | | (39,433) |
| Changes in Benefit Terms | | | | | | | |
| Liability Experience Gains and Losses | 382 | | 382 | $ 286 | $ 5,277 | $ (8,582) | (3,209) |
| Changes in Assumptions | 310,332 | | 310,332 | 232,749 | 8,542 | (17,084) | 69,041 |
| Contributions - Employer | | 16,490 | (16,490) | | | | |
| Contributions - Employees | | 11,008 | (11,008) | | | | (11,008) |
| Asset Gain/(Loss) | | (39,224) | 39,224 | 41,044 | 15,921 | (10,995) | 3,106 |
| Benefit Payouts | (10,363) | (10,363) | | | | | |
| Administrative Expenses | | (290) | 290 | | | | 290 |
| Other | | (2) | 2 | | | | 2 |
| **Net Changes** | **$ 366,906** | **$ 17,052** | **$ 349,854** | | | | **$ 85,344** |
| **Balance End of Year** | **$ 873,097** | **$ 507,783** | **$ 365,314** | **$ 274,079** | **$ 29,740** | **$ (36,661)** | |

** Pension Expense from Experience in the Current and Prior Reporting Periods.*

## SUMMARY OF POPULATION STATISTICS

| | | Terminated | | Recipients | | | |
|---|---|---|---|---|---|---|---|
| | Actives | Deferred Retirement | Other Non-Vested | Service Retirement | Disability Retirement | Survivor | Total |
| **Members on 7/1/2015** | **3,692** | **2,620** | **2,139** | **655** | **169** | **40** | **9,315** |
| New members | 629 | 0 | 0 | 0 | 0 | 0 | **629** |
| Return to active | 38 | (21) | (17) | 0 | 0 | 0 | **0** |
| Terminated non-vested | (276) | 0 | 276 | 0 | 0 | 0 | **0** |
| Service retirements | (66) | (33) | 0 | 99 | 0 | 0 | **0** |
| Terminated deferred | (136) | 136 | 0 | 0 | 0 | 0 | **0** |
| Terminated refund/transfer | (47) | (30) | (40) | 0 | 0 | 0 | **(117)** |
| Deaths | (4) | (4) | (5) | (5) | (5) | 0 | **(23)** |
| New beneficiary | 0 | 0 | 0 | 0 | 0 | 10 | **10** |
| Disabled | (3) | 0 | 0 | 0 | 3 | 0 | **0** |
| Data correction | 0 | 87 | 6 | 0 | 2 | (1) | **94** |
| Net change | 135 | 135 | 220 | 94 | 0 | 9 | **593** |
| **Members on 6/30/2016** | **3,827** | **2,755** | **2,359** | **749** | **169** | **49** | **9,908** |

# SECTION E

## SUMMARY OF BENEFITS

## SUMMARY OF PLAN PROVISIONS

Following is a summary of the major plan provisions used in the valuation of this report. PERA is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

| | |
|---|---|
| **Plan year** | July 1 through June 30 |
| **Eligibility** | Local government employees in covered correctional service for a county administered jail or correctional facility or in a regional correctional facility administered by multiple counties, who are directly responsible for security, custody and control of persons confined in jail or facility, who are expected to respond to incidents within the jail or facility, and who are not members of the Public Employees Police and Fire Fund. |
| **Contributions** | Shown as a percent of salary:<br><br><u>Member</u> 5.83%<br><u>Employer</u> 8.75%<br><br>Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h). |
| **Allowable service** | Local Government Correctional Service during which member contributions were made (effective July 1, 1999). May also include certain leaves of absence, military service and periods while temporary Worker's Compensation is paid. |
| **Salary** | Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leaves and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage. |
| **Average salary** | Average of the five highest successive years of salary. Average Salary is based on all Allowable Service if less than five years. |
| **Vesting** | Hired before July 1, 2010: 100% vested after 3 years of Allowable Service.<br>Hired after June 30, 2010: 50% vested after 5 years of Allowable Service;<br>60% vested after 6 years of Allowable Service;<br>70% vested after 7 years of Allowable Service;<br>80% vested after 8 years of Allowable Service;<br>90% vested after 9 years of Allowable Service;<br>100% vested after 10 years of Allowable Service. |
| **Retirement** | |
| <u>Normal retirement benefit</u> | |
| Age/service requirement | Age 55 and vested. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service. |
| Amount | 1.90% of Average Salary for each year of Allowable Service, pro rata for completed months. |

## SUMMARY OF PLAN PROVISIONS (CONTINUED)

**Retirement (Continued)**

| | |
|---|---|
| <u>Early Retirement</u> | |
| Age/service requirement | Age 50 and vested. |
| Amount | Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with actuarial reduction to commencement age assuming 3% augmentation to age 55 (2.50% if hired after June 30, 2006). |
| <u>Form of payment</u> | Life annuity. Actuarially equivalent options are:<br><br>25%, 50%, 75% or 100% Joint and Survivor. If a Joint and Survivor benefit is elected and the beneficiary predeceases the annuitant, the annuitant's benefit increases to the Life Annuity amount. This "bounce back" is subsidized by the plan. |
| <u>Benefit increases</u> | Benefit recipients received a post-retirement benefit increase of 1.0% on January 1, 2013 and January 1, 2014. Because the actuarial accrued liability funding ratio (on a market value of assets basis) reached 90% for two consecutive years, the benefit increase reverted to 2.5% on January 1, 2015. If the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.0%.<br><br>A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. |

**Disability**

| | |
|---|---|
| <u>Duty Disability</u> | |
| Age/service requirement | Member who cannot perform his duties as a direct result of a disability relating to an act of duty specific to protecting the property and personal safety of others. |
| Amount | 47.50% of Average Salary plus 1.90% of Average Salary for each year in excess of 25 years of Allowable Service (pro rata for completed months).<br><br>Payment begins at disability and ends at age 65 or earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability. |
| <u>Regular Disability</u> | |
| Age/service requirement | At least one year of Allowable Service and a disability preventing member from performing normal duties that arise out of activities not related to covered employment or while at work, activities related to duties that do not present inherent dangers specific to occupation. |

## SUMMARY OF PLAN PROVISIONS (CONTINUED)

| | |
|---|---|
| **Disability** (Continued) | |
| Amount | Normal Retirement Benefit based on Allowable Service (minimum of 10 years) and Average Salary at disability.<br><br>Payment begins at disability and ends at age 65 or earlier if disability ceases or death occurs. Benefits may be paid upon re-employment but salary plus benefit cannot exceed current salary of position held at time of disability. |
| Retirement benefit | |
| Age/service requirement | Age 65 with continued disability. |
| Amount | Any optional annuity continues. Otherwise, the larger of the disability benefit paid before age 65 or the normal retirement benefit available at age 65, or an actuarially equivalent optional annuity. |
| Form of payment | Same as for retirement. |
| Benefit increases | Same as for retirement. |
| **Death** | |
| Surviving spouse benefit | |
| Age/service requirement | Vested active member at any age or vested former member age 50 or older who dies before retirement or disability benefit commences. If an active member dies, benefits may commence immediately, regardless of age. |
| Amount | Surviving spouse receives the 100% joint and survivor benefit using the Normal Retirement formula above. If commencement is prior to age 55, the appropriate early retirement formula described above applies except that one-half the monthly reduction factor is used from age 50 to the commencement age. In lieu of this benefit, the surviving spouse may elect a refund of contributions with interest or an actuarially equivalent term certain annuity (lump sum payable to estate at death). |
| Benefit increases | Same as for retirement. |
| Surviving dependent children's benefit | |
| Age/service requirement | If no surviving spouse, all dependent children (biological or adopted) below age 20 who are dependent for more than half of their support on deceased member. |
| Amount | Actuarially equivalent to surviving spouse 100% joint and survivor annuity payable to the later of age 20 or five years. The amount is to be proportionally divided among surviving children. |
| Refund of contributions | |
| Age/service requirement | Active employee dies and survivor benefits paid are less than member's contributions or a former employee dies before annuity begins. |

## SUMMARY OF PLAN PROVISIONS (CONTINUED)

| | |
|---|---|
| **Death** (Continued) | |
| Amount | If no survivor benefits are paid, the member's contributions with 6.00% interest until June 30, 2011; 4.00% interest thereafter. If survivor benefits are paid and accumulated contributions exceed total payments to the surviving spouse and children, then the remaining contributions are paid out. |
| **Termination** | |
| Refund of contributions | |
| Age/service requirement | Termination of local government service. |
| Amount | If member terminated before July 1, 2011, member's contributions with 6.00% interest compounded annually until June 30, 2011; 4.00% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4% interest compounded annually. |
| Deferred benefit | |
| Age/service requirement | A deferred annuity may be elected in lieu of a refund if vested.<br><br>Partially or fully vested. |
| Amount | Benefit computed under law in effect at termination and increased by the following percentage (augmentation), compounded annually, if termination of employment is prior to January 1, 2012:<br><br>(a.) 3.00% (2.50% if hired after June 30, 2006) until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012;<br>(b.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; and<br>(c.) 1.00% from January 1, 2012 thereafter.<br><br>If a member terminates employment after 2011, they are not eligible for augmentation. |
| Form of payment | Same as for retirement. |
| **Optional form conversion factors** | Actuarially equivalent factors based on the RP-2000 mortality table for healthy annuitants, white collar adjustment, projected to 2026 using scale AA, no setbacks, blended 65% males and 6.0% interest. The interest rate assumption will change to 6.5% on the earlier of the effective date of the next mortality adjustment or July 1, 2017. |

## SUMMARY OF PLAN PROVISIONS (CONCLUDED)

| | |
|---|---|
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br><br>(a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan;<br>or<br>(b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010).<br><br>Other requirements for combined service include:<br><br>(a.) Member must have at least six months of allowable service credit in each plan worked under; and<br>(b.) Member may not be in receipt of a benefit from another plan.<br><br>Members who meet the above requirements must have their benefit based on the following:<br><br>(a.) Allowable service in all covered plans are combined in order to determine eligibility for early retirement.<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |
| **Changes in plan provisions** | There have been no changes to plan provisions since previous valuation |

# SECTION F

## ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

# ACTUARIAL METHODS USED FOR THE DETERMINATION OF TOTAL PENSION LIABILITY AND RELATED VALUES

**Actuarial Cost Method**

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were 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 Total Pension Liability.

**Valuation of Future Post-Retirement Benefit Increases**

Benefit recipients receive a future annual 2.50% post-retirement benefit increase. If the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.

Based on the assumptions and methods in this report, this plan is expected to pay the 2.50% benefit increases indefinitely.

**Asset Valuation Method**

Fair value of assets.

## SUMMARY OF ACTUARIAL ASSUMPTIONS USED FOR THE DETERMINATION OF TOTAL PENSION LIABILITY AND RELATED VALUES

The following assumptions were used in valuing the liabilities and benefits under the Plan. The assumptions are based on the last experience study, dated February 2012, prepared by a former actuary, a review of inflation and investment return assumptions, dated September 11, 2014, and a recent asset liability study obtained by the SBI.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment. We note that the LCPR has recently completed a review of this assumption. This review recommended changes to this assumption, expected to be effective at a future date.

| | |
|---|---|
| Investment return | 7.50% per annum. |
| Single discount rate | 5.31% per annum. |
| Benefit increases after retirement | 2.50% per annum. |
| Salary increases | Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service earned during the year. |
| Inflation | 2.50% per year. |
| Payroll growth | 3.25% per year. |
| Mortality rates | |
| Healthy Pre-retirement | RP-2000 employee generational mortality table projected with mortality improvement scale AA, white collar adjustment. |
| Healthy Post-retirement | RP-2000 annuitant generational mortality table projected with mortality improvement scale AA, white collar adjustment.<br><br>The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50. |
| Disabled | RP-2000 disabled mortality table. |
| Retirement | Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. |
| Withdrawal | Select and Ultimate rates based on actual experience. Ultimate rates after the third year are shown in rate table. Select rates in the first three years are: |

| Year | Select Withdrawal Rates |
|---|---|
| 1 | 25% |
| 2 | 20% |
| 3 | 15% |

## SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

| | |
|---|---|
| Disability | Age-related rates based on experience; see table of sample rates. All incidences are assumed to be duty-related. |
| Allowance for combined service annuity | Liabilities for former members are increased by 30.00% to account for the effect of some participants having eligibility for a Combined Service Annuity. |
| Administrative expenses | In the valuation year, equal to prior year administrative expenses expressed as a percentage of prior year projected payroll. In each subsequent year, equal to the initial administrative expense percentage applied to payroll for the closed group. |
| Refund of contributions | Account balances accumulate interest until normal retirement date and are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit. |
| Commencement of deferred benefits | Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 55. |
| Percentage married | 85% of active members are assumed to be married. Actual marital status is used for members in payment status. |
| Age of spouse | Females are assumed to be three years younger than their male spouses. For members in payment status, actual spouse date of birth is used, if provided. |
| Eligible children | Retiring members are assumed to have no dependent children. |
| Form of payment | Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows:<br><br>Males: 5% elect 25% Joint & Survivor option<br>10% elect 50% Joint & Survivor option<br>10% elect 75% Joint & Survivor option<br>35% elect 100% Joint & Survivor option<br>Females: 5% elect 25% Joint & Survivor option<br>5% elect 50% Joint & Survivor option<br>5% elect 75% Joint & Survivor option<br>5% elect 100% Joint & Survivor option<br><br>Remaining married members and unmarried members are assumed to elect the Straight Life option.<br><br>Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity. |
| Eligibility testing | Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur. |
| Decrement operation | Withdrawal decrements do not operate during retirement eligibility. Decrements are assumed to occur mid-fiscal year. |
| Service credit accruals | It is assumed that members accrue one year of service credit per year. |
| Pay Increases | Pay increases are assumed to happen at the beginning of the fiscal year. This is equivalent to assuming that reported earnings are pensionable earnings for the year ending on the valuation date. |

## SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

| | |
|---|---|
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>Because PERA reclassifies disabled members as retirees once the member reaches Normal Retirement Age, we compare the members that PERA reports as retirees to our disabled group from the last valuation. If a member was disabled in the valuation, we reclassify that member as a disabled retiree in this year's valuation. We reclassified 45 retirees as disabled retirees in this valuation.<br><br>In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br><u>Data for active members:</u><br>There were 43 members reported with a salary less than $100. We used prior year salary (37 members), if available; otherwise high five salary with a 10% load to account for salary increases (six members). If neither prior year salary or high five salary was available, we assumed a value of $35,000 (zero members).<br><br>There were also 45 members reported without a gender and one member reported without a date of birth. We assumed an entry age of 31 and male gender.<br><br><u>Data for terminated members:</u><br>We calculated benefits for these members using the reported Average Salary and credited service. There were no members reported without Average Salary. If credited service was not reported (25 members), we used elapsed time from hire date to termination date (15 members), otherwise we assumed nine years of service (10 members). If termination date was not reported (11 members), we assumed the termination date was equal to the hire date plus credited service, otherwise the valuation date. If the reported termination date occurs prior to the reported hire date, the two dates were swapped.<br><br>There were no members reported without a date of birth. There were three members reported without a gender; male was assumed.<br><br><u>Data for retired members:</u><br>There were no members reported without a date of birth, gender or benefit. |
| Changes in actuarial assumptions | The assumed investment return was changed from 7.90% to 7.50%. The assumed future salary increases, payroll growth, and inflation were decreased by 0.25%. The single discount rate changed from 7.90% to 5.31%. |

## SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

| | Rate (%)* | | | | | |
|---|---|---|---|---|---|---|
| | Healthy Post-Retirement Mortality** | | Healthy Pre-Retirement Mortality** | | Disability Mortality | |
| **Age** | **Male** | **Female** | **Male** | **Female** | **Male** | **Female** |
| 20 | 0.03% | 0.02% | 0.03% | 0.02% | 2.26% | 0.75% |
| 25 | 0.04 | 0.02 | 0.04 | 0.02 | 2.26 | 0.75 |
| 30 | 0.04 | 0.03 | 0.04 | 0.03 | 2.26 | 0.75 |
| 35 | 0.06 | 0.05 | 0.06 | 0.05 | 2.26 | 0.75 |
| 40 | 0.09 | 0.06 | 0.09 | 0.06 | 2.26 | 0.75 |
| 45 | 0.13 | 0.10 | 0.13 | 0.10 | 2.26 | 0.75 |
| 50 | 0.60 | 0.24 | 0.20 | 0.16 | 2.90 | 1.15 |
| 55 | 0.54 | 0.35 | 0.27 | 0.24 | 3.54 | 1.65 |
| 60 | 0.66 | 0.56 | 0.43 | 0.38 | 4.20 | 2.18 |
| 65 | 1.16 | 0.91 | 0.67 | 0.59 | 5.02 | 2.80 |
| 70 | 1.93 | 1.52 | 0.98 | 0.88 | 6.26 | 3.76 |

* *Generally, mortality rates are expected to increase as age increases. These standard mortality rates have been adjusted slightly to prevent decreasing mortality rates. If the rates were not adjusted as described, we would not expect the valuation results to be materially different.*

** *These rates were adjusted for mortality improvements using projection scale AA.*

| | Withdrawal Rates | | Disability Retirement | |
|---|---|---|---|---|
| **Age** | **Male** | **Female** | **Male** | **Female** |
| 20 | 14.70% | 14.20% | 0.04% | 0.04% |
| 25 | 14.70% | 14.20% | 0.06% | 0.06% |
| 30 | 9.10% | 11.40% | 0.10% | 0.08% |
| 35 | 6.00% | 8.60% | 0.18% | 0.11% |
| 40 | 4.40% | 6.90% | 0.23% | 0.18% |
| 45 | 3.40% | 4.30% | 0.34% | 0.39% |
| 50 | 2.40% | 3.10% | 0.55% | 0.70% |
| 55 | 1.40% | 2.20% | 0.88% | 1.18% |
| 60 | 0.00% | 0.00% | 1.41% | 2.41% |
| 65 | 0.00% | 0.00% | 1.67% | 2.67% |

## SUMMARY OF ACTUARIAL ASSUMPTIONS (CONCLUDED)

| Age | Retirement |
|---|---|
| 50 | 3% |
| 51 | 2 |
| 52 | 2 |
| 53 | 2 |
| 54 | 5 |
| 55 | 20 |
| 56 | 8 |
| 57 | 8 |
| 58 | 8 |
| 59 | 8 |
| 60 | 15 |
| 61 | 15 |
| 62 | 30 |
| 63 | 30 |
| 64 | 30 |
| 65 | 40 |
| 66 | 40 |
| 67 | 40 |
| 68 | 40 |
| 69 | 40 |
| 70+ | 100 |

| Salary Scale | |
|---|---|
| Age | Increase |
| 20 | 8.50% |
| 25 | 7.25 |
| 30 | 6.25 |
| 35 | 5.75 |
| 40 | 5.25 |
| 45 | 4.50 |
| 50 | 4.50 |
| 55 | 4.25 |
| 60 | 3.75 |
| 65 | 3.50 |
| 70+ | 3.50 |

# SECTION G

## CALCULATION OF THE SINGLE DISCOUNT RATE

## CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the Fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the long-term expected rate of return is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a “risk-free” rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this calculation, the expected rate of return on pension plan investments is 7.50%; the municipal bond rate is 2.85%; and **the resulting single discount rate is 5.31%**.

Benefit payments projected to occur up through June 30, 2058 were fully funded and benefit payments projected to occur in the year ended June 30, 2059 were partially funded. Assets were projected to be fully depleted by the fiscal year ending June 30, 2059. Benefit payments were discounted using 7.50%, the long-term expected rate of return on pension plan investments, as long as assets were sufficient to fund the benefit payments. Beginning in the July 1, 2058 to June 30, 2059 fiscal year, when benefit payments exceed the Plan’s Fiduciary Net Position, benefit payments were discounted at 2.85%, the municipal bond rate. An equivalent single discount rate was determined that produced approximately the same present value of projected benefits when applied to all years of projected benefits as the present value of projected benefits using 7.50% through the point of asset depletion and 2.85% after. For more information on the calculation of the equivalent present value of projected benefits, see pages 37 through 38 of this report.

The tables in this section provide background for the development of the single discount rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

## SINGLE DISCOUNT RATE DEVELOPMENT
## PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS)

| | Payroll | | | Projected Contributions | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year Ending | Payroll for Current Employees | Payroll for New Employees | Total Employee Payroll | Contributions from Current Employees | Employer Contributions for Current Employees | Contributions on Future Payroll Toward Current UAL* | Total Contributions |
| 2016 | $ 188,816 | $ 0 | $ 188,816 | | | | |
| 2017 | 201,655 | 0 | 201,655 | $ 11,756 | $ 17,645 | $ 0 | $ 29,401 |
| 2018 | 190,639 | 17,570 | 208,209 | 11,114 | 16,681 | 4 | 27,799 |
| 2019 | 182,356 | 32,619 | 214,975 | 10,631 | 15,956 | 7 | 26,594 |
| 2020 | 175,440 | 46,522 | 221,962 | 10,228 | 15,351 | 9 | 25,588 |
| 2021 | 169,007 | 60,169 | 229,176 | 9,853 | 14,788 | 12 | 24,653 |
| 2022 | 162,753 | 73,871 | 236,624 | 9,489 | 14,241 | 15 | 23,745 |
| 2023 | 156,785 | 87,529 | 244,314 | 9,141 | 13,719 | 18 | 22,878 |
| 2024 | 151,050 | 101,205 | 252,255 | 8,806 | 13,217 | 20 | 22,043 |
| 2025 | 145,254 | 115,199 | 260,453 | 8,468 | 12,710 | 23 | 21,201 |
| 2026 | 139,550 | 129,368 | 268,918 | 8,136 | 12,211 | 26 | 20,373 |
| 2027 | 133,882 | 143,775 | 277,657 | 7,805 | 11,715 | 29 | 19,549 |
| 2028 | 128,250 | 158,431 | 286,681 | 7,477 | 11,222 | 32 | 18,731 |
| 2029 | 122,755 | 173,243 | 295,998 | 7,157 | 10,741 | 35 | 17,933 |
| 2030 | 117,297 | 188,321 | 305,618 | 6,838 | 10,263 | 38 | 17,139 |
| 2031 | 111,789 | 203,762 | 315,551 | 6,517 | 9,782 | 41 | 16,340 |
| 2032 | 106,258 | 219,548 | 325,806 | 6,195 | 9,298 | 44 | 15,537 |
| 2033 | 100,736 | 235,659 | 336,395 | 5,873 | 8,814 | 47 | 14,734 |
| 2034 | 95,276 | 252,052 | 347,328 | 5,555 | 8,337 | 50 | 13,942 |
| 2035 | 89,863 | 268,753 | 358,616 | 5,239 | 7,863 | 54 | 13,156 |
| 2036 | 84,509 | 285,762 | 370,271 | 4,927 | 7,395 | 57 | 12,379 |
| 2037 | 79,223 | 303,082 | 382,305 | 4,619 | 6,932 | 61 | 11,612 |
| 2038 | 73,946 | 320,784 | 394,730 | 4,311 | 6,470 | 64 | 10,845 |
| 2039 | 68,628 | 338,930 | 407,558 | 4,001 | 6,005 | 68 | 10,074 |
| 2040 | 63,335 | 357,469 | 420,804 | 3,692 | 5,542 | 71 | 9,305 |
| 2041 | 58,138 | 376,342 | 434,480 | 3,389 | 5,087 | 75 | 8,551 |
| 2042 | 53,036 | 395,565 | 448,601 | 3,092 | 4,641 | 79 | 7,812 |
| 2043 | 48,045 | 415,135 | 463,180 | 2,801 | 4,204 | 83 | 7,088 |
| 2044 | 43,090 | 435,144 | 478,234 | 2,512 | 3,770 | 87 | 6,369 |
| 2045 | 38,147 | 455,629 | 493,776 | 2,224 | 3,338 | 91 | 5,653 |
| 2046 | 33,285 | 476,539 | 509,824 | 1,940 | 2,912 | 95 | 4,947 |
| 2047 | 28,604 | 497,789 | 526,393 | 1,668 | 2,503 | 100 | 4,271 |
| 2048 | 24,266 | 519,235 | 543,501 | 1,415 | 2,123 | 104 | 3,642 |
| 2049 | 20,345 | 540,820 | 561,165 | 1,186 | 1,780 | 108 | 3,074 |
| 2050 | 16,833 | 562,570 | 579,403 | 981 | 1,473 | 113 | 2,567 |
| 2051 | 13,687 | 584,546 | 598,233 | 798 | 1,198 | 117 | 2,113 |
| 2052 | 10,848 | 606,828 | 617,676 | 632 | 949 | 121 | 1,702 |
| 2053 | 8,338 | 629,412 | 637,750 | 486 | 730 | 126 | 1,342 |
| 2054 | 6,175 | 652,302 | 658,477 | 360 | 540 | 130 | 1,030 |
| 2055 | 4,387 | 675,491 | 679,878 | 256 | 384 | 135 | 775 |
| 2056 | 2,998 | 698,976 | 701,974 | 175 | 262 | 140 | 577 |
| 2057 | 1,970 | 722,818 | 724,788 | 115 | 172 | 145 | 432 |
| 2058 | 1,247 | 747,097 | 748,344 | 73 | 109 | 149 | 331 |
| 2059 | 759 | 771,906 | 772,665 | 44 | 66 | 154 | 264 |
| 2060 | 440 | 797,336 | 797,776 | 26 | 38 | 159 | 223 |
| 2061 | 241 | 823,463 | 823,704 | 14 | 21 | 165 | 200 |
| 2062 | 121 | 850,354 | 850,475 | 7 | 11 | 170 | 188 |
| 2063 | 53 | 878,062 | 878,115 | 3 | 5 | 176 | 184 |
| 2064 | 21 | 906,633 | 906,654 | 1 | 2 | 181 | 184 |
| 2065 | 7 | 936,113 | 936,120 | 0 | 1 | 187 | 188 |
| 2066 | 2 | 966,542 | 966,544 | 0 | 0 | 193 | 193 |

**Contributions related to future employees in excess of normal cost and expenses of 14.56% of pay.*

# SINGLE DISCOUNT RATE DEVELOPMENT
## PROJECTION OF CONTRIBUTIONS (DOLLARS IN THOUSANDS) (CONCLUDED)

| | Payroll | | | Projected Contributions | | | |
|---|---|---|---|---|---|---|---|
| Fiscal Year Ending | Payroll for Current Employees | Payroll for New Employees | Total Employee Payroll | Contributions from Current Employees | Employer Contributions for Current Employees | Contributions on Future Payroll Toward Current UAL* | Total Contributions |
| 2067 | $ 0 | $ 997,957 | $ 997,957 | $ 0 | $ 0 | $ 200 | $ 200 |
| 2068 | 0 | 1,030,390 | 1,030,390 | 0 | 0 | 206 | 206 |
| 2069 | 0 | 1,063,878 | 1,063,878 | 0 | 0 | 213 | 213 |
| 2070 | 0 | 1,098,454 | 1,098,454 | 0 | 0 | 220 | 220 |
| 2071 | 0 | 1,134,154 | 1,134,154 | 0 | 0 | 227 | 227 |
| 2072 | 0 | 1,171,014 | 1,171,014 | 0 | 0 | 234 | 234 |
| 2073 | 0 | 1,209,072 | 1,209,072 | 0 | 0 | 242 | 242 |
| 2074 | 0 | 1,248,366 | 1,248,366 | 0 | 0 | 250 | 250 |
| 2075 | 0 | 1,288,938 | 1,288,938 | 0 | 0 | 258 | 258 |
| 2076 | 0 | 1,330,829 | 1,330,829 | 0 | 0 | 266 | 266 |
| 2077 | 0 | 1,374,081 | 1,374,081 | 0 | 0 | 275 | 275 |
| 2078 | 0 | 1,418,738 | 1,418,738 | 0 | 0 | 284 | 284 |
| 2079 | 0 | 1,464,847 | 1,464,847 | 0 | 0 | 293 | 293 |
| 2080 | 0 | 1,512,455 | 1,512,455 | 0 | 0 | 302 | 302 |
| 2081 | 0 | 1,561,610 | 1,561,610 | 0 | 0 | 312 | 312 |
| 2082 | 0 | 1,612,362 | 1,612,362 | 0 | 0 | 322 | 322 |
| 2083 | 0 | 1,664,764 | 1,664,764 | 0 | 0 | 333 | 333 |
| 2084 | 0 | 1,718,869 | 1,718,869 | 0 | 0 | 344 | 344 |
| 2085 | 0 | 1,774,732 | 1,774,732 | 0 | 0 | 355 | 355 |
| 2086 | 0 | 1,832,411 | 1,832,411 | 0 | 0 | 366 | 366 |
| 2087 | 0 | 1,891,964 | 1,891,964 | 0 | 0 | 378 | 378 |
| 2088 | 0 | 1,953,453 | 1,953,453 | 0 | 0 | 391 | 391 |
| 2089 | 0 | 2,016,940 | 2,016,940 | 0 | 0 | 403 | 403 |
| 2090 | 0 | 2,082,490 | 2,082,490 | 0 | 0 | 416 | 416 |
| 2091 | 0 | 2,150,171 | 2,150,171 | 0 | 0 | 430 | 430 |
| 2092 | 0 | 2,220,052 | 2,220,052 | 0 | 0 | 444 | 444 |
| 2093 | 0 | 2,292,204 | 2,292,204 | 0 | 0 | 458 | 458 |
| 2094 | 0 | 2,366,700 | 2,366,700 | 0 | 0 | 473 | 473 |
| 2095 | 0 | 2,443,618 | 2,443,618 | 0 | 0 | 489 | 489 |
| 2096 | 0 | 2,523,036 | 2,523,036 | 0 | 0 | 505 | 505 |
| 2097 | 0 | 2,605,034 | 2,605,034 | 0 | 0 | 521 | 521 |
| 2098 | 0 | 2,689,698 | 2,689,698 | 0 | 0 | 538 | 538 |
| 2099 | 0 | 2,777,113 | 2,777,113 | 0 | 0 | 555 | 555 |
| 2100 | 0 | 2,867,369 | 2,867,369 | 0 | 0 | 573 | 573 |
| 2101 | 0 | 2,960,559 | 2,960,559 | 0 | 0 | 592 | 592 |
| 2102 | 0 | 3,056,777 | 3,056,777 | 0 | 0 | 611 | 611 |
| 2103 | 0 | 3,156,122 | 3,156,122 | 0 | 0 | 631 | 631 |
| 2104 | 0 | 3,258,696 | 3,258,696 | 0 | 0 | 652 | 652 |
| 2105 | 0 | 3,364,604 | 3,364,604 | 0 | 0 | 673 | 673 |
| 2106 | 0 | 3,473,953 | 3,473,953 | 0 | 0 | 695 | 695 |
| 2107 | 0 | 3,586,857 | 3,586,857 | 0 | 0 | 717 | 717 |
| 2108 | 0 | 3,703,430 | 3,703,430 | 0 | 0 | 741 | 741 |
| 2109 | 0 | 3,823,791 | 3,823,791 | 0 | 0 | 765 | 765 |
| 2110 | 0 | 3,948,064 | 3,948,064 | 0 | 0 | 790 | 790 |
| 2111 | 0 | 4,076,377 | 4,076,377 | 0 | 0 | 815 | 815 |
| 2112 | 0 | 4,208,859 | 4,208,859 | 0 | 0 | 842 | 842 |
| 2113 | 0 | 4,345,647 | 4,345,647 | 0 | 0 | 869 | 869 |
| 2114 | 0 | 4,486,880 | 4,486,880 | 0 | 0 | 897 | 897 |
| 2115 | 0 | 4,632,704 | 4,632,704 | 0 | 0 | 927 | 927 |
| 2116 | 0 | 4,783,267 | 4,783,267 | 0 | 0 | 957 | 957 |

**Contributions related to future employees in excess of normal cost and expenses of 14.56% of pay.*

# SINGLE DISCOUNT RATE DEVELOPMENT
# PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Total Contributions | Projected Benefit Payments | Projected Administrative Expenses | Projected Investment Earnings at 7.50% | Projected Ending Plan Net Position |
|---|---|---|---|---|---|---|
| | (a) | (b) | (c) | (d) | (e) | (f)=(a)+(b)-(c)-(d)+(e) |
| 2017 | $ 507,783 | $ 29,401 | $ 13,909 | $ 302 | $ 38,643 | $ 561,616 |
| 2018 | 561,616 | 27,799 | 16,043 | 286 | 42,544 | 615,630 |
| 2019 | 615,630 | 26,594 | 18,227 | 274 | 46,470 | 670,193 |
| 2020 | 670,193 | 25,588 | 20,671 | 263 | 50,436 | 725,283 |
| 2021 | 725,283 | 24,653 | 23,385 | 254 | 54,434 | 780,731 |
| 2022 | 780,731 | 23,744 | 26,543 | 244 | 58,443 | 836,131 |
| 2023 | 836,131 | 22,877 | 29,802 | 235 | 62,446 | 891,417 |
| 2024 | 891,417 | 22,043 | 33,282 | 227 | 66,434 | 946,385 |
| 2025 | 946,385 | 21,201 | 37,086 | 218 | 70,386 | 1,000,668 |
| 2026 | 1,000,668 | 20,372 | 41,384 | 209 | 74,269 | 1,053,716 |
| 2027 | 1,053,716 | 19,549 | 45,849 | 201 | 78,053 | 1,105,268 |
| 2028 | 1,105,268 | 18,731 | 50,393 | 192 | 81,722 | 1,155,136 |
| 2029 | 1,155,136 | 17,932 | 55,174 | 184 | 85,257 | 1,202,967 |
| 2030 | 1,202,967 | 17,139 | 60,136 | 176 | 88,633 | 1,248,427 |
| 2031 | 1,248,427 | 16,340 | 65,383 | 168 | 91,820 | 1,291,036 |
| 2032 | 1,291,036 | 15,536 | 70,691 | 159 | 94,791 | 1,330,513 |
| 2033 | 1,330,513 | 14,735 | 76,369 | 151 | 97,513 | 1,366,241 |
| 2034 | 1,366,241 | 13,942 | 82,156 | 143 | 99,951 | 1,397,835 |
| 2035 | 1,397,835 | 13,156 | 87,881 | 135 | 102,081 | 1,425,056 |
| 2036 | 1,425,056 | 12,379 | 93,790 | 127 | 103,877 | 1,447,395 |
| 2037 | 1,447,395 | 11,611 | 99,844 | 119 | 105,301 | 1,464,344 |
| 2038 | 1,464,344 | 10,845 | 105,788 | 111 | 106,326 | 1,475,616 |
| 2039 | 1,475,616 | 10,074 | 111,807 | 103 | 106,921 | 1,480,701 |
| 2040 | 1,480,701 | 9,306 | 117,670 | 95 | 107,059 | 1,479,301 |
| 2041 | 1,479,301 | 8,552 | 123,371 | 87 | 106,716 | 1,471,111 |
| 2042 | 1,471,111 | 7,812 | 128,787 | 80 | 105,876 | 1,455,932 |
| 2043 | 1,455,932 | 7,088 | 133,884 | 72 | 104,523 | 1,433,587 |
| 2044 | 1,433,587 | 6,370 | 138,840 | 65 | 102,639 | 1,403,691 |
| 2045 | 1,403,691 | 5,653 | 143,685 | 57 | 100,192 | 1,365,794 |
| 2046 | 1,365,794 | 4,948 | 148,304 | 50 | 97,154 | 1,319,542 |
| 2047 | 1,319,542 | 4,270 | 152,607 | 43 | 93,502 | 1,264,664 |
| 2048 | 1,264,664 | 3,642 | 156,335 | 36 | 89,226 | 1,201,161 |
| 2049 | 1,201,161 | 3,074 | 159,349 | 31 | 84,331 | 1,129,186 |
| 2050 | 1,129,186 | 2,567 | 161,663 | 25 | 78,830 | 1,048,895 |
| 2051 | 1,048,895 | 2,112 | 163,366 | 21 | 72,729 | 960,349 |
| 2052 | 960,349 | 1,703 | 164,561 | 16 | 66,029 | 863,504 |
| 2053 | 863,504 | 1,342 | 165,240 | 13 | 58,727 | 758,320 |
| 2054 | 758,320 | 1,031 | 165,410 | 9 | 50,821 | 644,753 |
| 2055 | 644,753 | 775 | 165,044 | 7 | 42,307 | 522,784 |
| 2056 | 522,784 | 577 | 164,118 | 4 | 33,187 | 392,426 |
| 2057 | 392,426 | 432 | 162,643 | 3 | 23,459 | 253,671 |
| 2058 | 253,671 | 331 | 160,643 | 2 | 13,122 | 106,479 |
| 2059 | 106,479 | 265 | 158,158 | 1 | 2,172 | 0 |
| 2060 | 0 | 224 | 155,226 | 1 | 0 | 0 |
| 2061 | 0 | 200 | 151,886 | 0 | 0 | 0 |
| 2062 | 0 | 188 | 148,173 | 0 | 0 | 0 |
| 2063 | 0 | 184 | 144,110 | 0 | 0 | 0 |
| 2064 | 0 | 184 | 139,724 | 0 | 0 | 0 |
| 2065 | 0 | 188 | 135,041 | 0 | 0 | 0 |
| 2066 | 0 | 193 | 130,082 | 0 | 0 | 0 |

# SINGLE DISCOUNT RATE DEVELOPMENT
## PROJECTION OF PLAN FIDUCIARY NET POSITION (DOLLARS IN THOUSANDS) (CONCLUDED)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Total Contributions | Projected Benefit Payments | Projected Administrative Expenses | Projected Investment Earnings at 7.50% | Projected Ending Plan Net Position |
|---|---|---|---|---|---|---|
| | (a) | (b) | (c) | (d) | (e) | (f)=(a)+(b)-(c)-(d)+(e) |
| 2067 | $ - | $ 200 | $ 124,867 | $ 0 | $ - | $ - |
| 2068 | 0 | 206 | 119,420 | 0 | 0 | 0 |
| 2069 | 0 | 213 | 113,762 | 0 | 0 | 0 |
| 2070 | 0 | 220 | 107,923 | 0 | 0 | 0 |
| 2071 | 0 | 227 | 101,928 | 0 | 0 | 0 |
| 2072 | 0 | 234 | 95,804 | 0 | 0 | 0 |
| 2073 | 0 | 242 | 89,587 | 0 | 0 | 0 |
| 2074 | 0 | 250 | 83,315 | 0 | 0 | 0 |
| 2075 | 0 | 258 | 77,026 | 0 | 0 | 0 |
| 2076 | 0 | 266 | 70,766 | 0 | 0 | 0 |
| 2077 | 0 | 275 | 64,577 | 0 | 0 | 0 |
| 2078 | 0 | 284 | 58,505 | 0 | 0 | 0 |
| 2079 | 0 | 293 | 52,594 | 0 | 0 | 0 |
| 2080 | 0 | 302 | 46,884 | 0 | 0 | 0 |
| 2081 | 0 | 312 | 41,419 | 0 | 0 | 0 |
| 2082 | 0 | 322 | 36,246 | 0 | 0 | 0 |
| 2083 | 0 | 333 | 31,400 | 0 | 0 | 0 |
| 2084 | 0 | 344 | 26,914 | 0 | 0 | 0 |
| 2085 | 0 | 355 | 22,815 | 0 | 0 | 0 |
| 2086 | 0 | 366 | 19,118 | 0 | 0 | 0 |
| 2087 | 0 | 378 | 15,830 | 0 | 0 | 0 |
| 2088 | 0 | 391 | 12,945 | 0 | 0 | 0 |
| 2089 | 0 | 403 | 10,451 | 0 | 0 | 0 |
| 2090 | 0 | 416 | 8,329 | 0 | 0 | 0 |
| 2091 | 0 | 430 | 6,552 | 0 | 0 | 0 |
| 2092 | 0 | 444 | 5,090 | 0 | 0 | 0 |
| 2093 | 0 | 458 | 3,905 | 0 | 0 | 0 |
| 2094 | 0 | 473 | 2,960 | 0 | 0 | 0 |
| 2095 | 0 | 489 | 2,218 | 0 | 0 | 0 |
| 2096 | 0 | 505 | 1,645 | 0 | 0 | 0 |
| 2097 | 0 | 521 | 1,207 | 0 | 0 | 0 |
| 2098 | 0 | 538 | 878 | 0 | 0 | 0 |
| 2099 | 0 | 555 | 632 | 0 | 0 | 0 |
| 2100 | 0 | 573 | 452 | 0 | 0 | 0 |
| 2101 | 0 | 592 | 321 | 0 | 0 | 0 |
| 2102 | 0 | 611 | 226 | 0 | 0 | 0 |
| 2103 | 0 | 631 | 158 | 0 | 0 | 0 |
| 2104 | 0 | 652 | 111 | 0 | 0 | 0 |
| 2105 | 0 | 673 | 77 | 0 | 0 | 0 |
| 2106 | 0 | 695 | 54 | 0 | 0 | 0 |
| 2107 | 0 | 717 | 38 | 0 | 0 | 0 |
| 2108 | 0 | 741 | 26 | 0 | 0 | 0 |
| 2109 | 0 | 765 | 19 | 0 | 0 | 0 |
| 2110 | 0 | 790 | 13 | 0 | 0 | 0 |
| 2111 | 0 | 815 | 9 | 0 | 0 | 0 |
| 2112 | 0 | 842 | 6 | 0 | 0 | 0 |
| 2113 | 0 | 869 | 4 | 0 | 0 | 0 |
| 2114 | 0 | 897 | 3 | 0 | 0 | 0 |
| 2115 | 0 | 927 | 2 | 0 | 0 | 0 |
| 2116 | 0 | 957 | 1 | 0 | 0 | 0 |

# SINGLE DISCOUNT RATE DEVELOPMENT
# PRESENT VALUES OF PROJECTED BENEFITS (DOLLARS IN THOUSANDS)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Benefit Payments | Funded Portion of Benefit Payments | Unfunded Portion of Benefit Payments | Present Value of Funded Benefit Payments using Expected Return Rate (v) | Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf) | Present Value of Benefit Payments using Single Discount Rate (sdr) |
|---|---|---|---|---|---|---|---|
| (a) | (b) | (c) | (d) | (e) | (f)=(d)*v^((a)-.5) | (g)=(e)*vf ^((a)-.5) | (h)=((c)/(1+sdr)^(a-.5) |
| 2017 | $ 507,783 | $ 13,909 | $ 13,909 | $ 0 | $ 13,415 | $ 0 | $ 13,554 |
| 2018 | 561,616 | 16,043 | 16,043 | 0 | 14,394 | 0 | 14,846 |
| 2019 | 615,629 | 18,227 | 18,227 | 0 | 15,212 | 0 | 16,016 |
| 2020 | 670,193 | 20,671 | 20,671 | 0 | 16,049 | 0 | 17,249 |
| 2021 | 725,282 | 23,385 | 23,385 | 0 | 16,889 | 0 | 18,530 |
| 2022 | 780,730 | 26,543 | 26,543 | 0 | 17,832 | 0 | 19,971 |
| 2023 | 836,130 | 29,802 | 29,802 | 0 | 18,625 | 0 | 21,294 |
| 2024 | 891,416 | 33,282 | 33,282 | 0 | 19,348 | 0 | 22,581 |
| 2025 | 946,385 | 37,086 | 37,086 | 0 | 20,056 | 0 | 23,893 |
| 2026 | 1,000,668 | 41,384 | 41,384 | 0 | 20,819 | 0 | 25,319 |
| 2027 | 1,053,716 | 45,849 | 45,849 | 0 | 21,456 | 0 | 26,637 |
| 2028 | 1,105,268 | 50,393 | 50,393 | 0 | 21,937 | 0 | 27,801 |
| 2029 | 1,155,135 | 55,174 | 55,174 | 0 | 22,343 | 0 | 28,904 |
| 2030 | 1,202,966 | 60,136 | 60,136 | 0 | 22,653 | 0 | 29,916 |
| 2031 | 1,248,426 | 65,383 | 65,383 | 0 | 22,911 | 0 | 30,886 |
| 2032 | 1,291,035 | 70,691 | 70,691 | 0 | 23,043 | 0 | 31,711 |
| 2033 | 1,330,512 | 76,369 | 76,369 | 0 | 23,157 | 0 | 32,531 |
| 2034 | 1,366,239 | 82,156 | 82,156 | 0 | 23,173 | 0 | 33,232 |
| 2035 | 1,397,833 | 87,881 | 87,881 | 0 | 23,059 | 0 | 33,756 |
| 2036 | 1,425,054 | 93,790 | 93,790 | 0 | 22,892 | 0 | 34,210 |
| 2037 | 1,447,393 | 99,844 | 99,844 | 0 | 22,670 | 0 | 34,582 |
| 2038 | 1,464,343 | 105,788 | 105,788 | 0 | 22,344 | 0 | 34,794 |
| 2039 | 1,475,615 | 111,807 | 111,807 | 0 | 21,967 | 0 | 34,920 |
| 2040 | 1,480,700 | 117,670 | 117,670 | 0 | 21,506 | 0 | 34,899 |
| 2041 | 1,479,299 | 123,371 | 123,371 | 0 | 20,975 | 0 | 34,745 |
| 2042 | 1,471,109 | 128,787 | 128,787 | 0 | 20,368 | 0 | 34,442 |
| 2043 | 1,455,930 | 133,884 | 133,884 | 0 | 19,697 | 0 | 34,001 |
| 2044 | 1,433,586 | 138,840 | 138,840 | 0 | 19,001 | 0 | 33,482 |
| 2045 | 1,403,689 | 143,685 | 143,685 | 0 | 18,292 | 0 | 32,904 |
| 2046 | 1,365,792 | 148,304 | 148,304 | 0 | 17,563 | 0 | 32,250 |
| 2047 | 1,319,541 | 152,607 | 152,607 | 0 | 16,812 | 0 | 31,513 |
| 2048 | 1,264,663 | 156,335 | 156,335 | 0 | 16,021 | 0 | 30,655 |
| 2049 | 1,201,158 | 159,349 | 159,349 | 0 | 15,191 | 0 | 29,671 |
| 2050 | 1,129,185 | 161,663 | 161,663 | 0 | 14,336 | 0 | 28,585 |
| 2051 | 1,048,894 | 163,366 | 163,366 | 0 | 13,476 | 0 | 27,430 |
| 2052 | 960,349 | 164,561 | 164,561 | 0 | 12,628 | 0 | 26,238 |
| 2053 | 863,504 | 165,240 | 165,240 | 0 | 11,795 | 0 | 25,018 |
| 2054 | 758,319 | 165,410 | 165,410 | 0 | 10,984 | 0 | 23,781 |
| 2055 | 644,752 | 165,044 | 165,044 | 0 | 10,195 | 0 | 22,533 |
| 2056 | 522,783 | 164,118 | 164,118 | 0 | 9,430 | 0 | 21,277 |
| 2057 | 392,424 | 162,643 | 162,643 | 0 | 8,693 | 0 | 20,023 |
| 2058 | 253,669 | 160,643 | 160,643 | 0 | 7,988 | 0 | 18,780 |
| 2059 | 106,477 | 158,158 | 106,477 | 51,681 | 4,925 | 15,655 | 17,557 |
| 2060 | 0 | 155,226 | 0 | 155,226 | 0 | 45,717 | 16,363 |
| 2061 | 0 | 151,886 | 0 | 151,886 | 0 | 43,494 | 15,204 |
| 2062 | 0 | 148,173 | 0 | 148,173 | 0 | 41,255 | 14,085 |
| 2063 | 0 | 144,110 | 0 | 144,110 | 0 | 39,012 | 13,008 |
| 2064 | 0 | 139,724 | 0 | 139,724 | 0 | 36,776 | 11,976 |
| 2065 | 0 | 135,041 | 0 | 135,041 | 0 | 34,559 | 10,992 |
| 2066 | 0 | 130,082 | 0 | 130,082 | 0 | 32,367 | 10,054 |

# SINGLE DISCOUNT RATE DEVELOPMENT
# PRESENT VALUES OF PROJECTED BENEFITS (DOLLARS IN THOUSANDS) (CONCLUDED)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Benefit Payments | Funded Portion of Benefit Payments | Unfunded Portion of Benefit Payments | Present Value of Funded Benefit Payments using Expected Return Rate (v) | Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf) | Present Value of Benefit Payments using Single Discount Rate (sdr) |
|---|---|---|---|---|---|---|---|
| (a) | (b) | (c) | (d) | (e) | (f)=(d)*v^((a)-.5) | (g)=(e)*vf ^((a)-.5) | (h)=((c)/(1+sdr)^(a-.5) |
| 2067 | $ - | $ 124,867 | $ - | $ 124,867 | $ - | $ 30,209 | $ 9,165 |
| 2068 | 0 | 119,420 | 0 | 119,420 | 0 | 28,090 | 8,323 |
| 2069 | 0 | 113,762 | 0 | 113,762 | 0 | 26,018 | 7,529 |
| 2070 | 0 | 107,923 | 0 | 107,923 | 0 | 23,999 | 6,783 |
| 2071 | 0 | 101,928 | 0 | 101,928 | 0 | 22,037 | 6,083 |
| 2072 | 0 | 95,804 | 0 | 95,804 | 0 | 20,139 | 5,429 |
| 2073 | 0 | 89,587 | 0 | 89,587 | 0 | 18,311 | 4,821 |
| 2074 | 0 | 83,315 | 0 | 83,315 | 0 | 16,557 | 4,258 |
| 2075 | 0 | 77,026 | 0 | 77,026 | 0 | 14,883 | 3,738 |
| 2076 | 0 | 70,766 | 0 | 70,766 | 0 | 13,294 | 3,261 |
| 2077 | 0 | 64,577 | 0 | 64,577 | 0 | 11,795 | 2,826 |
| 2078 | 0 | 58,505 | 0 | 58,505 | 0 | 10,390 | 2,431 |
| 2079 | 0 | 52,594 | 0 | 52,594 | 0 | 9,082 | 2,075 |
| 2080 | 0 | 46,884 | 0 | 46,884 | 0 | 7,871 | 1,757 |
| 2081 | 0 | 41,419 | 0 | 41,419 | 0 | 6,761 | 1,474 |
| 2082 | 0 | 36,246 | 0 | 36,246 | 0 | 5,753 | 1,225 |
| 2083 | 0 | 31,400 | 0 | 31,400 | 0 | 4,846 | 1,007 |
| 2084 | 0 | 26,914 | 0 | 26,914 | 0 | 4,038 | 820 |
| 2085 | 0 | 22,815 | 0 | 22,815 | 0 | 3,328 | 660 |
| 2086 | 0 | 19,118 | 0 | 19,118 | 0 | 2,712 | 525 |
| 2087 | 0 | 15,830 | 0 | 15,830 | 0 | 2,183 | 413 |
| 2088 | 0 | 12,945 | 0 | 12,945 | 0 | 1,736 | 321 |
| 2089 | 0 | 10,451 | 0 | 10,451 | 0 | 1,362 | 246 |
| 2090 | 0 | 8,329 | 0 | 8,329 | 0 | 1,056 | 186 |
| 2091 | 0 | 6,552 | 0 | 6,552 | 0 | 808 | 139 |
| 2092 | 0 | 5,090 | 0 | 5,090 | 0 | 610 | 103 |
| 2093 | 0 | 3,905 | 0 | 3,905 | 0 | 455 | 75 |
| 2094 | 0 | 2,960 | 0 | 2,960 | 0 | 335 | 54 |
| 2095 | 0 | 2,218 | 0 | 2,218 | 0 | 244 | 38 |
| 2096 | 0 | 1,645 | 0 | 1,645 | 0 | 176 | 27 |
| 2097 | 0 | 1,207 | 0 | 1,207 | 0 | 126 | 19 |
| 2098 | 0 | 878 | 0 | 878 | 0 | 89 | 13 |
| 2099 | 0 | 632 | 0 | 632 | 0 | 62 | 9 |
| 2100 | 0 | 452 | 0 | 452 | 0 | 43 | 6 |
| 2101 | 0 | 321 | 0 | 321 | 0 | 30 | 4 |
| 2102 | 0 | 226 | 0 | 226 | 0 | 20 | 3 |
| 2103 | 0 | 158 | 0 | 158 | 0 | 14 | 2 |
| 2104 | 0 | 111 | 0 | 111 | 0 | 9 | 1 |
| 2105 | 0 | 77 | 0 | 77 | 0 | 6 | 1 |
| 2106 | 0 | 54 | 0 | 54 | 0 | 4 | 1 |
| 2107 | 0 | 38 | 0 | 38 | 0 | 3 | 0 |
| 2108 | 0 | 26 | 0 | 26 | 0 | 2 | 0 |
| 2109 | 0 | 19 | 0 | 19 | 0 | 1 | 0 |
| 2110 | 0 | 13 | 0 | 13 | 0 | 1 | 0 |
| 2111 | 0 | 9 | 0 | 9 | 0 | 1 | 0 |
| 2112 | 0 | 6 | 0 | 6 | 0 | 0 | 0 |
| 2113 | 0 | 4 | 0 | 4 | 0 | 0 | 0 |
| 2114 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |
| 2115 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 2116 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| | | | | **Totals** | $ 756,118 | $ 578,326,181 | $ 1,334,444 |

# SECTION H

## GLOSSARY OF TERMS

# GLOSSARY OF TERMS

***Actuarial Accrued Liability (AAL)*** The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."

***Actuarial Assumptions*** These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.

***Accrued Service*** Service credited under the system which was rendered before the date of the actuarial valuation.

***Actuarial Equivalent*** A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.

***Actuarial Cost Method*** A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.

***Actuarial Gain (Loss)*** The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.

***Actuarial Present Value (APV)*** The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future benefit payments at predetermined rates of interest to reflect the expected effects of the time value (present value) of money and the probabilities of payment.

***Actuarial Valuation*** The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.

***Actuarial Valuation Date*** The date as of which an actuarial valuation is performed.

***Actuarially Determined Contribution (ADC)*** A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

# GLOSSARY OF TERMS

***Amortization Payment*** The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

***Amortization Method*** The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

***Cost-of-Living Adjustments*** Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

***Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)*** A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

***Covered-Employee Payroll*** The payroll of covered employees, which is typically only the pensionable pay (meets the statutory salary definition) and does not include pay above any pay cap.

***Deferred Inflows and Outflows of Resources*** The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

***Discount Rate or Single Discount Rate*** For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

***Entry Age Actuarial Cost Method or Entry Age Normal (EAN)*** The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

# GLOSSARY OF TERMS

| | |
|---|---|
| ***GASB*** | The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities. |
| ***Fiduciary Net Position*** | The fiduciary net position is the value of the assets of the trust. |
| ***Long-Term Expected Rate of Return*** | The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio. |
| ***Money-Weighted Rate of Return*** | The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense. |
| ***Multiple-Employer Defined Benefit Pension Plan*** | A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer. |
| ***Municipal Bond Rate*** | The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted. |
| ***Net Pension Liability (NPL)*** | The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan. |
| ***Non-Employer Contribution Entities*** | Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statements No. 67 and No. 68 plan members are not considered non-employer contribution entities. |
| ***Normal Cost*** | The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method. |
| ***Other Postemployment Benefits (OPEB)*** | All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits. |
| ***Real Rate of Return*** | The real rate of return is the rate of return on an investment after adjustment to eliminate inflation. |
| ***Service Cost*** | The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year. |

# GLOSSARY OF TERMS

***Total Pension Expense***

The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Changes in Benefit Terms
4. Employee Contributions
5. Projected Earnings on Plan Investments
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to the difference between expected and actual measurement of the Total Pension Liability
9. Recognition of Outflow (Inflow) of Resources due to Assumption Changes
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings in pension plan investments

***Total Pension Liability (TPL)***

The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

***Unfunded Actuarial Accrued Liability (UAAL)***

The UAAL is the difference between actuarial accrued liability and valuation assets.

***Valuation Assets***

The valuation assets are the plan fiduciary net position used in determining the net pension liability of the plan. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.

Gabriel Roeder Smith & Company
Consultants & Actuaries

**PUBLIC EMPLOYEES RETIREMENT ASSOCIATION OF MINNESOTA**

# PUBLIC EMPLOYEES POLICE AND FIRE PLAN

GASB STATEMENTS NO. 67 AND NO. 68 ACCOUNTING AND FINANCIAL REPORTING FOR PENSIONS

JUNE 30, 2016

GRS
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December 2, 2016

Public Employees Retirement Association of Minnesota
Public Employees Police and Fire Plan
St. Paul, Minnesota

Dear Trustees of the Public Employees Police and Fire Plan:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 for the Public Employees Police and Fire Plan ("PEPFP"), as amended by Statement No. 82. These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust. GASB Statement No. 82 is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting statements.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statements No. 67 and No. 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 67 may produce significantly different results. The information in this report is calculated on a total plan basis. PERA is responsible for preparing the Schedule of Employer Allocations and the Schedule of Pension Amounts by Employer. This report may be provided to parties other than the Public Employees Retirement Association (PERA) only in its entirety and only with the permission of PERA. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by PERA, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not audited.

This report complements the actuarial valuation report for funding purposes that was or will be provided to the System and should be considered in conjunction with that report. Please see the actuarial valuation report as of June 30, 2016 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the Public Employees Police and Fire Plan as of the measurement date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

The signing actuaries are independent of the plan sponsor.

Brian B. Murphy and Bonita J. Wurst are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

By ______________________
Brian B. Murphy
FSA, EA, FCA, MAAA

By ______________________
Bonita J. Wurst
ASA, EA, FCA, MAAA

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# SECTION A

## EXECUTIVE SUMMARY

# EXECUTIVE SUMMARY
# AS OF JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | 2016 |
|---|---|---|
| Actuarial Valuation Date | | June 30, 2016 |
| Measurement Date of the Net Pension Liability | | June 30, 2016 |
| Employer's Fiscal Year Ending Date (Reporting Date) | | Varies by Employer |
| | | |
| **Membership** | | |
| Number of | | |
| - Service Retirements | | 7,222 |
| - Survivors | | 1,873 |
| - Disability Retirements | | 1,257 |
| - Deferred Retirements | | 1,490 |
| - Terminated other non-vested | | 1,059 |
| - Active Members | | 11,398 |
| - Total | | 24,299 |
| Covered Payroll | $ | 881,222 |
| | | |
| **Net Pension Liability** | | |
| Total Pension Liability | $ | 11,111,264 |
| Plan Fiduciary Net Position | | 7,098,090 |
| Net Pension Liability | $ | 4,013,174 |
| Plan Fiduciary Net Position as a Percentage of Total Pension Liability | | 63.88% |
| Net Pension Liability as a Percentage of Covered Payroll | | 455.41% |
| | | |
| **Development of the Single Discount Rate** | | |
| Single Discount Rate | | 5.60% |
| Long-Term Expected Rate of Investment Return | | 7.50% |
| Long-Term Municipal Bond Rate* | | 2.85% |
| Last year ending June 30 in the 2017 to 2116 projection period for which projected benefit payments are fully funded | | 2056 |
| | | |
| **Total Pension Expense/ (Income)** | **$** | **616,099** |

**Deferred Outflows and Inflows by Source Arising from Current and Prior Periods to be Recognized in Future Pension Expenses**

| | | Deferred Outflows of Resources | | Deferred Inflows of Resources |
|---|---|---|---|---|
| Difference between expected and actual experience | $ | 907 | $ | 460,387 |
| Changes in assumptions | | 2,370,597 | | 0 |
| Net difference between projected and actual earnings on pension plan investments | | 612,439 | | 266,465 |
| Total | $ | 2,983,943 | $ | 726,852 |

** Based on the Bond Buyer 20-Bond Index of general obligation municipal bonds as of June 30, 2016*

# DISCUSSION

**Accounting Standard**

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans* establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions* establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements. Governmental Accounting Standards Board (GASB) Statement No. 82, Pension Issues, is an amendment to Statements No. 67, No. 68, and No. 73, intended to improve consistency in the application of the accounting standards.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

**Financial Statements**

GASB Statement No. 68 requires state and local governmental employers to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to PEPFP subsequent to the measurement date of June 30, 2016.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a Statement of Fiduciary Net Position and a Statement of Changes in Fiduciary Net Position in accordance with GASB Statement No. 67. The *Statement of Fiduciary Net Position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *Statement of Changes in Fiduciary Net Position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

**Notes to Financial Statements**

GASB Statement No. 68 requires the notes to the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

Both GASB Statements No. 67 and No. 68 require the notes to the financial statements for the employers and pension plans to include certain descriptive information about the pension plans through which the pension benefits are provided. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the classes of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than the current discount rate used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with Statement No. 67. This information includes:

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

**Required Supplementary Information**

Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

## Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

## General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.50% on the market value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain approximately level as a percentage of payroll.
2. The unfunded actuarial accrued liabilities will increase and not be eliminated.
3. The funded status of the plan will decrease.
4. The plan may eventually become insolvent and unable to pay benefits.

The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

## Limitations of Funded Status Measurements

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 regard 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 other words of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, 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.

## Limitation of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

## Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2016 and a measurement date of June 30, 2016.

## Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a single discount rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the long-term expected rate of return on pension plan investments is 5.60%; the municipal bond rate is 2.85% (based on the weekly rate closest to but not later than the measurement date of the Bond Buyer 20-Year GO Index) and the resulting single discount rate is 5.60%. The long-term expected rate of return is based on a review of inflation and investment assumptions, dated September 11, 2014, and a recent asset liability study obtained by the Minnesota State Board of Investment.

## Effective Date and Transition

GASB Statements No. 67 and No. 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively. Earlier application is encouraged by the GASB.

# SECTION B

FINANCIAL STATEMENTS

# PENSION EXPENSE UNDER GASB STATEMENT NO. 68
# FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

**A. Expense**

| | | | |
|---|---|---|---|
| 1. | Service Cost | $ | 194,352 |
| 2. | Interest on the Total Pension Liability | | 658,198 |
| 3. | Current-Period Benefit Changes | | 0 |
| 4. | Employee Contributions (made negative for addition here) | | (95,172) |
| 5. | Projected Earnings on Plan Investments (made negative for addition here) | | (571,002) |
| 6. | Pension Plan Administrative Expense | | 906 |
| 7. | Other Changes in Plan Fiduciary Net Position | | (3) |
| 8. | Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability | | |
| | *Arising from Current Reporting Period* | | (62,596) |
| 9. | Recognition of Outflow (Inflow) of Resources due to assumption changes | | |
| | *Arising from Current Reporting Period* | | 441,725 |
| 10. | Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments | | |
| | *Arising from Current Reporting Period* | | 115,990 |
| 11. | **Increase/(Decrease) from Experience in the Current Reporting Period** | **$** | **682,398** |
| 12. | Recognition of Outflow (Inflow) of Resources due to differences between expected and actual experience in the measurement of the Total Pension Liability | | |
| | *Arising from Prior Reporting Periods* | | (36,550) |
| 13. | Recognition of Outflow (Inflow) of Resources due to assumption changes | | |
| | *Arising from Prior Reporting Periods* | | 53,991 |
| 14. | Recognition of Outflow (Inflow) of Resources due to the difference between projected (7.90%) and actual earnings on Pension Plan Investments | | |
| | *Arising from Prior Reporting Periods* | | (83,740) |
| 15. | **Total Pension Expense / (Income)** | **$** | **616,099** |

# STATEMENT OF OUTFLOWS AND INFLOWS ARISING FROM CURRENT REPORTING PERIOD
# FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | |
|---|---|
| **A. Outflows (Inflows) of Resources due to Liabilities** | |
| 1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses | (375,575) |
| 2. Assumption Changes (gains) or losses | 2,650,350 |
| 3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years} | 6.0000 |
| 4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability | (62,596) |
| 5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes | 441,725 |
| 6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities | 379,129 |
| 7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability | (312,979) |
| 8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes | 2,208,625 |
| 9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities | 1,895,646 |
| **B. Outflows (Inflows) of Resources due to Assets** | |
| 1. Net difference between projected and actual earnings on pension plan investments (gains) or losses | 579,951 |
| 2. Recognition period for Assets {in years} | 5.0000 |
| 3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets | 115,990 |
| 4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets | 463,961 |

# Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods
# Fiscal Year Ended June 30, 2016 (Dollars in Thousands)

**A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense**

| | Outflows of Resources | Inflows of Resources | Net Outflows of Resources |
|---|---|---|---|
| 1. Due to Liabilities | $ 496,018 | $ 99,448 | $ 396,570 |
| 2. Due to Assets | 165,482 | 133,232 | 32,250 |
| **3. Total** | $ 661,500 | $ 232,680 | $ 428,820 |

**B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense**

| | Outflows of Resources | Inflows of Resources | Net Outflows of Resources |
|---|---|---|---|
| 1. Differences between expected and actual experience | $ 302 | $ 99,448 | $ (99,146) |
| 2. Assumption Changes | 495,716 | 0 | 495,716 |
| 3. Net Difference between projected and actual earnings on pension plan investments | 165,482 | 133,232 | 32,250 |
| **4. Total** | $ 661,500 | $ 232,680 | $ 428,820 |

**C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses**

| | Deferred Outflows of Resources | Deferred Inflows of Resources | Net Deferred Outflows of Resources |
|---|---|---|---|
| 1. Differences between expected and actual experience | $ 907 | $ 460,387 | $ (459,480) |
| 2. Assumption Changes | 2,370,597 | 0 | 2,370,597 |
| 3. Net Difference between projected and actual earnings on pension plan investments | 612,439 | 266,465 | 345,974 |
| **4. Total** | $ 2,983,943 | $ 726,852 | $ 2,257,091 |

**D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses**

| Year Ending June 30 | Net Deferred Outflows of Resources |
|---|---|
| 2017 | $ 428,820 |
| 2018 | 428,819 |
| 2019 | 562,054 |
| 2020 | 458,267 |
| 2021 | 379,131 |
| Thereafter | 0 |
| **Total** | $ 2,257,091 |

# STATEMENT OF FIDUCIARY NET POSITION AS OF JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | Market Value | | | |
|---|---|---|---|---|
| **Assets in Trust** | **June 30, 2016** | | **June 30, 2015** | |
| Cash, Equivalents, Short Term Securities | $ 145,521 | | $ 141,036 | |
| Fixed Income | 1,751,552 | | 1,727,568 | |
| Equity | 4,282,601 | | 4,563,032 | |
| SBI Alternative | 908,179 | | 905,931 | |
| Other | 0 | | 0 | |
| **Total Assets in Trust** | **$ 7,087,853** | | **$ 7,337,567** | |
| | | | | |
| Assets Receivable | 15,918 | * | 14,267 | ** |
| Amounts Payable | (5,681) | | (3,130) | |
| **Net Position Restricted for Pensions** | **$ 7,098,090** | | **$ 7,348,704** | |

** Includes $13.648 contribution from Minneapolis to be paid by July 15, 2016.*
*** Includes $11.534 contribution from Minneapolis paid by July 15, 2015.*

# STATEMENT OF CHANGES IN FIDUCIARY NET POSITION FOR YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| **Change in Assets** | | **Market Value** | |
|---|---|---|---|
| **Year Ending** | | **June 30, 2016** | **June 30, 2015** |
| 1. | Fund balance at market value at beginning of year | $ 7,348,704 | $ 7,273,100 |
| 2. | Contributions | | |
| | a. Member | 95,172 | 88,733 |
| | b. Employer | 156,065 * | 144,317 ** |
| | c. Other sources | 9,000 | 9,000 |
| | d. Total contributions | 260,237 | 242,050 |
| 3. | Investment income | | |
| | a. Investment income/(loss) | 549 | 327,786 |
| | b. Investment expenses | (9,498) | (10,230) |
| | c. Net subtotal | (8,949) | 317,556 |
| 4. | Other | 3 | 84 |
| **5.** | **Total additions:** *(2.d.) + (3.c.) + (4.)* | **$ 251,291** | **$ 559,690** |
| 6. | Benefits Paid | | |
| | a. Annuity benefits | (498,608) | (481,330) |
| | b. Refunds | (2,391) | (1,953) |
| | c. Total benefits paid | (500,999) | (483,283) |
| 7. | Expenses | | |
| | a. Other | 0 | 0 |
| | b. Administrative | (906) | (803) |
| | c. Total expenses | (906) | (803) |
| **8.** | **Total deductions:** *(6.c.) + (7.c.)* | **(501,905)** | **(484,086)** |
| 9. | Net increase (decrease) in net position: *(5) + (8)* | (250,614) | 75,604 |
| **10.** | **Net position restricted for pensions** | **$ 7,098,090** | **$ 7,348,704** |
| 11. | Approximate return on market value of assets | -0.1% | 4.4% |

** Includes $13.648 contribution from Minneapolis to be paid by July 15, 2016.*
*** Includes $11.534 contribution from Minneapolis paid by July 15, 2015.*

# SECTION C

## REQUIRED SUPPLEMENTARY INFORMATION

# SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS CURRENT PERIOD FISCAL YEAR ENDED JUNE 30, 2016 (DOLLARS IN THOUSANDS)

| | | |
|---|---|---|
| **A. Total pension liability** | | |
| 1. Service cost | $ | 194,352 |
| 2. Interest on the total pension liability | | 658,198 |
| 3. Changes of benefit terms | | 0 |
| 4. Difference between expected and actual experience of the total pension liability* | | (375,575) |
| 5. Changes of assumptions | | 2,650,350 |
| 6. Benefit payments, including refunds of employee contributions | | (500,999) |
| 7. Net change in total pension liability | $ | 2,626,326 |
| 8. Total pension liability – beginning | | 8,484,938 |
| 9. Total pension liability – ending | **$** | **11,111,264** |
| **B. Plan fiduciary net position** | | |
| 1. Contributions – employer | $ | 165,065 |
| 2. Contributions – employee | | 95,172 |
| 3. Net investment income | | (8,949) |
| 4. Benefit payments, including refunds of employee contributions | | (500,999) |
| 5. Pension Plan Administrative Expense | | (906) |
| 6. Other | | 3 |
| 7. Net change in plan fiduciary net position | $ | (250,614) |
| 8. Plan fiduciary net position – beginning | | 7,348,704 |
| 9. Plan fiduciary net position – ending | **$** | **7,098,090** |
| **C. Net pension liability** | **$** | **4,013,174** |
| **D. Plan fiduciary net position as a percentage of the total pension liability** | | **63.88%** |
| **E. Covered-employee payroll** | **$** | **881,222** |
| **F. Net pension liability as a percentage of covered-employee payroll** | | **455.41%** |

**Includes impact of changes in expected timing of future COLA increases.*

# SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
# SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS MULTIYEAR (DOLLARS IN THOUSANDS)

**Last 10 Fiscal Years (which may be built prospectively)**

| Fiscal year ending June 30, | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Pension Liability** | | | | | | | | | | |
| Service Cost | $ 194,352 | $ 187,959 | $ 169,124 | | | | | | | |
| Interest on the Total Pension Liability | 658,198 | 648,233 | 598,165 | | | | | | | |
| Benefit Changes | 0 | 0 | 0 | | | | | | | |
| Difference between Expected and Actual Experience | (375,575) | (221,112) | 1,813 | | | | | | | |
| Assumption Changes | 2,650,350 | - | 323,945 | | | | | | | |
| Benefit Payments | (498,608) | (481,330) | (452,462) | | | | | | | |
| Refunds | (2,391) | (1,953) | (1,633) | | | | | | | |
| **Net Change in Total Pension Liability** | 2,626,326 | 131,797 | 638,952 | | | | | | | |
| **Total Pension Liability - Beginning** | 8,484,938 | 8,353,141 | 7,714,189 | | | | | | | |
| **Total Pension Liability - Ending (a)** | $ 11,111,264 | $ 8,484,938 | $ 8,353,141 | | | | | | | |
| **Plan Fiduciary Net Position** | | | | | | | | | | |
| Employer Contributions | $ 165,065 | $ 153,317 | $ 141,632 | | | | | | | |
| Employee Contributions | 95,172 | 88,733 | 81,213 | | | | | | | |
| Pension Plan Net Investment Income | (8,949) | 317,556 | 1,158,389 | | | | | | | |
| Benefit Payments | (498,608) | (481,330) | (452,462) | | | | | | | |
| Refunds | (2,391) | (1,953) | (1,633) | | | | | | | |
| Pension Plan Administrative Expense | (906) | (803) | (798) | | | | | | | |
| Other | 3 | 84 | 18 | | | | | | | |
| **Net Change in Plan Fiduciary Net Position** | (250,614) | 75,604 | 926,359 | | | | | | | |
| **Plan Fiduciary Net Position - Beginning** | 7,348,704 | 7,273,100 | 6,346,741 | | | | | | | |
| **Plan Fiduciary Net Position - Ending (b)** | $ 7,098,090 | $ 7,348,704 | $ 7,273,100 | | | | | | | |
| **Net Pension Liability - Ending (a) - (b)** | 4,013,174 | 1,136,234 | 1,080,041 | | | | | | | |
| **Plan Fiduciary Net Position as a Percentage of Total Pension Liability** | 63.88 % | 86.61 % | 87.07 % | | | | | | | |
| **Covered Employee Payroll** | $ 881,222 | $ 845,076 | $ 820,333 | | | | | | | |
| **Net Pension Liability as a Percentage of Covered Employee Payroll** | 455.41 % | 134.45 % | 131.66 % | | | | | | | |

**Notes to Schedule:**

N/A

# SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
# SCHEDULE OF THE NET PENSION LIABILITY MULTIYEAR
# (DOLLARS IN THOUSANDS)

## Last 10 Fiscal Years (which may be built prospectively)

| FY Ending June 30, | Total Pension Liability | Plan Net Position | Net Pension Liability | Plan Net Position as a % of Total Pension Liability | Covered Payroll | Net Pension Liability as a % of Covered Payroll |
|---|---|---|---|---|---|---|
| 2007 | | | | | | |
| 2008 | | | | | | |
| 2009 | | | | | | |
| 2010 | | | | | | |
| 2011 | | | | | | |
| 2012 | | | | | | |
| 2013 | | | | | | |
| 2014 | $ 8,353,141 | $ 7,273,100 | $ 1,080,041 | 87.07% | $ 820,333 | 131.66% |
| 2015 | 8,484,938 | 7,348,704 | $ 1,136,234 | 86.61% | 845,076 | 134.45% |
| 2016 | 11,111,264 | 7,098,090 | 4,013,174 | 63.88% | 881,222 | 455.41% |

# SCHEDULE OF CONTRIBUTIONS MULTIYEAR (DOLLARS IN THOUSANDS)

## Last 10 Fiscal Years

| FY Ending June 30, | Actuarially Determined Contribution | Actual Contribution | Contribution Deficiency (Excess) | Covered Payroll | Actual Contribution as a % of Covered Payroll |
|---|---|---|---|---|---|
| 2007 | $ 116,325 | $ 74,707 | $ 41,618 | $ 648,342 | 11.52% |
| 2008 | 144,548 | 87,023 | 57,525 | 703,701 | 12.37 |
| 2009 | 140,591 | 101,548 | 39,043 | 733,164 | 13.85 |
| 2010 | 150,220 | 107,066 | 43,154 | 740,101 | 14.47 |
| 2011 | 124,284 | 109,604 | 14,680 | 775,806 | 14.13 |
| 2012 | 152,369 | 121,891 | 30,478 | 794,417 | 15.34 |
| 2013 | 189,254 | 125,995 | 63,259 | 796,188 | 15.82 |
| 2014 | 163,985 | 141,632 | 22,353 | 820,333 | 17.27 |
| 2015 | 197,325 | 153,317 | 44,008 | 845,076 | 18.14 |
| 2016 | 189,375 | 165,065 | 24,310 | 881,222 | 18.73 |

## NOTES TO SCHEDULE OF CONTRIBUTIONS

| | |
|---|---|
| **Valuation Date:** | June 30, 2016 |
| Notes | Actuarially determined contribution rates are calculated as of each June 30 and apply to the fiscal year beginning on the day after the measurement date. |

**Methods and Assumptions Used to Determine Contribution Rates:**

| | |
|---|---|
| Actuarial Cost Method | Entry Age Normal |
| Amortization Method | Level Percentage of Payroll, Closed |
| Remaining Amortization Period | 25 years |
| Asset Valuation Method | 5-Year smoothed market; no corridor |
| Inflation | 2.75% |
| Payroll Growth | 3.50% |
| Salary Increases | 4.25% to 12.75% including inflation |
| Investment Rate of Return | 8.00% |
| Retirement Age | Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2011 valuation pursuant to an experience study of the period 2004 - 2009, prepared by a former actuary. |
| Mortality | RP-2000 annuitant generational mortality table, projected with scale AA, white collar adjustment. |

**Other Information:**

| | |
|---|---|
| Notes | The plan is assumed to pay a 2.50% post retirement benefit increase beginning January 1, 2051.<br>See separate funding report as of July 1, 2016 for additional detail. |

# SCHEDULE OF INVESTMENT RETURNS MULTIYEAR

## Last 10 Fiscal Years

| FY Ending June 30, | Annual Return[1] |
|---|---|
| 2007 | |
| 2008 | |
| 2009 | |
| 2010 | |
| 2011 | |
| 2012 | |
| 2013 | |
| 2014 | |
| 2015 | |
| 2016 | |

[1] *Annual money-weighted rate of return, net of investment expenses.*

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

# SECTION D

## ADDITIONAL FINANCIAL STATEMENT DISCLOSURES

# ASSET ALLOCATION

| Asset Class | Target Allocation | Long-Term Expected Real Rate of Return |
|---|---|---|
| Domestic Fixed Income | | |
| International Fixed Income | | |
| Domestic Equity | | |
| International Equity | | |
| Private Equity | | |
| Real Estate | | |
| Commodities | | |
| Cash | | |
| **Total** | | |

It is our understanding that this exhibit will be prepared by PERA with assistance from the State Board of Investment. Please provide a copy of the final exhibit for our files.

## Single Discount Rate

A single discount rate of 5.60% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 7.50% and the municipal bond rate of 2.85%. The projection of cash flows used to determine this single discount rate assumed that plan member and employer contributions will be made at the current statutory rates. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance the benefit payments through the year ending June 30, 2056. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year ending June 30, 2056, and the municipal bond rate was applied to all benefit payments after the point of asset depletion.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 5.60%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher:

### SENSITIVITY OF NET PENSION LIABILITY TO THE SINGLE DISCOUNT RATE ASSUMPTION

*(Dollars in Thousands)*

| | 1% Decrease 4.60% | Current Single Discount Rate Assumption 5.60% | 1% Increase 6.60% |
|---|---|---|---|
| Total Pension Liability | $ 12,716,001 | $ 11,111,264 | $ 9,800,072 |
| Net Position Restricted for Pensions | 7,098,090 | 7,098,090 | 7,098,090 |
| Net Pension Liability | **$ 5,617,911** | **$ 4,013,174** | **$ 2,701,982** |

# GASB STATEMENT NO. 68 RECONCILIATION (DOLLARS IN THOUSANDS)
# CURRENT REPORTING PERIOD

| | Total Pension Liability (a) | Plan Fiduciary Net Position (b) | Net Pension Liability (a) - (b) | Current Period: Deferred Outflows | Current Period: Deferred Inflows | Current Period: Pension Expense* |
|---|---|---|---|---|---|---|
| **Balance Beginning of Year** | **$ 8,484,938** | **$ 7,348,704** | **$ 1,136,234** | | | |
| **Changes for the Year:** | | | | | | |
| Service Cost | $ 194,352 | | $ 194,352 | | | $ 194,352 |
| Interest on Total Pension Liability | 658,198 | | 658,198 | | | 658,198 |
| Interest on Fiduciary Net Position | | $ 571,002 | (571,002) | | | (571,002) |
| Changes in Benefit Terms | | | | | | |
| Liability Experience Gains and Losses | (375,575) | | (375,575) | | $ 312,979 | (62,596) |
| Changes in Assumptions | 2,650,350 | | 2,650,350 | 2,208,625 | | 441,725 |
| Contributions - Employer | | 165,065 | (165,065) | | | |
| Contributions - Employees | | 95,172 | (95,172) | | | (95,172) |
| Asset Gain/(Loss) | | (579,951) | 579,951 | $ 463,961 | | 115,990 |
| Benefit Payouts | (500,999) | (500,999) | | | | |
| Administrative Expenses | | (906) | 906 | | | 906 |
| Other | | 3 | (3) | | | (3) |
| **Net Changes** | **$ 2,626,326** | **$ (250,614)** | **$ 2,876,940** | **$ 2,672,586** | **$ 312,979** | **$ 682,398** |
| **Balance End of Year** | **$ 11,111,264** | **$ 7,098,090** | **$ 4,013,174** | | | |

** Pension Expense from Experience in the Current Reporting Period.*

# GASB STATEMENT NO. 68 RECONCILIATION (DOLLARS IN THOUSANDS)
## CURRENT AND PRIOR REPORTING PERIODS

| | Total Pension Liability (a) | Plan Fiduciary Net Position (b) | Net Pension Liability (a) - (b) | Deferred Outflows | Deferred Inflows | Net Deferred Outflows Prior Year | Total Pension Expense* |
|---|---|---|---|---|---|---|---|
| **Balance Beginning of Year** | **$ 8,484,938** | **$ 7,348,704** | **$ 1,136,234** | | | | |
| **Changes for the Year:** | | | | | | | |
| Service Cost | $ 194,352 | | $ 194,352 | | | | $ 194,352 |
| Interest on Total Pension Liability | 658,198 | | 658,198 | | | | 658,198 |
| Interest on Fiduciary Net Position | | $ 571,002 | (571,002) | | | | (571,002) |
| Changes in Benefit Terms | | | | | | | |
| Liability Experience Gains and Losses | (375,575) | | (375,575) | $ 907 | $ 460,387 | $ (183,051) | (99,146) |
| Changes in Assumptions | 2,650,350 | | 2,650,350 | 2,370,597 | | 215,963 | 495,716 |
| Contributions - Employer | | 165,065 | (165,065) | | | | |
| Contributions - Employees | | 95,172 | (95,172) | | | | (95,172) |
| Asset Gain/(Loss) | | (579,951) | 579,951 | 612,439 | 266,465 | (201,727) | 32,250 |
| Benefit Payouts | (500,999) | (500,999) | | | | | |
| Administrative Expenses | | (906) | 906 | | | | 906 |
| Other | | 3 | (3) | | | | (3) |
| **Net Changes** | **$ 2,626,326** | **$ (250,614)** | **$ 2,876,940** | | | | **$ 616,099** |
| **Balance End of Year** | **$ 11,111,264** | **$ 7,098,090** | **$ 4,013,174** | **$ 2,983,943** | **$ 726,852** | **$ (168,815)** | |

** Pension Expense from Experience in the Current and Prior Reporting Periods*

# SUMMARY OF POPULATION STATISTICS

| | | Terminated | | Recipients | | | |
|---|---|---|---|---|---|---|---|
| | Actives | Deferred Retirement | Other Non-Vested | Service Retirement | Disability Retirement | Survivor | Total |
| **Members on 7/1/2015** | **11,157** | **1,560** | **995** | **7,121** | **1,194** | **1,894** | **23,921** |
| New members | 710 | | | | | | 710 |
| Return to active | 60 | (31) | (29) | 0 | 0 | 0 | 0 |
| Terminated non-vested | (84) | 0 | 84 | 0 | 0 | 0 | 0 |
| Service retirements | (178) | (91) | 0 | 269 | 0 | 0 | 0 |
| Terminated deferred | (172) | 172 | 0 | 0 | 0 | 0 | 0 |
| Terminated refund/transfer | (34) | (18) | (19) | 0 | 0 | 0 | (71) |
| Deaths | (8) | (2) | (1) | (153) | (21) | (107) | (292) |
| New beneficiary | 0 | 0 | 0 | 0 | 0 | 98 | 98 |
| Disabled | (54) | 0 | 0 | 0 | 54 | 0 | 0 |
| Data adjustments | 1 | (100) | 29 | (15) | 30 | (12) | (67) |
| Net change | 241 | (70) | 64 | 101 | 63 | (21) | 378 |
| **Members on 6/30/2016** | **11,398** | **1,490** | **1,059** | **7,222** | **1,257** | **1,873** | **24,299** |

# SECTION E

## SUMMARY OF BENEFITS

# SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN

Following is a summary of the major plan provisions used in the valuation of this report. PERA is solely responsible for the validity, accuracy and comprehensiveness of this information. If any of the plan provisions shown below are not accurate and complete, the valuation results may differ significantly from those shown in this report and may require a revision of this report.

**Plan year** — July 1 through June 30

**Eligibility** — All full-time and certain part-time police officers and fire fighters, and certain paramedics, who are not contributing to any other local retirement fund.

**Contributions**

| | Member | Employer |
|---|---|---|
| Percent of Salary | | |
| January 1, 2015 & later | 10.80 | 16.20 |

Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).

**State Contributions** — $9 million paid annually on October 1 until both PERA P&F and MSRS State Patrol become 90% funded (on a Market Value of Assets basis).

**Allowable service** — Police and Fire service during which member contributions were made. May also include certain leaves of absence and military service.

**Salary** — Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leaves and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage.

**Average salary** — Average of the five highest successive years of salary. Average Salary is based on all Allowable Service if less than five years.

**Vesting**

| | Vesting Percent if First Hired | | |
|---|---|---|---|
| **Years of Service** | **Before 7/1/2010** | **After 6/30/2010 & before 7/1/2014** | **After 6/30/2014** |
| <3 | 0% | 0% | 0% |
| 3 – 4 | 100 | 0 | 0 |
| 5 | 100 | 50 | 0 |
| 6 | 100 | 60 | 0 |
| 7 | 100 | 70 | 0 |
| 8 | 100 | 80 | 0 |
| 9 | 100 | 90 | 0 |
| 10 | 100 | 100 | 50 |
| 11 | 100 | 100 | 55 |
| 12 | 100 | 100 | 60 |
| 13 | 100 | 100 | 65 |
| 14 | 100 | 100 | 70 |
| 15 | 100 | 100 | 75 |
| 16 | 100 | 100 | 80 |
| 17 | 100 | 100 | 85 |
| 18 | 100 | 100 | 90 |
| 19 | 100 | 100 | 95 |
| 20+ | 100 | 100 | 100 |

## SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN (CONTINUED)

**Retirement**

Normal retirement benefit

| | |
|---|---|
| Age/service requirement | Age 55 and at least partially vested. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service. |
| Amount | 3.0% of Average Salary for each year of Allowable Service (up to 33 years if hired after June 30, 2014), pro rata for completed months. A pro-rata share of member contributions will be refunded at retirement for excess service. |

Early retirement

| | |
|---|---|
| Age/service requirement | Age 50 and at least partially vested. |
| Amount | Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date and 0.10% (0.20% for members enrolled in the plan after June 30, 2007) reduction for each month the member is under age 55. If the effective date of retirement is after June 30, 2019, the reduction is 5/12% for each month that the member is under age 55 at the time of retirement. The change in early retirement factors will be phased in over a five-year period for retirements occurring between July 1, 2014 and June 30, 2019. |
| Form of payment | Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are:<br><br>25%, 50%, 75% or 100% Joint and Survivor with bounce back feature. The Joint and Survivor options are determined on an actuarially equivalent basis, but with no actuarial reduction for the bounce back feature. |
| Benefit Increases | Benefit recipients receive a future annual 1.00% post-retirement benefit increase. The annual adjustment will equal 2.50% any time the fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.50% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.00%.<br><br>A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. For retirements after May 31, 2014, the first increase will be delayed two years.<br><br>Members retired under laws in effect before July 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is the greater of \$25 times each full year of Allowable Service or the difference between \$400 times each full year of Allowable Service and the sum of benefits paid from any Minnesota public pension plan plus cash payments from the Social Security Administration for the preceding fiscal year July 1, 1988 through June 30, 1989. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from the fund. Effective January 1, 2002, annual lump sum payment is divided by 12 and paid as a monthly life annuity in the annuity form elected. |

# SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN (CONTINUED)

**Disability**

Duty disability benefit

| | |
|---|---|
| Age/service requirement | Physically or mentally unable to perform normal duties as a police officer or fire fighter as a direct result of an act of duty specific to protecting property and personal safety of others. Members age 55 or older with 20 or more years of Allowable Service are not eligible to apply for duty disability benefits. |
| Amount | 60.00%, plus an additional 3.00% for each year of service in excess of 20 years, of Average Salary paid until Normal Retirement Age, or for 60 months, whichever is later. The retirement benefit is then recalculated but is never lower than the disability benefit.<br><br>If a member became disabled prior to July 1, 1997 but did not commence their benefit before July 1, 1997, the benefit is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in post-retirement interest rates from 5.00% to 6.00%. |

Regular disability benefit

| | |
|---|---|
| Age/service requirement | Physically or mentally unable to perform normal duties as a police officer or fire fighter with one year of Allowable Service. Members age 55 or older with 15 or more years of Allowable Service are not eligible to apply for regular disability benefits. |
| Amount | 45.00% of Average Salary, paid until Normal Retirement Age, or for 60 months, whichever is later. The retirement benefit is then recalculated but is never lower than the disability benefit. Benefits for total and permanent regular disability are calculated as 3.00% of Average Salary for each year of Allowable Service, with a minimum of 45.00% of Average Salary.<br><br>If a member became disabled prior to July 1, 1997 but did not commence his or her benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in post-retirement interest rates from 5.00% to 6.00%. |
| Benefit increases | Same as for retirement. |

Retirement benefit

| | |
|---|---|
| Age/service requirement | Upon cessation of disability benefits. |
| Amount | Any optional annuity continues. Otherwise, the larger of the disability benefit paid before age 55 or the normal retirement benefit available at age 55, or an actuarially equivalent optional annuity. |
| Form of payment | Same as for retirement. |
| Benefit increases | Same as for retirement. |

# SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN (CONTINUED)

**Death**

Surviving spouse benefit

| | |
|---|---|
| Age/service requirement | Death of active member or regular disabled member with surviving spouse whose disability benefit accrued before July 1, 2007, who is vested at death (service requirement is waived if death occurs in the line of duty). |
| Amount | 50.00% of salary (60.00% if death occurs in the line of duty after June 30, 2007) averaged over last six months. Benefit paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991.<br><br>If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Benefit increases | Same as for retirement. |

Surviving dependent children's benefit

| | |
|---|---|
| Age/service requirement | Non-duty related death of active member or regular disabled member with eligible dependent child. |
| Amount | 10.00% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 50.00% of salary and maximum of 70.00% of salary. Benefits paid until child marries, dies, or attains age 18 (age 23 if full-time student). |

Duty disability surviving spouse benefit

| | |
|---|---|
| Age/service requirement | Member who is totally and permanently disabled who dies before age 55 or within five years of the effective date of the disability benefit, whichever is later. |
| Amount | 60.00% of salary averaged over last six months. Benefits paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991. |
| Benefit increases | Same as for retirement. |

## SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN (CONTINUED)

**Death (Continued)**

Duty disability surviving dependent children's benefit

| | |
|---|---|
| Age/service requirement | Death of a member with an eligible dependent child who was disabled in the line of duty and died as a direct result of the disability. |
| Amount | 10.00% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 60.00% of salary and maximum of 80.00% of salary. Benefits paid until child marries, dies, or attains age 18 (age 23 if full-time student).<br><br>If a member became deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |

Surviving spouse optional annuity

| | |
|---|---|
| Age/service requirement | Active member dies before age 55. Benefits commence when member would have been age 55 or as early as age 50 if qualified for early retirement, benefits commence immediately if member had 30 years of service. |
| Amount | Survivor's payment of the 100% joint and survivor benefit the member could have elected if terminated. Alternatively, spouse may elect refund of deceased's contributions with interest if there are no dependent children.<br><br>If a member became deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Benefit increases | Same as for retirement. |

# SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN (CONTINUED)

| | |
|---|---|
| **Termination** | |
| Refund of contributions | |
| Age/service requirement | Termination of public service. |
| Amount | If member terminated before July 1, 2011, member's contributions credited with 6% interest compounded annually prior to July 1, 2011 and 4% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4% interest compounded annually.<br><br>A deferred annuity may be elected in lieu of a refund if vested. |
| Deferred benefit | |
| Age/service requirement | Partially or fully vested. |
| Amount | Benefit computed under law in effect at termination and increased by the following percentage (augmentation) compounded annually for terminations prior to 2012:<br><br>(a.) 0.00% before July 1, 1971;<br>(b.) 5.00% from July 1, 1971 to January 1, 1981;<br>(c.) 3.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012;<br>(d.) 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; and<br>(e.) 1.00% from January 1, 2012 thereafter.<br><br>Members who terminate after 2011 will receive no future augmentation.<br><br>If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997 and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%. |
| Form of payment | Same as for retirement. |
| **Optional form conversion factors** | Actuarially equivalent factors based on RP-2000 for healthy annuitants, white collar adjustment, projected to 2027 using scale AA, no setbacks, blended 90% males, and 7.00% interest. The interest rate assumption will change to 6.50% on the earlier of the effective date of the next mortality adjustment or July 1, 2017. |

# SUMMARY OF PLAN PROVISIONS – POLICE & FIRE PLAN (CONCLUDED)

| | |
|---|---|
| **Combined service annuity** | Members are eligible for combined service benefits if they:<br><br>(a.) Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or<br>(b.) Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010).<br><br>Other requirements for combined service include:<br><br>(a.) Member must have at least six months of allowable service credit in each plan worked under; and<br>(b.) Member may not be in receipt of a benefit from another plan.<br><br>Members who meet the above requirements must have their benefit based on the following:<br><br>(a.) Allowable service in all covered plans is combined in order to determine eligibility for early retirement.<br>(b.) Average salary is based on the high five consecutive years during their entire service in all covered plans. |
| **Changes in plan provisions** | There have been no changes to plan provisions since the previous valuation. |

# SUMMARY OF PLAN PROVISIONS – MINNEAPOLIS POLICE RELIEF ASSOCIATION

| | |
|---|---|
| **Normal retirement benefit** | Monthly benefits are equal to the number of units multiplied by the unit values described herein. Units are based on service, as follows:<br><br>**Service** / **Units**<br>20 — 35.0 units<br>21 — 36.6 units<br>22 — 38.2 units<br>23 — 39.8 units<br>24 — 41.4 units<br>25 or more — 43.0 units<br><br>Members must be at least age 50 with 5 years of service to receive this benefit. |
| **Unit values** | **Calendar Year** / **Unit Value**<br>2012 — $ 104.651<br>2013 — 109.011<br>2014 — 114.825<br>2015 — 124.031<br><br>Unit values after 2015 are assumed to increase 1.00% per year through 2050 and 2.50% thereafter. |
| **Surviving spouse's benefit** | Annual benefit based on 23 units for the surviving spouse of an active or retired member. Upon retirement, members may choose an alternative form of payment that provides 50%, 75% or 100% of their benefit to their spouse after their death. The units are adjusted if one of these alternate forms is selected. |
| **Surviving children's benefit** | Annual benefit based on 8 units for each surviving child of an active or retired member. Benefits continue to age 18 or if the child is a full-time student, to age 22. The total benefit for surviving children and spouse combined is limited to 41 units. |
| **Contributions** | Member and employer contributions equal to 8.00% of the monthly unit value multiplied by 80 are required for each member. After 25 years of service, member contributions are paid to a separate health insurance account. |
| **Benefit Increases** | Benefit recipients receive a future annual 1.00% post-retirement benefit increase. The annual adjustment will equal 2.50%, any time the Fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.50% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.00%. |

# SUMMARY OF PLAN PROVISIONS – MINNEAPOLIS FIREFIGHTERS' RELIEF ASSOCIATION

| | |
|---|---|
| **Normal retirement benefit** | Monthly benefits are equal to the number of units multiplied by the unit values described herein. Units are based on service, as follows:<br><br>**Service** / **Units**<br>15 — 25.0 units<br>16 — 26.6 units<br>17 — 28.2 units<br>18 — 29.8 units<br>19 — 31.4 units<br>20 — 35.0 units<br>21 — 36.6 units<br>22 — 38.2 units<br>23 — 39.8 units<br>24 — 41.4 units<br>25 or more — 43.0 units<br><br>Members must be at least age 50 with 5 years of service to receive this benefit.<br><br>Members may choose among alternative survivor payment forms which modify the number of units payable to the member and their spouse. A member who is single at the time of retirement and who has at least 25 years of service may choose to receive 43.3 units on the condition of a reduced survivor payment to any future spouse. |
| **Unit values** | **Calendar Year** / **Unit Value**<br>2013 — 100.775<br>2014 — 104.264<br>2015 — 124.031<br>Unit values after 2015 are assumed to increase 1.00% per year through 2050 and 2.50% thereafter. |
| **Disability benefit** | Annual benefit based on 41 units for the disabled member. |
| **Surviving spouse's benefit** | Annual benefit based on 23 units for the surviving spouse of an active or retired member and 22 units for the surviving spouse of a disabled member. Upon retirement, members may choose an alternative form of payment that provides 50%, 75% or 100% of their benefit to their spouse after their death. The units are adjusted if one of these alternate forms is selected. |
| **Surviving children's benefit** | Annual benefit based on 8 units for each surviving child of an active or retired member. Benefits continue to age 18 or if the child is a full-time student, to age 22. The total benefit for surviving children and spouse combined is limited to 43 units. |
| **Contributions** | Member and employer contributions equal to 8.00% of the monthly unit value multiplied by 80 are required for each member. After 25 years of service, member contributions are paid to a separate health insurance account. |
| **Benefit Increases** | Benefit recipients receive a future annual 1.00% post-retirement benefit increase. The annual adjustment will equal 2.50%, any time the fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.50% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.00%. |

# SECTION F

## ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS USED FOR THE DETERMINATION OF TOTAL PENSION LIABILITY AND RELATED VALUES

# ACTUARIAL METHODS USED FOR THE DETERMINATION OF TOTAL PENSION LIABILITY AND RELATED VALUES

**Actuarial Cost Method**

Normal cost and the allocation of benefit values between service rendered before and after the valuation date were 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;

(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 Total Pension Liability.

**Valuation of Future Post-Retirement Benefit Increases**

Benefit recipients receive a future annual 1.00% post-retirement benefit increase. If the funding ratio reaches 90% (based on a 2.50% post-retirement benefit increase assumption) for two consecutive years, the benefit increase will revert to 2.50%. If, after reverting to a 2.50% benefit increase, the funding ratio declines to less than 80% for one year or less than 85% for two consecutive years, the benefit increase will decrease to 1.00%.

To determine an assumption regarding a future change in the post-retirement benefit increase, we performed a projection of liabilities and assets based on the following methods and assumptions:

- Future investment returns of 7.50%
- Liabilities and normal cost based on statutory funding assumptions
  - Discount rate of 8.00%
  - Statutory salary increases (rate of 12.75% at year 1 declining to 4.25% at years 23 and later)
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The postretirement benefit increase rate is assumed to be 1.00% per year until the funding ratio threshold required to pay a 2.50% postretirement benefit increase is reached
- Current statutory contributions (i.e. not including potential contribution increases under the contribution stabilizer statutes) as directed by PERA

Based on these assumptions and methods, the projection indicates that this plan is not expected to attain the funding ratio threshold required to pay a 2.50% postretirement benefit increase. This assumption is reflected in our calculations.

**Asset Valuation Method**

Fair value of assets.

## SUMMARY OF ACTUARIAL ASSUMPTIONS

The following assumptions were used in valuing the liabilities and benefits under the plan. The assumptions are based on the last experience study, dated November 2010, prepared by a former actuary, a review of inflation and investment return assumptions dated September 11, 2014, and a recent asset liability study obtained by the SBI. An experience study for the 2011-2015 period was issued on August 30, 2016. This report recommended many changes to demographic assumptions, expected to be effective at a future date.

The Allowance for Combined Service Annuity was also based on a recommendation by a former actuary. We are unable to judge the reasonableness of this assumption without performing a substantial amount of additional work beyond the scope of the assignment. We note that the LCPR has recently completed a review of this assumption. This review recommended changes to this assumption, expected to be effective at a future date.

| | |
|---|---|
| Investment return | 7.50% per annum. |
| Single Discount Rate | 5.60% per annum. |
| Benefit increases after retirement | 1.00% per annum. |
| Salary increases | Reported salary at valuation date increased according to the rate table, to current fiscal year and annually for each future year. Prior fiscal year salary is annualized for members with less than one year of service earned during the year. |
| Payroll growth | 3.25% per year. |
| Mortality rates | |
| Healthy Pre-retirement | RP-2000 employee generational mortality table projected with scale AA, white collar adjustment, set back two years for males and females. |
| Healthy Post-retirement | RP-2000 annuitant generational mortality table projected with scale AA, white collar adjustment.<br><br>The RP-2000 employee mortality table as published by the Society of Actuaries (SOA) contains mortality rates for ages 15 to 70 and the annuitant mortality table contains mortality rates for ages 50 to 95. We have applied the annuitant mortality table for active members beyond age 70 until the assumed retirement age and the employee mortality table for annuitants younger than age 50. |
| Disabled | RP-2000 healthy annuitant mortality table, white collar adjustment, set forward eight years for males and females. |
| Retirement | Members retiring from active status are assumed to retire according to the age related rates shown in the rate table. Members who have attained the highest assumed retirement age are assumed to retire in one year. |
| Withdrawal | Select and Ultimate rates based on actual experience. Ultimate rates after the third year are shown in rate table. Select rates in the first three years are: |

| Year | Select Withdrawal Rates |
|---|---|
| 1 | 8.00% |
| 2 | 5.00% |
| 3 | 3.50% |

# SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

| | |
|---|---|
| Disability | Age-related rates based on experience; see table of sample rates. All incidences are assumed to be duty-related. |
| Allowance for combined service annuity | Liabilities for former members are increased by 30.00% to account for the effect of some participants having eligibility for a Combined Service Annuity. |
| Administrative expenses | In the valuation year, equal to prior year administrative expenses expressed as a percentage of prior year projected payroll. In each subsequent year, equal to the initial administrative expense percentage applied to payroll for the closed group. |
| Refund of contributions | Account balances accumulate interest until normal retirement date and are discounted back to the valuation date. All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit. |
| Commencement of deferred benefits | Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 55. |
| Percentage married | 85% of male and 65% of female active members are assumed to be married. Actual marital status is used for members in payment status. |
| Age of spouse | Wives are assumed to be three years younger than their husbands for male members, and husbands are assumed to be four years older than their wives for female members. For members in payment status, actual spouse date of birth is used, if provided. |
| Eligible children | Retiring members are assumed to have no dependent children. |
| Form of payment | Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows:<br><br>Males: 10% elect 25% Joint & Survivor option<br>20% elect 50% Joint & Survivor option<br>20% elect 75% Joint & Survivor option<br>35% elect 100% Joint & Survivor option<br>Females: 5% elect 25% Joint & Survivor option<br>15% elect 50% Joint & Survivor option<br>5% elect 75% Joint & Survivor option<br>15% elect 100% Joint & Survivor option<br><br>Remaining married members and unmarried members are assumed to elect the Straight Life option.<br><br>Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity. |
| Eligibility testing | Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur. |
| Decrement operation | Withdrawal decrements do not operate during retirement eligibility. Decrements are assumed to occur mid-fiscal year. |
| Service credit accruals | It is assumed that members accrue one year of service credit per year. |
| Pay Increases | Pay increases are assumed to happen at the beginning of the fiscal year. This is equivalent to assuming that reported earnings are pensionable earnings for the year ending on the valuation date. |

# SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

| | |
|---|---|
| Unknown data for certain members | To prepare this report, GRS has used and relied on participant data supplied by the Fund. Although GRS has reviewed the data in accordance with Actuarial Standards of Practice No. 23, GRS has not verified or audited any of the data or information provided.<br><br>In cases where submitted data was missing or incomplete, the following assumptions were applied:<br><br><u>Data for active members:</u><br>There were 28 members reported with a salary less than $100. We used prior year salary (17 members), if available; otherwise high five salary with a 10% load to account for salary increases (10 members). If neither prior year salary nor high five salary was available, we assumed a value of $35,000 (one member). Note former members of either Minneapolis Police or Minneapolis Fire are excluded from these salary counts as salary is not used to calculate the benefit.<br><br>There were also 108 members reported without a gender. We assumed male gender. There was one member reported without a date of birth. We assumed a date of birth of July 1, 1985.<br><br><u>Data for terminated members:</u><br>We calculated benefits for these members using the reported Average Salary and credited service. If Average Salary was not reported (two members), we assumed a value of $24,000. If credited service was not reported (16 members), we used elapsed time from hire date to termination date (5 members); otherwise we assumed nine years of service (11 members). If termination date was invalid or not reported (10 members), we assumed the termination date was equal to the hire date plus credited service, otherwise the valuation date. If the reported termination date occurs prior to the reported hire date, the two dates were swapped.<br><br>There were 7 members reported without a gender; male was assumed.<br><br>No members were reported without a date of birth.<br><br><u>Data for inactive members:</u><br>There were no members with missing or invalid dates of birth. There were 22 members reported without a gender. We assumed retirees are male and beneficiaries are female. |
| Changes in actuarial assumptions | The assumed post-retirement benefit increase rate was changed from 1.00% per year through 2037 and 2.50% per year thereafter to 1.00% per year for all future years.<br><br>The assumed investment return was changed from 7.90% to 7.50%. The assumed future salary increases, payroll growth, and inflation were decreased by 0.25%. The Single Discount Rate changed from 7.90% to 5.60%. |

## SUMMARY OF ACTUARIAL ASSUMPTIONS (CONTINUED)

| | Rate (%)* | | | | | |
|---|---|---|---|---|---|---|
| | Healthy Post-Retirement Mortality** | | Healthy Pre-Retirement Mortality** | | Disability Mortality | |
| Age | Male | Female | Male | Female | Male | Female |
| 20 | 0.03% | 0.02% | 0.03% | 0.02% | 0.04% | 0.02% |
| 25 | 0.04 | 0.02 | 0.04 | 0.02 | 0.05 | 0.04 |
| 30 | 0.04 | 0.03 | 0.04 | 0.02 | 0.08 | 0.06 |
| 35 | 0.06 | 0.05 | 0.05 | 0.04 | 0.11 | 0.08 |
| 40 | 0.09 | 0.06 | 0.08 | 0.06 | 0.17 | 0.13 |
| 45 | 0.13 | 0.10 | 0.11 | 0.08 | 0.57 | 0.29 |
| 50 | 0.60 | 0.24 | 0.17 | 0.13 | 0.57 | 0.47 |
| 55 | 0.54 | 0.35 | 0.24 | 0.20 | 0.92 | 0.74 |
| 60 | 0.66 | 0.56 | 0.35 | 0.31 | 1.58 | 1.24 |
| 65 | 1.16 | 0.91 | 0.56 | 0.50 | 2.67 | 2.09 |
| 70 | 1.93 | 1.52 | 0.85 | 0.76 | 4.75 | 3.50 |

* *Generally, mortality rates are expected to increase as age increases. These standard mortality rates have been adjusted slightly to prevent decreasing mortality rates. If the rates were not adjusted as described, we would not expect the valuation results to be materially different.*

** *These rates were adjusted for mortality improvements using projection scale AA.*

| | Withdrawal Rates After Third Year | | Disability Retirement | |
|---|---|---|---|---|
| Age | Male | Female | Male | Female |
| 20 | 6.01% | 6.01% | 0.11% | 0.11% |
| 25 | 3.24 | 3.24 | 0.13 | 0.13 |
| 30 | 1.90 | 1.90 | 0.16 | 0.16 |
| 35 | 1.46 | 1.46 | 0.19 | 0.19 |
| 40 | 1.26 | 1.26 | 0.29 | 0.29 |
| 45 | 0.91 | 0.91 | 0.54 | 0.54 |
| 50 | 0.50 | 0.50 | 1.04 | 1.04 |
| 55 | 0.11 | 0.11 | 2.03 | 2.03 |
| 60 | 0.00 | 0.00 | 0.00 | 0.00 |

# SUMMARY OF ACTUARIAL ASSUMPTIONS (CONCLUDED)

| Age | Retirement |
|---|---|
| 50 | 13% |
| 51 | 10 |
| 52 | 10 |
| 53 | 10 |
| 54 | 13 |
| 55 | 30 |
| 56 | 20 |
| 57 | 20 |
| 58 | 20 |
| 59 | 20 |
| 60 | 25 |
| 61 | 25 |
| 62 | 35 |
| 63 | 35 |
| 64 | 35 |
| 65 | 50 |
| 66 | 50 |
| 67 | 50 |
| 68 | 50 |
| 69 | 50 |
| 70+ | 100 |

| Salary Scale | |
|---|---|
| Year | Increase |
| 1 | 12.50% |
| 2 | 10.50% |
| 3 | 8.50% |
| 4 | 7.50% |
| 5 | 6.00% |
| 6 | 5.60% |
| 7 | 5.30% |
| 8 | 5.10% |
| 9 | 4.90% |
| 10 | 4.80% |
| 11 | 4.70% |
| 12 | 4.60% |
| 13 | 4.50% |
| 14 | 4.40% |
| 15 | 4.30% |
| 16 | 4.30% |
| 17 | 4.30% |
| 18 | 4.30% |
| 19 | 4.30% |
| 20 | 4.30% |
| 21 | 4.20% |
| 22 | 4.10% |
| 23+ | 4.00% |

# SECTION G

## CALCULATION OF THE SINGLE DISCOUNT RATE

# CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed long-term rate of return is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a "risk-free" rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.50%, the municipal bond rate is 2.85%; and **the resulting single discount rate is 5.60%**.

Benefit payments projected to occur up through June 30, 2056 were fully funded and benefit payments projected to occur in the year ended June 30, 2057 were partially funded. Assets were projected to be fully depleted by the fiscal year ending June 30, 2057. Benefit payments were discounted using 7.50%, the long-term expected rate of return on pension plan investments, as long as assets were sufficient to fund the benefit payments. Beginning in the July 1, 2056 to June 30, 2057 fiscal year, when benefit payments exceed the Plan's Fiduciary Net Position, benefit payments were discounted at 2.85%, the municipal bond rate. An equivalent single discount rate was determined that produced approximately the same present value of projected benefits when applied to all years of projected benefits as the present value of projected benefits using 7.50% through the point of asset depletion and 2.85% after. For more information on the calculation of the equivalent present value of projected benefits, see pages 41 through 42 of this report.

The tables in this section provide background for the development of the single discount rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

# SINGLE DISCOUNT RATE DEVELOPMENT
## PROJECTION OF CONTRIBUTIONS
## (DOLLARS IN THOUSANDS)

| | Payroll | | | Projected Contributions | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Fiscal Year Ending | Payroll for Current Employees | Payroll for New Employees | Total Employee Payroll | Contributions from Current Employees | Employer Contributions for Current Employees | Contributions on Future Payroll toward current UAL* | Contributions due from Mergers | Additional State Contributions | Total Contributions |
| 2016 | $ 881,222 | $ 0 | $ 881,222 | | | | | | |
| 2017 | 913,658 | 0 | 913,658 | $ 98,675 | $ 148,013 | $ 0 | $ 13,677 | $ 9,000 | $ 269,365 |
| 2018 | 909,303 | 34,049 | 943,352 | 98,205 | 147,307 | 1,655 | 13,677 | 9,000 | 269,844 |
| 2019 | 902,211 | 71,800 | 974,011 | 97,439 | 146,158 | 3,489 | 13,677 | 9,000 | 269,763 |
| 2020 | 891,972 | 113,694 | 1,005,666 | 96,333 | 144,500 | 5,526 | 13,677 | 9,000 | 269,036 |
| 2021 | 878,509 | 159,841 | 1,038,350 | 94,879 | 142,318 | 7,768 | 13,677 | 9,000 | 267,642 |
| 2022 | 862,186 | 209,910 | 1,072,096 | 93,116 | 139,674 | 10,202 | 13,648 | 9,000 | 265,640 |
| 2023 | 843,564 | 263,376 | 1,106,940 | 91,105 | 136,657 | 12,800 | 13,648 | 9,000 | 263,210 |
| 2024 | 822,986 | 319,929 | 1,142,915 | 88,882 | 133,324 | 15,549 | 13,648 | 9,000 | 260,403 |
| 2025 | 800,565 | 379,495 | 1,180,060 | 86,461 | 129,691 | 18,443 | 13,648 | 9,000 | 257,243 |
| 2026 | 776,198 | 442,214 | 1,218,412 | 83,829 | 125,744 | 21,492 | 13,648 | 9,000 | 253,713 |
| 2027 | 750,183 | 507,827 | 1,258,010 | 81,020 | 121,530 | 24,680 | 13,648 | 9,000 | 249,878 |
| 2028 | 722,858 | 576,037 | 1,298,895 | 78,069 | 117,103 | 27,995 | 13,648 | 9,000 | 245,815 |
| 2029 | 694,734 | 646,376 | 1,341,110 | 75,031 | 112,547 | 31,414 | 13,648 | 9,000 | 241,640 |
| 2030 | 665,234 | 719,462 | 1,384,696 | 71,845 | 107,768 | 34,966 | 13,648 | 9,000 | 237,227 |
| 2031 | 633,847 | 795,851 | 1,429,698 | 68,455 | 102,683 | 38,678 | 13,648 | 9,000 | 232,464 |
| 2032 | 600,931 | 875,232 | 1,476,163 | 64,900 | 97,351 | 42,536 | 0 | 9,000 | 213,787 |
| 2033 | 566,342 | 957,797 | 1,524,139 | 61,165 | 91,747 | 46,549 | 0 | 9,000 | 208,461 |
| 2034 | 530,263 | 1,043,410 | 1,573,673 | 57,268 | 85,903 | 50,710 | 0 | 9,000 | 202,881 |
| 2035 | 492,560 | 1,132,258 | 1,624,818 | 53,196 | 79,795 | 55,028 | 0 | 9,000 | 197,019 |
| 2036 | 453,494 | 1,224,130 | 1,677,624 | 48,977 | 73,466 | 59,493 | 0 | 9,000 | 190,936 |
| 2037 | 413,679 | 1,318,468 | 1,732,147 | 44,677 | 67,016 | 64,078 | 0 | 9,000 | 184,771 |
| 2038 | 373,728 | 1,414,714 | 1,788,442 | 40,363 | 60,544 | 68,755 | 0 | 9,000 | 178,662 |
| 2039 | 334,295 | 1,512,271 | 1,846,566 | 36,104 | 54,156 | 73,496 | 0 | 9,000 | 172,756 |
| 2040 | 295,542 | 1,611,038 | 1,906,580 | 31,919 | 47,878 | 78,296 | 0 | 9,000 | 167,093 |
| 2041 | 257,974 | 1,710,569 | 1,968,543 | 27,861 | 41,792 | 83,134 | 0 | 9,000 | 161,787 |
| 2042 | 222,136 | 1,810,385 | 2,032,521 | 23,991 | 35,986 | 87,985 | 0 | 9,000 | 156,962 |
| 2043 | 188,663 | 1,909,915 | 2,098,578 | 20,376 | 30,563 | 92,822 | 0 | 9,000 | 152,761 |
| 2044 | 158,073 | 2,008,709 | 2,166,782 | 17,072 | 25,608 | 97,623 | 0 | 9,000 | 149,303 |
| 2045 | 130,320 | 2,106,882 | 2,237,202 | 14,075 | 21,112 | 102,394 | 0 | 9,000 | 146,581 |
| 2046 | 105,602 | 2,204,309 | 2,309,911 | 11,405 | 17,108 | 107,129 | 0 | 9,000 | 144,642 |
| 2047 | 84,024 | 2,300,959 | 2,384,983 | 9,075 | 13,612 | 111,827 | 0 | 9,000 | 143,514 |
| 2048 | 65,748 | 2,396,747 | 2,462,495 | 7,101 | 10,651 | 116,482 | 0 | 9,000 | 143,234 |
| 2049 | 50,768 | 2,491,758 | 2,542,526 | 5,483 | 8,224 | 121,099 | 0 | 9,000 | 143,806 |
| 2050 | 38,623 | 2,586,536 | 2,625,159 | 4,171 | 6,257 | 125,706 | 0 | 9,000 | 145,134 |
| 2051 | 28,947 | 2,681,529 | 2,710,476 | 3,126 | 4,689 | 130,322 | 0 | 9,000 | 147,137 |
| 2052 | 21,279 | 2,777,288 | 2,798,567 | 2,298 | 3,447 | 134,976 | 0 | 9,000 | 149,721 |
| 2053 | 15,230 | 2,874,290 | 2,889,520 | 1,645 | 2,467 | 139,690 | 0 | 9,000 | 152,802 |
| 2054 | 10,555 | 2,972,874 | 2,983,429 | 1,140 | 1,710 | 144,482 | 0 | 9,000 | 156,332 |
| 2055 | 7,031 | 3,073,360 | 3,080,391 | 759 | 1,139 | 149,365 | 0 | 9,000 | 160,263 |
| 2056 | 4,489 | 3,176,015 | 3,180,504 | 485 | 727 | 154,354 | 0 | 9,000 | 164,566 |
| 2057 | 2,732 | 3,281,138 | 3,283,870 | 295 | 443 | 159,463 | 0 | 9,000 | 169,201 |
| 2058 | 1,579 | 3,389,017 | 3,390,596 | 171 | 256 | 164,706 | 0 | 9,000 | 174,133 |
| 2059 | 872 | 3,499,918 | 3,500,790 | 94 | 141 | 170,096 | 0 | 9,000 | 179,331 |
| 2060 | 456 | 3,614,110 | 3,614,566 | 49 | 74 | 175,646 | 0 | 9,000 | 184,769 |
| 2061 | 225 | 3,731,814 | 3,732,039 | 24 | 36 | 181,366 | 0 | 9,000 | 190,426 |
| 2062 | 105 | 3,853,225 | 3,853,330 | 11 | 17 | 187,267 | 0 | 9,000 | 196,295 |
| 2063 | 45 | 3,978,519 | 3,978,564 | 5 | 7 | 193,356 | 0 | 9,000 | 202,368 |
| 2064 | 19 | 4,107,848 | 4,107,867 | 2 | 3 | 199,641 | 0 | 9,000 | 208,646 |
| 2065 | 7 | 4,241,366 | 4,241,373 | 1 | 1 | 206,130 | 0 | 9,000 | 215,132 |
| 2066 | 2 | 4,379,215 | 4,379,217 | 0 | - | 212,830 | 0 | 9,000 | 221,830 |

**Contributions related to future employees in excess of normal cost and expenses of 22.14% of pay.*

# SINGLE DISCOUNT RATE DEVELOPMENT
## PROJECTION OF CONTRIBUTIONS (CONCLUDED)
## (DOLLARS IN THOUSANDS)

| | Payroll | | | Projected Contributions | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Fiscal Year Ending | Payroll for Current Employees | Payroll for New Employees | Total Employee Payroll | Contributions from Current Employees | Employer Contributions for Current Employees | Contributions on Future Payroll toward current UAL* | Contributions due from Mergers | Additional State Contributions | Total Contributions |
| 2067 | $ 1 | $ 4,521,541 | $ 4,521,542 | $ 0 | $ 0 | $ 219,747 | $ 0 | $ 9,000 | $ 228,747 |
| 2068 | 1 | 4,668,491 | 4,668,492 | 0 | 0 | 226,889 | 0 | 9,000 | 235,889 |
| 2069 | 0 | 4,820,218 | 4,820,218 | 0 | 0 | 234,263 | 0 | 9,000 | 243,263 |
| 2070 | 0 | 4,976,875 | 4,976,875 | 0 | 0 | 241,876 | 0 | 9,000 | 250,876 |
| 2071 | 0 | 5,138,624 | 5,138,624 | 0 | 0 | 249,737 | 0 | 9,000 | 258,737 |
| 2072 | 0 | 5,305,629 | 5,305,629 | 0 | 0 | 257,854 | 0 | 9,000 | 266,854 |
| 2073 | 0 | 5,478,062 | 5,478,062 | 0 | 0 | 266,234 | 0 | 9,000 | 275,234 |
| 2074 | 0 | 5,656,099 | 5,656,099 | 0 | 0 | 274,886 | 0 | 9,000 | 283,886 |
| 2075 | 0 | 5,839,922 | 5,839,922 | 0 | 0 | 283,820 | 0 | 9,000 | 292,820 |
| 2076 | 0 | 6,029,719 | 6,029,719 | 0 | 0 | 293,044 | 0 | 9,000 | 302,044 |
| 2077 | 0 | 6,225,685 | 6,225,685 | 0 | 0 | 302,568 | 0 | 9,000 | 311,568 |
| 2078 | 0 | 6,428,020 | 6,428,020 | 0 | 0 | 312,402 | 0 | 9,000 | 321,402 |
| 2079 | 0 | 6,636,931 | 6,636,931 | 0 | 0 | 322,555 | 0 | 9,000 | 331,555 |
| 2080 | 0 | 6,852,631 | 6,852,631 | 0 | 0 | 333,038 | 0 | 9,000 | 342,038 |
| 2081 | 0 | 7,075,341 | 7,075,341 | 0 | 0 | 343,862 | 0 | 9,000 | 352,862 |
| 2082 | 0 | 7,305,290 | 7,305,290 | 0 | 0 | 355,037 | 0 | 9,000 | 364,037 |
| 2083 | 0 | 7,542,712 | 7,542,712 | 0 | 0 | 366,576 | 0 | 9,000 | 375,576 |
| 2084 | 0 | 7,787,850 | 7,787,850 | 0 | 0 | 378,490 | 0 | 9,000 | 387,490 |
| 2085 | 0 | 8,040,955 | 8,040,955 | 0 | 0 | 390,790 | 0 | 9,000 | 399,790 |
| 2086 | 0 | 8,302,286 | 8,302,286 | 0 | 0 | 403,491 | 0 | 9,000 | 412,491 |
| 2087 | 0 | 8,572,111 | 8,572,111 | 0 | 0 | 416,605 | 0 | 9,000 | 425,605 |
| 2088 | 0 | 8,850,704 | 8,850,704 | 0 | 0 | 430,144 | 0 | 9,000 | 439,144 |
| 2089 | 0 | 9,138,352 | 9,138,352 | 0 | 0 | 444,124 | 0 | 9,000 | 453,124 |
| 2090 | 0 | 9,435,348 | 9,435,348 | 0 | 0 | 458,558 | 0 | 9,000 | 467,558 |
| 2091 | 0 | 9,741,997 | 9,741,997 | 0 | 0 | 473,461 | 0 | 9,000 | 482,461 |
| 2092 | 0 | 10,058,612 | 10,058,612 | 0 | 0 | 488,849 | 0 | 9,000 | 497,849 |
| 2093 | 0 | 10,385,517 | 10,385,517 | 0 | 0 | 504,736 | 0 | 9,000 | 513,736 |
| 2094 | 0 | 10,723,046 | 10,723,046 | 0 | 0 | 521,140 | 0 | 9,000 | 530,140 |
| 2095 | 0 | 11,071,545 | 11,071,545 | 0 | 0 | 538,077 | 0 | 9,000 | 547,077 |
| 2096 | 0 | 11,431,371 | 11,431,371 | 0 | 0 | 555,565 | 0 | 9,000 | 564,565 |
| 2097 | 0 | 11,802,890 | 11,802,890 | 0 | 0 | 573,620 | 0 | 9,000 | 582,620 |
| 2098 | 0 | 12,186,484 | 12,186,484 | 0 | 0 | 592,263 | 0 | 9,000 | 601,263 |
| 2099 | 0 | 12,582,545 | 12,582,545 | 0 | 0 | 611,512 | 0 | 9,000 | 620,512 |
| 2100 | 0 | 12,991,478 | 12,991,478 | 0 | 0 | 631,386 | 0 | 9,000 | 640,386 |
| 2101 | 0 | 13,413,701 | 13,413,701 | 0 | 0 | 651,906 | 0 | 9,000 | 660,906 |
| 2102 | 0 | 13,849,646 | 13,849,646 | 0 | 0 | 673,093 | 0 | 9,000 | 682,093 |
| 2103 | 0 | 14,299,759 | 14,299,759 | 0 | 0 | 694,968 | 0 | 9,000 | 703,968 |
| 2104 | 0 | 14,764,502 | 14,764,502 | 0 | 0 | 717,555 | 0 | 9,000 | 726,555 |
| 2105 | 0 | 15,244,348 | 15,244,348 | 0 | 0 | 740,875 | 0 | 9,000 | 749,875 |
| 2106 | 0 | 15,739,789 | 15,739,789 | 0 | 0 | 764,954 | 0 | 9,000 | 773,954 |
| 2107 | 0 | 16,251,332 | 16,251,332 | 0 | 0 | 789,815 | 0 | 9,000 | 798,815 |
| 2108 | 0 | 16,779,501 | 16,779,501 | 0 | 0 | 815,484 | 0 | 9,000 | 824,484 |
| 2109 | 0 | 17,324,834 | 17,324,834 | 0 | 0 | 841,987 | 0 | 9,000 | 850,987 |
| 2110 | 0 | 17,887,891 | 17,887,891 | 0 | 0 | 869,352 | 0 | 9,000 | 878,352 |
| 2111 | 0 | 18,469,248 | 18,469,248 | 0 | 0 | 897,605 | 0 | 9,000 | 906,605 |
| 2112 | 0 | 19,069,499 | 19,069,499 | 0 | 0 | 926,778 | 0 | 9,000 | 935,778 |
| 2113 | 0 | 19,689,257 | 19,689,257 | 0 | 0 | 956,898 | 0 | 9,000 | 965,898 |
| 2114 | 0 | 20,329,158 | 20,329,158 | 0 | 0 | 987,997 | 0 | 9,000 | 996,997 |
| 2115 | 0 | 20,989,856 | 20,989,856 | 0 | 0 | 1,020,107 | 0 | 9,000 | 1,029,107 |
| 2116 | 0 | 21,672,026 | 21,672,026 | 0 | 0 | 1,053,260 | 0 | 9,000 | 1,062,260 |

*Contributions related to future employees in excess of normal cost and expenses of 22.14% of pay.*

# SINGLE DISCOUNT RATE DEVELOPMENT
## PROJECTION OF PLAN FIDUCIARY NET POSITION
## (DOLLARS IN THOUSANDS)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Total Contributions | Projected Benefit Payments | Projected Administrative Expenses | Projected Investment Earnings at 7.50% | Projected Ending Plan Net Position |
|---|---|---|---|---|---|---|
| | (a) | (b) | (c) | (d) | (e) | (f)=(a)+(b)-(c)-(d)+(e) |
| 2017 | $ 7,098,090 | $ 269,365 | $ 520,556 | $ 914 | $ 523,074 | $ 7,369,059 |
| 2018 | 7,369,059 | 269,844 | 538,519 | 909 | 542,753 | 7,642,228 |
| 2019 | 7,642,228 | 269,764 | 556,740 | 902 | 562,567 | 7,916,917 |
| 2020 | 7,916,917 | 269,035 | 575,855 | 892 | 582,438 | 8,191,643 |
| 2021 | 8,191,643 | 267,643 | 596,104 | 879 | 602,246 | 8,464,549 |
| 2022 | 8,464,549 | 265,640 | 618,678 | 862 | 621,810 | 8,732,459 |
| 2023 | 8,732,459 | 263,210 | 642,341 | 844 | 640,943 | 8,993,427 |
| 2024 | 8,993,427 | 260,402 | 667,050 | 823 | 659,503 | 9,245,459 |
| 2025 | 9,245,459 | 257,244 | 692,880 | 801 | 677,339 | 9,486,361 |
| 2026 | 9,486,361 | 253,713 | 719,954 | 776 | 694,280 | 9,713,624 |
| 2027 | 9,713,624 | 249,878 | 748,139 | 750 | 710,147 | 9,924,760 |
| 2028 | 9,924,760 | 245,815 | 776,093 | 723 | 724,804 | 10,118,563 |
| 2029 | 10,118,563 | 241,640 | 804,019 | 695 | 738,159 | 10,293,648 |
| 2030 | 10,293,648 | 237,227 | 832,197 | 665 | 750,091 | 10,448,104 |
| 2031 | 10,448,104 | 232,465 | 860,880 | 634 | 760,445 | 10,579,500 |
| 2032 | 10,579,500 | 213,788 | 889,871 | 601 | 768,545 | 10,671,361 |
| 2033 | 10,671,361 | 208,461 | 919,314 | 566 | 774,156 | 10,734,098 |
| 2034 | 10,734,098 | 202,881 | 948,902 | 530 | 777,568 | 10,765,115 |
| 2035 | 10,765,115 | 197,019 | 978,969 | 493 | 778,572 | 10,761,244 |
| 2036 | 10,761,244 | 190,936 | 1,009,499 | 453 | 776,935 | 10,719,163 |
| 2037 | 10,719,163 | 184,771 | 1,039,695 | 414 | 772,442 | 10,636,267 |
| 2038 | 10,636,267 | 178,662 | 1,069,361 | 374 | 764,909 | 10,510,103 |
| 2039 | 10,510,103 | 172,756 | 1,097,976 | 334 | 754,177 | 10,338,726 |
| 2040 | 10,338,726 | 167,093 | 1,125,448 | 296 | 740,105 | 10,120,180 |
| 2041 | 10,120,180 | 161,787 | 1,150,941 | 258 | 722,581 | 9,853,349 |
| 2042 | 9,853,349 | 156,961 | 1,174,219 | 222 | 701,535 | 9,537,404 |
| 2043 | 9,537,404 | 152,761 | 1,194,510 | 189 | 676,939 | 9,172,405 |
| 2044 | 9,172,405 | 149,303 | 1,211,604 | 158 | 648,808 | 8,758,754 |
| 2045 | 8,758,754 | 146,581 | 1,225,721 | 130 | 617,165 | 8,296,649 |
| 2046 | 8,296,649 | 144,642 | 1,236,505 | 106 | 582,040 | 7,786,720 |
| 2047 | 7,786,720 | 143,513 | 1,243,625 | 84 | 543,492 | 7,230,016 |
| 2048 | 7,230,016 | 143,234 | 1,246,543 | 66 | 501,623 | 6,628,264 |
| 2049 | 6,628,264 | 143,807 | 1,245,025 | 51 | 456,569 | 5,983,564 |
| 2050 | 5,983,564 | 145,134 | 1,239,509 | 39 | 408,469 | 5,297,619 |
| 2051 | 5,297,619 | 147,138 | 1,230,259 | 29 | 357,437 | 4,571,906 |
| 2052 | 4,571,906 | 149,722 | 1,217,786 | 21 | 303,564 | 3,807,385 |
| 2053 | 3,807,385 | 152,803 | 1,202,506 | 15 | 246,901 | 3,004,568 |
| 2054 | 3,004,568 | 156,332 | 1,184,608 | 11 | 187,479 | 2,163,760 |
| 2055 | 2,163,760 | 160,264 | 1,164,275 | 7 | 125,312 | 1,285,054 |
| 2056 | 1,285,054 | 164,566 | 1,141,610 | 4 | 60,402 | 368,408 |
| 2057 | 368,408 | 169,201 | 1,116,761 | 3 | - | - |
| 2058 | - | 174,133 | 1,089,914 | 2 | - | - |
| 2059 | - | 179,331 | 1,061,224 | 1 | - | - |
| 2060 | - | 184,769 | 1,030,859 | 0 | - | - |
| 2061 | - | 190,427 | 998,963 | 0 | - | - |
| 2062 | - | 196,295 | 965,663 | 0 | - | - |
| 2063 | - | 202,368 | 931,068 | 0 | - | - |
| 2064 | - | 208,646 | 895,290 | 0 | - | - |
| 2065 | - | 215,132 | 858,441 | 0 | - | - |
| 2066 | - | 221,831 | 820,631 | 0 | - | - |

# SINGLE DISCOUNT RATE DEVELOPMENT
## PROJECTION OF PLAN FIDUCIARY NET POSITION (CONCLUDED)
## (DOLLARS IN THOUSANDS)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Total Contributions | Projected Benefit Payments | Projected Administrative Expenses | Projected Investment Earnings at 7.50% | Projected Ending Plan Net Position |
|---|---|---|---|---|---|---|
| | (a) | (b) | (c) | (d) | (e) | (f)=(a)+(b)-(c)-(d)+(e) |
| 2067 | $ - | $ 228,747 | $ 781,974 | $ 0 | $ - | $ - |
| 2068 | - | 235,889 | 742,592 | 0 | - | - |
| 2069 | - | 243,263 | 702,609 | 0 | - | - |
| 2070 | - | 250,876 | 662,160 | 0 | - | - |
| 2071 | - | 258,737 | 621,378 | 0 | - | - |
| 2072 | - | 266,854 | 580,407 | 0 | - | - |
| 2073 | - | 275,234 | 539,406 | 0 | - | - |
| 2074 | - | 283,886 | 498,565 | 0 | - | - |
| 2075 | - | 292,820 | 458,098 | 0 | - | - |
| 2076 | - | 302,044 | 418,242 | 0 | - | - |
| 2077 | - | 311,568 | 379,242 | 0 | - | - |
| 2078 | - | 321,402 | 341,357 | 0 | - | - |
| 2079 | - | 331,555 | 304,849 | 0 | - | - |
| 2080 | - | 342,038 | 269,963 | 0 | - | - |
| 2081 | - | 352,862 | 236,932 | 0 | - | - |
| 2082 | - | 364,037 | 205,976 | 0 | - | - |
| 2083 | - | 375,576 | 177,276 | 0 | - | - |
| 2084 | - | 387,490 | 150,989 | 0 | - | - |
| 2085 | - | 399,790 | 127,214 | 0 | - | - |
| 2086 | - | 412,491 | 105,987 | 0 | - | - |
| 2087 | - | 425,605 | 87,286 | 0 | - | - |
| 2088 | - | 439,144 | 71,034 | 0 | - | - |
| 2089 | - | 453,124 | 57,109 | 0 | - | - |
| 2090 | - | 467,558 | 45,352 | 0 | - | - |
| 2091 | - | 482,461 | 35,567 | 0 | - | - |
| 2092 | - | 497,849 | 27,546 | 0 | - | - |
| 2093 | - | 513,736 | 21,071 | 0 | - | - |
| 2094 | - | 530,140 | 15,925 | 0 | - | - |
| 2095 | - | 547,077 | 11,896 | 0 | - | - |
| 2096 | - | 564,565 | 8,786 | 0 | - | - |
| 2097 | - | 582,620 | 6,414 | 0 | - | - |
| 2098 | - | 601,263 | 4,629 | 0 | - | - |
| 2099 | - | 620,512 | 3,300 | 0 | - | - |
| 2100 | - | 640,386 | 2,324 | 0 | - | - |
| 2101 | - | 660,906 | 1,615 | 0 | - | - |
| 2102 | - | 682,093 | 1,107 | 0 | - | - |
| 2103 | - | 703,968 | 748 | 0 | - | - |
| 2104 | - | 726,555 | 498 | 0 | - | - |
| 2105 | - | 749,875 | 327 | 0 | - | - |
| 2106 | - | 773,954 | 211 | 0 | - | - |
| 2107 | - | 798,815 | 135 | 0 | - | - |
| 2108 | - | 824,484 | 85 | 0 | - | - |
| 2109 | - | 850,987 | 52 | 0 | - | - |
| 2110 | - | 878,352 | 32 | 0 | - | - |
| 2111 | - | 906,605 | 19 | 0 | - | - |
| 2112 | - | 935,778 | 11 | 0 | - | - |
| 2113 | - | 965,898 | 6 | 0 | - | - |
| 2114 | - | 996,997 | 4 | 0 | - | - |
| 2115 | - | 1,029,107 | 2 | 0 | - | - |
| 2116 | - | 1,062,260 | 1 | 0 | - | - |

# SINGLE DISCOUNT RATE DEVELOPMENT
## PRESENT VALUES OF PROJECTED BENEFITS
## (DOLLARS IN THOUSANDS)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Benefit Payments | Funded Portion of Benefit Payments | Unfunded Portion of Benefit Payments | Present Value of Funded Benefit Payments using Expected Return Rate (v) | Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf) | Present Value of Benefit Payments using Single Discount Rate (sdr) |
|---|---|---|---|---|---|---|---|
| (a) | (b) | (c) | (d) | (e) | (f)=(d)*v^((a)-.5) | (g)=(e)*vf ^((a)-.5) | (h)=((c)/(1+sdr)^(a-.5) |
| 2017 | $ 7,098,090 | $ 520,556 | $ 520,556 | $ 0 | $ 502,069 | $ 0 | $ 506,573 |
| 2018 | 7,369,059 | 538,519 | 538,519 | 0 | 483,157 | 0 | 496,278 |
| 2019 | 7,642,227 | 556,740 | 556,740 | 0 | 464,656 | 0 | 485,875 |
| 2020 | 7,916,915 | 575,855 | 575,855 | 0 | 447,078 | 0 | 475,921 |
| 2021 | 8,191,642 | 596,104 | 596,104 | 0 | 430,511 | 0 | 466,544 |
| 2022 | 8,464,548 | 618,678 | 618,678 | 0 | 415,641 | 0 | 458,547 |
| 2023 | 8,732,457 | 642,341 | 642,341 | 0 | 401,431 | 0 | 450,852 |
| 2024 | 8,993,426 | 667,050 | 667,050 | 0 | 387,789 | 0 | 443,380 |
| 2025 | 9,245,458 | 692,880 | 692,880 | 0 | 374,702 | 0 | 436,139 |
| 2026 | 9,486,360 | 719,954 | 719,954 | 0 | 362,180 | 0 | 429,161 |
| 2027 | 9,713,623 | 748,139 | 748,139 | 0 | 350,101 | 0 | 422,325 |
| 2028 | 9,924,758 | 776,093 | 776,093 | 0 | 337,844 | 0 | 414,885 |
| 2029 | 10,118,562 | 804,019 | 804,019 | 0 | 325,582 | 0 | 407,032 |
| 2030 | 10,293,647 | 832,197 | 832,197 | 0 | 313,482 | 0 | 398,968 |
| 2031 | 10,448,102 | 860,880 | 860,880 | 0 | 301,662 | 0 | 390,844 |
| 2032 | 10,579,498 | 889,871 | 889,871 | 0 | 290,065 | 0 | 382,593 |
| 2033 | 10,671,359 | 919,314 | 919,314 | 0 | 278,756 | 0 | 374,302 |
| 2034 | 10,734,096 | 948,902 | 948,902 | 0 | 267,654 | 0 | 365,872 |
| 2035 | 10,765,112 | 978,969 | 978,969 | 0 | 256,869 | 0 | 357,459 |
| 2036 | 10,761,241 | 1,009,499 | 1,009,499 | 0 | 246,400 | 0 | 349,069 |
| 2037 | 10,719,161 | 1,039,695 | 1,039,695 | 0 | 236,065 | 0 | 340,456 |
| 2038 | 10,636,265 | 1,069,361 | 1,069,361 | 0 | 225,862 | 0 | 331,611 |
| 2039 | 10,510,100 | 1,097,976 | 1,097,976 | 0 | 215,726 | 0 | 322,438 |
| 2040 | 10,338,722 | 1,125,448 | 1,125,448 | 0 | 205,696 | 0 | 312,988 |
| 2041 | 10,120,176 | 1,150,941 | 1,150,941 | 0 | 195,680 | 0 | 303,113 |
| 2042 | 9,853,345 | 1,174,219 | 1,174,219 | 0 | 185,709 | 0 | 292,853 |
| 2043 | 9,537,400 | 1,194,510 | 1,194,510 | 0 | 175,738 | 0 | 282,123 |
| 2044 | 9,172,402 | 1,211,604 | 1,211,604 | 0 | 165,817 | 0 | 270,994 |
| 2045 | 8,758,751 | 1,225,721 | 1,225,721 | 0 | 156,045 | 0 | 259,620 |
| 2046 | 8,296,646 | 1,236,505 | 1,236,505 | 0 | 146,435 | 0 | 248,023 |
| 2047 | 7,786,717 | 1,243,625 | 1,243,625 | 0 | 137,003 | 0 | 236,230 |
| 2048 | 7,230,014 | 1,246,543 | 1,246,543 | 0 | 127,744 | 0 | 224,234 |
| 2049 | 6,628,262 | 1,245,025 | 1,245,025 | 0 | 118,687 | 0 | 212,091 |
| 2050 | 5,983,561 | 1,239,509 | 1,239,509 | 0 | 109,917 | 0 | 199,959 |
| 2051 | 5,297,616 | 1,230,259 | 1,230,259 | 0 | 101,486 | 0 | 187,948 |
| 2052 | 4,571,903 | 1,217,786 | 1,217,786 | 0 | 93,448 | 0 | 176,182 |
| 2053 | 3,807,381 | 1,202,506 | 1,202,506 | 0 | 85,838 | 0 | 164,750 |
| 2054 | 3,004,563 | 1,184,608 | 1,184,608 | 0 | 78,661 | 0 | 153,696 |
| 2055 | 2,163,755 | 1,164,275 | 1,164,275 | 0 | 71,917 | 0 | 143,052 |
| 2056 | 1,285,048 | 1,141,610 | 1,141,610 | 0 | 65,597 | 0 | 132,832 |
| 2057 | 368,401 | 1,116,761 | 368,401 | 748,360 | 19,691 | 239,793 | 123,054 |
| 2058 | - | 1,089,914 | - | 1,089,914 | - | 339,558 | 113,730 |
| 2059 | - | 1,061,224 | - | 1,061,224 | - | 321,458 | 104,867 |
| 2060 | - | 1,030,859 | - | 1,030,859 | - | 303,607 | 96,468 |
| 2061 | - | 998,963 | - | 998,963 | - | 286,061 | 88,528 |
| 2062 | - | 965,663 | - | 965,663 | - | 268,862 | 81,041 |
| 2063 | - | 931,068 | - | 931,068 | - | 252,047 | 73,997 |
| 2064 | - | 895,290 | - | 895,290 | - | 235,646 | 67,382 |
| 2065 | - | 858,441 | - | 858,441 | - | 219,686 | 61,184 |
| 2066 | - | 820,631 | - | 820,631 | - | 204,190 | 55,389 |

# SINGLE DISCOUNT RATE DEVELOPMENT
## PRESENT VALUES OF PROJECTED BENEFITS (CONCLUDED)
## (DOLLARS IN THOUSANDS)

| Fiscal Year Ending | Projected Beginning Plan Net Position | Projected Benefit Payments | Funded Portion of Benefit Payments | Unfunded Portion of Benefit Payments | Present Value of Funded Benefit Payments using Expected Return Rate (v) | Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf) | Present Value of Benefit Payments using Single Discount Rate (sdr) |
|---|---|---|---|---|---|---|---|
| (a) | (b) | (c) | (d) | (e) | (f)=(d)*v^((a)-.5) | (g)=(e)*vf ^((a)-.5) | (h)=((c)/(1+sdr)^(a-.5) |
| 2067 | $ - | $ 781,974 | $ - | $ 781,974 | $ 0 | $ 189,180 | $ 49,983 |
| 2068 | - | 742,592 | - | 742,592 | 0 | 174,674 | 44,950 |
| 2069 | - | 702,609 | - | 702,609 | 0 | 160,690 | 40,275 |
| 2070 | - | 662,160 | - | 662,160 | 0 | 147,242 | 35,945 |
| 2071 | - | 621,378 | - | 621,378 | 0 | 134,345 | 31,943 |
| 2072 | - | 580,407 | - | 580,407 | 0 | 122,010 | 28,256 |
| 2073 | - | 539,406 | - | 539,406 | 0 | 110,249 | 24,868 |
| 2074 | - | 498,565 | - | 498,565 | 0 | 99,077 | 21,767 |
| 2075 | - | 458,098 | - | 458,098 | 0 | 88,513 | 18,940 |
| 2076 | - | 418,242 | - | 418,242 | 0 | 78,573 | 16,376 |
| 2077 | - | 379,242 | - | 379,242 | 0 | 69,272 | 14,062 |
| 2078 | - | 341,357 | - | 341,357 | 0 | 60,624 | 11,986 |
| 2079 | - | 304,849 | - | 304,849 | 0 | 52,640 | 10,137 |
| 2080 | - | 269,963 | - | 269,963 | 0 | 45,324 | 8,501 |
| 2081 | - | 236,932 | - | 236,932 | 0 | 38,677 | 7,065 |
| 2082 | - | 205,976 | - | 205,976 | 0 | 32,691 | 5,817 |
| 2083 | - | 177,276 | - | 177,276 | 0 | 27,357 | 4,741 |
| 2084 | - | 150,989 | - | 150,989 | 0 | 22,655 | 3,824 |
| 2085 | - | 127,214 | - | 127,214 | 0 | 18,558 | 3,051 |
| 2086 | - | 105,987 | - | 105,987 | 0 | 15,033 | 2,407 |
| 2087 | - | 87,286 | - | 87,286 | 0 | 12,038 | 1,877 |
| 2088 | - | 71,034 | - | 71,034 | 0 | 9,525 | 1,447 |
| 2089 | - | 57,109 | - | 57,109 | 0 | 7,445 | 1,102 |
| 2090 | - | 45,352 | - | 45,352 | 0 | 5,749 | 828 |
| 2091 | - | 35,567 | - | 35,567 | 0 | 4,384 | 615 |
| 2092 | - | 27,546 | - | 27,546 | 0 | 3,301 | 451 |
| 2093 | - | 21,071 | - | 21,071 | 0 | 2,455 | 327 |
| 2094 | - | 15,925 | - | 15,925 | 0 | 1,804 | 234 |
| 2095 | - | 11,896 | - | 11,896 | 0 | 1,310 | 166 |
| 2096 | - | 8,786 | - | 8,786 | 0 | 941 | 116 |
| 2097 | - | 6,414 | - | 6,414 | 0 | 668 | 80 |
| 2098 | - | 4,629 | - | 4,629 | 0 | 469 | 55 |
| 2099 | - | 3,300 | - | 3,300 | 0 | 325 | 37 |
| 2100 | - | 2,324 | - | 2,324 | 0 | 222 | 25 |
| 2101 | - | 1,615 | - | 1,615 | 0 | 150 | 16 |
| 2102 | - | 1,107 | - | 1,107 | 0 | 100 | 11 |
| 2103 | - | 748 | - | 748 | 0 | 66 | 7 |
| 2104 | - | 498 | - | 498 | 0 | 43 | 4 |
| 2105 | - | 327 | - | 327 | 0 | 27 | 3 |
| 2106 | - | 211 | - | 211 | 0 | 17 | 2 |
| 2107 | - | 135 | - | 135 | 0 | 11 | 1 |
| 2108 | - | 85 | - | 85 | 0 | 6 | 1 |
| 2109 | - | 52 | - | 52 | 0 | 4 | 0 |
| 2110 | - | 32 | - | 32 | 0 | 2 | 0 |
| 2111 | - | 19 | - | 19 | 0 | 1 | 0 |
| 2112 | - | 11 | - | 11 | 0 | 1 | 0 |
| 2113 | - | 6 | - | 6 | 0 | 0 | 0 |
| 2114 | - | 4 | - | 4 | 0 | 0 | 0 |
| 2115 | - | 2 | - | 2 | 0 | 0 | 0 |
| 2116 | - | 1 | - | 1 | 0 | 0 | 0 |
| | | | | **Totals** | $ 10,156,390 | $ 4,409,358 | $ 14,565,748 |

# SECTION H

## GLOSSARY OF TERMS

# GLOSSARY OF TERMS

***Actuarial Accrued Liability (AAL)***
The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability".

***Actuarial Assumptions***
These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.

***Accrued Service***
Service credited under the system which was rendered before the date of the actuarial valuation.

***Actuarial Equivalent***
A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.

***Actuarial Cost Method***
A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.

***Actuarial Gain (Loss)***
The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.

***Actuarial Present Value (APV)***
The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future benefit payments at predetermined rates of interest to reflect the expected effects of the time value (present value) of money and the probabilities of payment.

***Actuarial Valuation***
The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.

***Actuarial Valuation Date***
The date as of which an actuarial valuation is performed.

***Actuarially Determined Contribution (ADC)***
A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

# GLOSSARY OF TERMS

***Amortization Payment*** The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

***Amortization Method*** The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

***Cost-of-Living Adjustments*** Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

***Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)*** A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

***Covered-Employee Payroll*** The payroll of covered employees, which is typically only the pensionable pay (meets the statutory salary definition) and does not include pay above any pay cap.

***Deferred Inflows and Outflows of Resources*** The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

***Discount Rate or Single Discount Rate*** For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

***Entry Age Actuarial Cost Method or Entry Age Normal (EAN)*** The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

# GLOSSARY OF TERMS

| | |
|---|---|
| ***GASB*** | The Governmental Accounting Standards Board is an organization that exists with authority to promulgate accounting standards for state and local governmental entities. |
| ***Fiduciary Net Position*** | The fiduciary net position is the value of the net assets of the trust restricted for pension benefits. |
| ***Long-Term Expected Rate of Return*** | The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio. |
| ***Money-Weighted Rate of Return*** | The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense. |
| ***Multiple-Employer Defined Benefit Pension Plan*** | A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer. |
| ***Municipal Bond Rate*** | The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted. |
| ***Net Pension Liability (NPL)*** | The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan. |
| ***Non-Employer Contribution Entities*** | Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting Statements No. 67 and No. 68 plan members are not considered non-employer contribution entities. |
| ***Normal Cost*** | The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method. |
| ***Other Postemployment Benefits (OPEB)*** | All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits. |
| ***Real Rate of Return*** | The real rate of return is the rate of return on an investment after adjustment to eliminate inflation. |
| ***Service Cost*** | The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year. |

# GLOSSARY OF TERMS

***Total Pension Expense*** The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Changes in Benefit Terms
4. Employee Contributions
5. Projected Earnings on Plan Investments
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to the difference between expected and actual in measurement of the Total Pension Liability
9. Recognition of Outflows (Inflow) of Resources due to Assumption Changes
10. Recognition of Outflow (Inflow) of Resources due to the difference between projected and actual earnings on pension plan investments

***Total Pension Liability (TPL)*** The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

***Unfunded Actuarial Accrued Liability (UAAL)*** The UAAL is the difference between actuarial accrued liability and valuation assets.

***Valuation Assets*** The valuation assets are the plan fiduciary net position used in determining the net position liability of the plan. For purposes of the GASB Statement No. 67, the asset valuation method is equal to the market value of assets.