

**Public Employees'  
Retirement Fund of  
Minnesota**

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*Actuarial Valuation Report as of  
July 1, 1998*

*March 1999*

**William M. Mercer, Incorporated  
8500 Normandale Lake Blvd., Suite 2250  
Minneapolis, MN 55437**

① 612-897-8800

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## Highlights

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This report has been prepared by William M. Mercer, Incorporated for the Public Employees Retirement Association of Minnesota (PERA) to:

- present the results of a valuation of the Public Employees Retirement Fund as of July 1, 1998;
- review experience under the Plan for the year ended June 30, 1998; and
- provide the funded status as of June 30, 1998, and the required contribution and sufficiency (deficiency) as of July 1, 1998.

## Summary of Principal Valuation Results

A summary of principal valuation results from the current valuation follows.

|                                                              | Actuarial Valuation as<br>of July 1, 1998<br>(dollars in thousands) |
|--------------------------------------------------------------|---------------------------------------------------------------------|
| <b>Contributions</b>                                         |                                                                     |
| Statutory Contributions<br><i>Percentage of Compensation</i> | 10.03%                                                              |
| Required Contributions<br><i>Percentage of Compensation</i>  | 9.91%                                                               |
| Contribution Sufficiency (Deficiency)                        | .12%                                                                |

|                                            |              |
|--------------------------------------------|--------------|
| <b>Assets and Actuarial Present Values</b> |              |
| Market Value of Assets                     | \$ 8,025,061 |
| Actuarial Value of Assets                  | \$ 7,636,668 |
| Unfunded Actuarial Accrued Liability       | \$ 1,188,133 |
| Actuarial Accrued Liability                | \$ 8,824,801 |
| Accrued Liability Funding Ratio            | \$ 86.54%    |
| Normal Cost                                | 256,810      |
| <i>Percentage of Compensation</i>          | \$ 7.58%     |

|                                     |         |
|-------------------------------------|---------|
| <b>Summary of Data</b>              |         |
| Number of Participants in Valuation |         |
| Active Participants                 | 136,166 |
| Participants with Deferred Benefits | 12,238  |
| Terminated Other Non-Vested         | 15,847  |
| Participants Receiving Benefits     | 43,163  |
| <b>Total</b>                        | 207,414 |

|                                                        |              |
|--------------------------------------------------------|--------------|
| <b>Active Participant Statistics</b>                   |              |
| Total Compensation (annualized 1997/1998 compensation) | \$ 3,075,053 |
| Average Compensation                                   | \$ 23,750    |
| Average Age                                            | 43.8         |

## Discussion

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### Contributions

The statutory contributions (as a percent of pay) as of July 1, 1998 are as follows:

|             |               |                       |
|-------------|---------------|-----------------------|
| Basic       | 8.75%         | Employee (was 8.23%)  |
|             | <u>11.43%</u> | Employer (was 10.73%) |
|             | 20.18%        |                       |
| Coordinated | 4.75%         | Employee (was 4.23%)  |
|             | <u>5.18%</u>  | Employer (was 4.48%)  |
|             | 9.93%         |                       |
| Total       | 4.79%         | Employee              |
|             | <u>5.24%</u>  | Employer              |
|             | 10.03%        |                       |

The rates shown reflect an increase of 1.22% of pay as of January 1, 1998.

Required contributions, as defined in Chapter 356, consist of normal cost, an amortization payment (or credit) on the unfunded actuarial accrued liability, and an expense allowance. Required contributions (as a percent of pay) as of July 1, 1998 are as follows:

|              |             |
|--------------|-------------|
| Normal Cost  | 7.58%       |
| Amortization | 2.11%       |
| Expenses     | <u>.22%</u> |
| Total        | 9.91%       |

The normal cost rate increased from 7.11% to 7.58%, and the amortization of the unfunded actuarial accrued liability decreased from 2.51% to 2.11% due to various gains and losses. The allowance for expenses increased from .18% to .22% in recognition of actual experience.

Since the statutory contributions exceed required contributions, the plan has a sufficiency of .12% of pay. This is an improvement since July 1, 1997, when statutory contributions were deficient by .34% of pay.

### Gains and Losses

Experience gains and losses provide a comparison of actual to expected experience. Gain and loss analysis is done for both assets and liabilities. Greater than expected investment return generated a substantial asset gain as of July 1, 1998. On the liability side, the actual liability is reasonably close to what was expected. The fund experienced a gain due to salary increases being less than expected, and a small loss due to mortality being less than expected. Continued growth in the number of participants (there were 4% more participants in 1998 than 1997) partially offset the gains.

More detailed gain and loss information can be found in Section 1.2.

## **Discussion (Continued)**

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### **Assumption Changes**

There have been no assumption changes since July 1, 1997.

### **Plan Changes**

There were no significant plan changes since July 1, 1997 that impacted this valuation.

## Certification

The actuarial valuation required for the Public Employees Retirement Fund has been prepared as of June 30, 1998 by William M. Mercer, Incorporated. In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to determine a sound value for the Association's assets, liability and future contribution requirements. Our calculations are based upon member data and unaudited financial information provided to us by the Association's staff. This data has not been audited by us, but it has been reviewed and found to be consistent, both internally and with prior year's data.

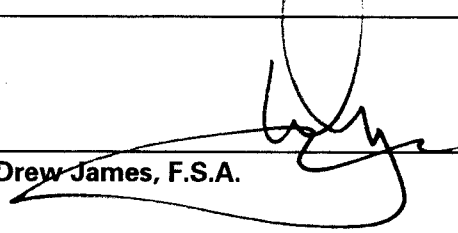
The contribution requirements are determined as a percentage of payroll. Employer rates provide for both normal cost and a contribution to amortize the unfunded actuarial accrued liability. The amortization period for the unfunded actuarial accrued liability is 22 years as of July 1, 1998. The contribution to the unfunded actuarial accrued liability is calculated to remain as a level percentage of future payroll (including projected payroll for future members). Payroll is assumed to increase 6% per year.

There are no changes in the actuarial assumptions used to determine the actuarial present value of benefits in the current valuation.

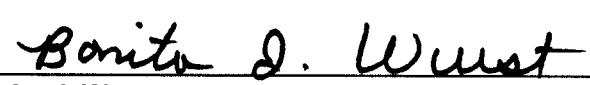
The current assumptions and methods, when applied in combination, fairly represent past and anticipated future experience of the Fund.

Future contribution requirements may differ from those determined in the valuation because of:

- (1) differences between actual experience and anticipated experience;
- (2) changes in actuarial assumptions or methods;
- (3) changes in statutory provisions; and
- (4) differences between the contribution rates determined by the valuation and those adopted.

  
Drew James, F.S.A.

3/19/99  
Date

  
Bonita J. Wurst

3/17/99  
Date

William M. Mercer, Incorporated  
8500 Normandale Lake Boulevard  
Suite 2250  
Minneapolis, MN 55437

☎612-897-8800

## **Section 1: Funding Results**

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**Section 1.1** Determination of Unfunded Actuarial Accrued Liability.

**Section 1.2** Changes in Unfunded Actuarial Accrued Liability.

**Section 1.3** Determination of Contribution Sufficiency (Deficiency).

## Determination Of Unfunded Actuarial Accrued Liability (UAAL) And Supplemental Contribution Rate

|                                                                                            | Actuarial<br>Present Value<br>of Projected<br>Benefits | Actuarial<br>Present Value<br>of Future<br>Normal Costs | Actuarial<br>Accrued<br>Liability |
|--------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------|-----------------------------------|
|                                                                                            | <i>(dollars in thousands)</i>                          |                                                         |                                   |
| 1. Determination of Actuarial<br>Accrued Liability (AAL)                                   |                                                        |                                                         |                                   |
| a. Active Members                                                                          |                                                        |                                                         |                                   |
| 1. Retirement Annuities                                                                    | \$ 4,763,330                                           | \$ 1,077,769                                            | \$ 3,685,561                      |
| 2. Disability Benefits                                                                     | \$ 373,991                                             | \$ 128,777                                              | \$ 245,215                        |
| 3. Survivor's Benefit                                                                      | \$ 98,631                                              | \$ 32,058                                               | \$ 66,573                         |
| 4. Deferred Retirements                                                                    | \$ 1,027,638                                           | \$ 374,194                                              | \$ 653,443                        |
| 5. Refunds Due to Death or<br>Withdrawal                                                   | \$ 133,211                                             | \$ 276,192                                              | \$ (142,981)                      |
| <b>6. Total</b>                                                                            | <b>\$ 6,396,801</b>                                    | <b>\$ 1,888,990</b>                                     | <b>\$ 4,507,811</b>               |
| b. Deferred Retirements With<br>Future Augmentation                                        | \$ 136,963                                             | \$ 0                                                    | \$ 136,963                        |
| c. Former Members Without<br>Vested Rights                                                 | 6,792                                                  | 0                                                       | 6,792                             |
| d. Annuitants                                                                              | \$ 4,173,235                                           | \$ 0                                                    | \$ 4,173,235                      |
| <b>e. Total</b>                                                                            | <b>\$ 10,713,791</b>                                   | <b>\$ 1,888,990</b>                                     | <b>\$ 8,824,801</b>               |
| 2. Determination of Unfunded<br>Actuarial Accrued Liability (UAAL)                         |                                                        |                                                         |                                   |
| a. AAL                                                                                     |                                                        |                                                         | \$ 8,824,801                      |
| b. Actuarial Value of Assets                                                               |                                                        |                                                         | \$ 7,636,668                      |
| c. UAAL                                                                                    |                                                        |                                                         | \$ 1,188,133                      |
| 3. Determination of Supplemental<br>Contribution Rate                                      |                                                        |                                                         |                                   |
| a. Present Value of Future<br>Payrolls Through the<br>Amortization Date of July 1,<br>2020 |                                                        |                                                         | \$ 56,418,826                     |
| b. Supplemental Contribution Rate<br>(2c/3a)                                               |                                                        |                                                         | \$ 2.11%                          |

### Changes in Unfunded Actuarial Accrued Liability (UAAL)

|                                                                                                       | Year Ending<br>June 30, 1998<br><i>(dollars in thousands)</i> |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| 1. UAAL at Beginning of Year                                                                          | \$ 1,391,256                                                  |
| 2. Change Due to Interest Requirements and Current Rate of Funding                                    |                                                               |
| a. Normal Cost and Expenses                                                                           | \$ 234,245                                                    |
| b. Contribution                                                                                       | (291,885)                                                     |
| c. Interest on 1, 2a, and 2b                                                                          | 115,807                                                       |
| <b>d. Total (1+2a+2b)</b>                                                                             | <b>\$ 58,167</b>                                              |
| 3. Expected UAAL at End of Year (1+2d)                                                                | \$ 1,449,423                                                  |
| 4. Increase (Decrease) Due to Actuarial Losses (Gains) Because of Experience Deviations From Expected |                                                               |
| a. Salary Increases                                                                                   | \$ (107,662)                                                  |
| b. Investment Return                                                                                  | (305,238)                                                     |
| c. Mortality                                                                                          | 7,708                                                         |
| d. Other Items                                                                                        | 143,902                                                       |
| <b>e. Total</b>                                                                                       | <b>(261,290)</b>                                              |
| 5. UAAL At End of Year Before Plan Amendments and Changes in Actuarial Assumption (3. + 4.e.)         | \$ 1,188,133                                                  |
| 6. Change in Actuarial Accrued Liability Due to Plan Amendments                                       | 0                                                             |
| 7. Change in Actuarial Accrued Liability Due to Changes in Actuarial Assumptions                      | 0                                                             |
| <b>8. UAAL at End of Year (5. + 6. + 7.)</b>                                                          | <b>\$ 1,188,133</b>                                           |

**Determination of Contribution Sufficiency (Deficiency)**

|                                                                   | <b>July 1, 1998</b><br><i>(dollars in thousands)</i> |                   |
|-------------------------------------------------------------------|------------------------------------------------------|-------------------|
|                                                                   | Percent of Payroll                                   | Dollar Amount     |
| 1. Statutory Contributions - Chapter 353                          |                                                      |                   |
| a. Employee Contributions                                         | 4.79%                                                | \$ 162,179        |
| b. Employer Contributions                                         | 5.24%                                                | 177,504           |
| <b>c. Total</b>                                                   | <b>10.03%</b>                                        | <b>\$ 339,683</b> |
| 2. Required Contributions - Chapter 356                           |                                                      |                   |
| a. Normal Cost                                                    |                                                      |                   |
| 1. Retirement Benefits                                            | 4.46%                                                | \$ 150,840        |
| 2. Disability Benefits                                            | .49%                                                 | 16,690            |
| 3. Survivors                                                      | .12%                                                 | 4,155             |
| 4. Deferred Retirement Benefits                                   | 1.45%                                                | 49,213            |
| 5. Refunds Due to Death or Withdrawal                             | 1.06%                                                | 35,839            |
| <b>6. Total</b>                                                   | <b>7.58%</b>                                         | <b>\$ 256,737</b> |
| b. Supplemental Contribution Amortization by July 1, 2020 of UAAL | 2.11%                                                | \$ 71,339         |
| c. Allowance for Expenses                                         | 0.22%                                                | \$ 7,449          |
| <b>d. Total</b>                                                   | <b>9.91%</b>                                         | <b>\$ 335,525</b> |
| 3. Contribution Sufficiency (Deficiency) [1c-2d]                  | .12%                                                 | \$ 4,158          |

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1998 is \$3,385,720.

## **Section 2: Plan Assets**

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**Section 2.1** Summary of Assets

**Section 2.2** Reconciliation of Assets

**Section 2.3** Actuarial Value of Assets

## Summary of Assets

|                                                  | <b>Market Value</b><br><i>(dollars in thousands)</i> |
|--------------------------------------------------|------------------------------------------------------|
| 1. Assets in Trust                               |                                                      |
| a. Cash, Equivalents, Short-term Securities      | \$ 43,436                                            |
| b. Fixed Income                                  | 953,666                                              |
| c. Equity                                        | 2,959,405                                            |
| d. Real Estate                                   | 154,102                                              |
| e. Equity in MPRIF                               | 3,929,426                                            |
| f. Other                                         | 537                                                  |
| <b>Subtotal</b>                                  | <b>\$ 8,040,572</b>                                  |
| 2. Assets Receivable                             | \$ 1,221                                             |
| 3. Liabilities                                   | \$ (16,732)                                          |
| 4. Net Assets Held in Trust for Pension Benefits |                                                      |
| a. MPRIF Reserves                                | \$ 3,929,426                                         |
| b. Member Reserves                               | 1,151,861                                            |
| c. Other Non-MPRIF Reserves                      | 2,943,774                                            |
| <b>d. Total Assets Available for Benefits</b>    | <b>\$ 8,025,061</b>                                  |

## Reconciliation of Assets

|                                              | Year Ending June 30,<br>1998           |
|----------------------------------------------|----------------------------------------|
|                                              | Market Value<br>(dollars in thousands) |
| 1. Assets Available at Beginning of Period   | \$ 6,870,819                           |
| 2. Additions                                 |                                        |
| a. Member Contributions                      | \$ 140,385                             |
| b. Employer Contributions                    | 151,499                                |
| c. Contributions from other Sources          | 0                                      |
| d. MPRIF Income                              | 547,311                                |
| e. Net Investment Income                     |                                        |
| 1. Interest and Dividends                    | \$ 424,207                             |
| 2. Net Realized Gain (Losses)                | 68,991                                 |
| 3. Net Change in Unrealized Gain (Loss)      | 263,977                                |
| 4. Investment Expenses                       | (5,466)                                |
| 5. Net Subtotal                              | \$ 751,709                             |
| f. Other                                     | 1,382                                  |
| <b>g. Total Additions</b>                    | <b>\$ 1,592,286</b>                    |
| 3. Disbursements                             |                                        |
| a. Service Retirements paid from MPRIF       | \$ 385,356                             |
| b. Service Retirements paid from plan assets | 2,274                                  |
| c. Disability Benefits                       | 9,773                                  |
| d. Survivor Benefits                         | 15,343                                 |
| e. Refunds                                   | 16,922                                 |
| f. Administrative Expenses                   | 7,076                                  |
| g. Other                                     | 1,300                                  |
| <b>h. Total Disbursements</b>                | <b>\$ 438,044</b>                      |
| 4. Other Changes in Reserves                 | \$ 0                                   |
| <b>5. Assets Available at End of Period</b>  | <b>\$ 8,025,061</b>                    |

**Actuarial Value of Assets**

|                                               | <b>July 1, 1998</b>           |
|-----------------------------------------------|-------------------------------|
| 1. Determination of Actuarial Value of Assets | <i>(dollars in thousands)</i> |
| a. Cost Value of Assets                       | \$ 7,442,472                  |
| b. Market Value                               | 8,025,061                     |
| c. Market Over Costs: (b) – (a)               | 582,589                       |
| d. One-third of Market Over Cost: (c)/3       | 194,196                       |
| e. Actuarial Value of Assets (a) + (d)        | \$ 7,636,668                  |

### **Section 3: Basis of Valuation**

---

This section presents and describes the basis of the valuation. The census of participants, actuarial basis and provisions of the Plan are the foundation of the valuation, since these are the present facts on which the projection of benefit payments will depend. The valuation is based on the premise that the Plan will continue in existence.

**Section 3.1** The participant data used for the actuarial valuation.

**Section 3.2** The actuarial funding method, procedures and actuarial assumptions.

**Section 3.3** The plan provisions valued in the actuarial valuation.

**A. Count of Active Participants - Total**

| Age      | Years of Service |        |         |         |         |         |         |         |     | Total   |
|----------|------------------|--------|---------|---------|---------|---------|---------|---------|-----|---------|
|          | 0 - 4            | 5 - 9  | 10 - 14 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40+ |         |
| Under 20 | 509              |        |         |         |         |         |         |         |     | 509     |
| 20 - 24  | 4,547            | 50     |         |         |         |         |         |         |     | 4,597   |
| 25 - 29  | 8,572            | 1,407  | 48      |         |         |         |         |         |     | 10,027  |
| 30 - 34  | 7,414            | 3,800  | 1,386   | 48      |         |         |         |         |     | 12,648  |
| 35 - 39  | 9,337            | 5,066  | 3,400   | 1,602   | 115     |         |         |         |     | 19,520  |
| 40 - 44  | 8,799            | 6,321  | 4,089   | 2,913   | 1,704   | 104     |         |         |     | 23,930  |
| 45 - 49  | 10,618           | 5,999  | 4,546   | 2,886   | 2,566   | 1,081   | 48      |         |     | 27,744  |
| 50 - 54  | 3,372            | 3,611  | 3,675   | 2,625   | 2,057   | 1,443   | 428     | 20      | 1   | 17,232  |
| 55 - 59  | 2,025            | 2,018  | 2,171   | 1,968   | 1,648   | 1,195   | 546     | 69      | 7   | 11,647  |
| 60 - 64  | 1,052            | 1,014  | 1,057   | 935     | 883     | 686     | 192     | 66      | 21  | 5,906   |
| 65 - 69  | 514              | 345    | 276     | 167     | 135     | 98      | 39      | 14      | 6   | 1,594   |
| 70 - 74  | 209              | 167    | 91      | 42      | 37      | 31      | 12      | 4       | 1   | 594     |
| 75+      | 86               | 63     | 30      | 21      | 7       | 6       | 2       | 1       | 2   | 218     |
| Total    | 57,054           | 29,861 | 20,769  | 13,207  | 9,152   | 4,644   | 1,267   | 174     | 38  | 136,166 |

**A. Count of Active Participants - Basic**

| Age      | Years of Service |       |         |         |         |         |         |         |     | Total |
|----------|------------------|-------|---------|---------|---------|---------|---------|---------|-----|-------|
|          | 0 - 4            | 5 - 9 | 10 - 14 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40+ |       |
| Under 20 |                  |       |         |         |         |         |         |         |     |       |
| 20 - 24  |                  |       |         |         |         |         |         |         |     |       |
| 25 - 29  |                  |       |         |         |         |         |         |         |     |       |
| 30 - 34  |                  |       |         |         |         |         |         |         |     |       |
| 35 - 39  |                  |       |         |         |         |         |         |         |     |       |
| 40 - 44  |                  |       |         |         |         |         |         |         |     |       |
| 45 - 49  |                  |       |         |         | 1       | 6       | 23      |         |     | 30    |
| 50 - 54  |                  |       |         |         |         | 7       | 229     | 19      |     | 255   |
| 55 - 59  |                  |       |         |         |         | 7       | 280     | 40      | 5   | 332   |
| 60 - 64  |                  |       |         |         |         | 2       | 98      | 36      | 13  | 149   |
| 65 - 69  |                  |       |         |         |         | 2       | 24      | 9       | 4   | 39    |
| 70 - 74  |                  |       |         |         |         |         | 10      | 4       | 1   | 15    |
| 75+      |                  |       |         |         |         |         | 2       | 1       | 1   | 4     |
| Total    |                  |       |         |         | 1       | 24      | 666     | 109     | 24  | 824   |

**A. Count of Active Participants - Coordinated**

| Age      | Years of Service |        |         |         |         |         |         |         |     | Total   |
|----------|------------------|--------|---------|---------|---------|---------|---------|---------|-----|---------|
|          | 0 - 4            | 5 - 9  | 10 - 14 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40+ |         |
| Under 20 | 509              |        |         |         |         |         |         |         |     | 509     |
| 20 - 24  | 4,547            | 50     |         |         |         |         |         |         |     | 4,597   |
| 25 - 29  | 8,572            | 1,407  | 48      |         |         |         |         |         |     | 10,027  |
| 30 - 34  | 7,414            | 3,800  | 1,386   | 48      |         |         |         |         |     | 12,648  |
| 35 - 39  | 9,337            | 5,066  | 3,400   | 1,602   | 115     |         |         |         |     | 19,520  |
| 40 - 44  | 8,799            | 6,321  | 4,089   | 2,913   | 1,704   | 104     |         |         |     | 23,930  |
| 45 - 49  | 10,618           | 5,999  | 4,546   | 2,886   | 2,565   | 1,075   | 25      |         |     | 27,714  |
| 50 - 54  | 3,372            | 3,611  | 3,675   | 2,625   | 2,057   | 1,436   | 199     | 1       | 1   | 16,977  |
| 55 - 59  | 2,025            | 2,018  | 2,171   | 1,968   | 1,648   | 1,188   | 266     | 29      | 2   | 11,315  |
| 60 - 64  | 1,052            | 1,014  | 1,057   | 935     | 883     | 684     | 94      | 30      | 8   | 5,757   |
| 65 - 69  | 514              | 345    | 276     | 167     | 135     | 96      | 15      | 5       | 2   | 1,555   |
| 70 - 74  | 209              | 167    | 91      | 42      | 37      | 31      | 2       |         |     | 579     |
| 75+      | 86               | 63     | 30      | 21      | 7       | 6       |         |         | 1   | 214     |
| Total    | 57,054           | 29,861 | 20,769  | 13,207  | 9,151   | 4,620   | 601     | 65      | 14  | 135,342 |

**B. Participants in Pay Status**

| <b>Age</b>   | <b>Participants Receiving Benefits</b> |                      |
|--------------|----------------------------------------|----------------------|
|              | <b>Count</b>                           | <b>Total Benefit</b> |
| Under 40     | 127                                    | \$ 57,127            |
| 40-44        | 138                                    | 63,700               |
| 45-49        | 217                                    | 136,093              |
| 50-54        | 340                                    | 262,065              |
| 55-59        | 2,267                                  | 1,748,041            |
| 60-64        | 5,890                                  | 5,184,448            |
| 65-69        | 9,440                                  | 7,916,392            |
| 70-74        | 9,380                                  | 8,477,665            |
| 75-79        | 7,101                                  | 6,228,178            |
| 80-84        | 4,778                                  | 3,835,842            |
| 85-89        | 2,386                                  | 1,608,597            |
| 90-94        | 791                                    | 421,704              |
| 95-99        | 276                                    | 144,002              |
| 100+         | 32                                     | 10,084               |
| <b>Total</b> | <b>43,163</b>                          | <b>\$ 36,093,938</b> |

## Actuarial Basis

### A. Individual Entry Age Normal Method

Liabilities and contributions shown in this report are computed using the Individual Entry Age Normal method of funding.

The objective under this method is to fund each participant's benefits under the Plan as payments which are level as a percentage of salary, starting at original participation date (or employment date), and continuing until the assumed retirement, termination, disability or death.

At the time the funding method is introduced, there will be a liability which represents the contributions which would have been accumulated if this method of funding had always been used. The difference between this liability and the assets (if any) which are held in the fund is the unfunded actuarial accrued liability (UAAL), which is typically funded over a chosen period in accordance with an amortization schedule. If the UAAL is negative, it is still amortized and serves as a credit against future normal cost.

A detailed description of the calculation follows:

- The **normal cost** for each active participant under the assumed retirement age is determined by applying to earnings the level percentage of salary which, if contributed each year from date of entry into the Plan until the assumed retirement (termination, disability or death) date, is sufficient to provide the full value of the benefits expected to be payable.
- The **present value of future normal costs** is the total of the discounted values of all active participants' normal costs, assuming these to be paid in each case from the valuation date until retirement (termination, disability or death) date.
- The **present value of projected benefits** is calculated as the value of all benefit payments expected to be paid to the Plan's current participants, including active and retired members, beneficiaries, and terminated members with vested rights.
- The **accrued liability** is the excess of the present value of projected benefits over the present value of future normal costs.
- The **unfunded actuarial accrued liability** (UAAL) is the excess of the accrued liability over the assets of the fund, and represents that part of the accrued liability which has not been funded by accumulated past contributions.
- The **supplemental contribution amortization** is a level percent of pay payment over a stipulated number of years which is required to amortize the unfunded liability.

### B. Asset Valuation Method

The Actuarial Asset Value is equal to the Cost Value plus one-third of the difference between Market and Cost Value of the assets.

### C. Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the Plan

| <b>Economic</b>                    |                                                                                         |
|------------------------------------|-----------------------------------------------------------------------------------------|
| Investment Return                  | Pre-Retirement: 8.5%<br>Post-Retirement: 6.0%                                           |
| Salary Increases                   | Annual increases according to table on next page                                        |
| Benefit Increases after Retirement | Payment of earnings in post-retirement fund in excess of 6% post-retirement assumption. |

| <b>Other</b>                     |                                                                                                                                                                                                                                                                     |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mortality                        | Pre-Retirement: 1983 Group Annuity Mortality for males and females set back 5 years.<br>Post-Retirement: 1983 Group Annuity Mortality for males and females set forward 1 year.<br>Post-Disability: 1965 RRB rates for males and females.                           |
| Withdrawal                       | Refer to Tables on following pages                                                                                                                                                                                                                                  |
| Expenses                         | Prior year expenses expressed as a percentage of prior year payroll.                                                                                                                                                                                                |
| Disability                       | Refer to Tables on following pages                                                                                                                                                                                                                                  |
| Retirement Age                   | 100% retire at age 64, or one year from valuation date if over age 64. In addition, 50% of members are assumed to retire in the first year eligible for Rule of 90.                                                                                                 |
| Percentage Married at Retirement | Males .....85%<br>Females .....65%                                                                                                                                                                                                                                  |
| Age Difference                   | Males are assumed to be four years older than female spouse                                                                                                                                                                                                         |
| Family                           | Members are assumed to have no children                                                                                                                                                                                                                             |
| Benefit Election                 | Married Males<br><ul style="list-style-type: none"> <li>• 30% elect 50% J &amp; S</li> <li>• 45% elect 100% J &amp; S</li> </ul> Married Females<br><ul style="list-style-type: none"> <li>• 15% elect 50% J &amp; S</li> <li>• 15% elect 100% J &amp; S</li> </ul> |

**C. Actuarial Assumptions** *(continued)*

| <b>TABLE OF SAMPLE SALARY INCREASES</b> |                 |
|-----------------------------------------|-----------------|
| <b>Age</b>                              | <b>Increase</b> |
| 25                                      | 7.6%            |
| 30                                      | 7.2%            |
| 35                                      | 6.9%            |
| 40                                      | 6.4%            |
| 45                                      | 6.2%            |
| 50                                      | 5.7%            |
| 55                                      | 5.7%            |
| 59+                                     | 5.0%            |

| <b>TABLE OF SAMPLE DISABILITY RATES</b> |                          |
|-----------------------------------------|--------------------------|
| <b>Age</b>                              | <b>Males and Females</b> |
| 20                                      | .09%                     |
| 25                                      | .10%                     |
| 30                                      | .11%                     |
| 35                                      | .12%                     |
| 40                                      | .15%                     |
| 45                                      | .22%                     |
| 50                                      | .33%                     |
| 55                                      | .58%                     |
| 60                                      | 1.18%                    |
| 65                                      | 0.0%                     |

**C. Actuarial Assumptions** *(continued)*

| <b>TABLE OF SAMPLE MORTALITY RATES</b> |              |                |
|----------------------------------------|--------------|----------------|
| <b>1983 Group Annuity Mortality</b>    |              |                |
| <b>Attained Age</b>                    | <b>Males</b> | <b>Females</b> |
| 20                                     | .033%        | .014%          |
| 25                                     | .038%        | .019%          |
| 30                                     | .046%        | .025%          |
| 35                                     | .061%        | .034%          |
| 40                                     | .086%        | .048%          |
| 45                                     | .124%        | .067%          |
| 50                                     | .218%        | .101%          |
| 55                                     | .391%        | .165%          |
| 60                                     | .613%        | .254%          |
| 65                                     | .916%        | .424%          |
| 70                                     | 1.559%       | .706%          |

| <b>TABLE OF SAMPLE WITHDRAWAL RATES</b> |              |                |
|-----------------------------------------|--------------|----------------|
| <b>Attained Age</b>                     | <b>Males</b> | <b>Females</b> |
| 20                                      | 25.4%        | 29.1%          |
| 25                                      | 15.4%        | 19.4%          |
| 30                                      | 10.2%        | 13.9%          |
| 35                                      | 7.2%         | 10.5%          |
| 40                                      | 5.3%         | 8.3%           |
| 45                                      | 4.1%         | 6.7%           |
| 50                                      | 3.2%         | 5.5%           |
| 55                                      | 2.0%         | 4.8%           |
| 60                                      | 0.0%         | 0.0%           |

## Summary of Plan Provisions - Basic

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eligibility</b>                                     | A public employee who is not covered under the Social Security Act. General exceptions are employees covered by other public funds and certain part-time employees.                                                                                                                                                                                                                                                                    |
| <b>Contributions</b>                                   | Member: 8.75%* of total salary<br>Employer: 11.43%* of total salary. Additional 2.68% is repealed at full funding.                                                                                                                                                                                                                                                                                                                     |
| <b>Allowable Service</b>                               | Service during which Member contributions were deducted. May also include certain leaves of absence and military service.                                                                                                                                                                                                                                                                                                              |
| <b>Salary</b>                                          | 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, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage. |
| <b>Average Salary</b>                                  | Average of the five highest successive years of salary. Average salary is based on all Allowable Service if less than five years.                                                                                                                                                                                                                                                                                                      |
| <b>Normal Retirement Benefit</b><br><i>Eligibility</i> | Age 65 and three years of Allowable Service. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service.                                                                                                                                                                                                                                                                                                |
| <i>Amount</i>                                          | The greater of:<br>2.2% of Average Salary for each of the first 10 years of Allowable Service and 2.7% of Average Salary for each subsequent year.<br><br><b>OR</b><br>2.7% of Average Salary for each year of Allowable Service.                                                                                                                                                                                                      |
| <b>Early Retirement Benefit</b><br><i>Eligibility</i>  | Age 55 and three years of Allowable Service.<br>Any age with 30 years of Allowable Service.<br>Rule of 90: Age plus Allowable Service totals 90.                                                                                                                                                                                                                                                                                       |

\* Contribution rate increases are effective first full pay period after 12/31/97.

### Summary of Plan Provisions - Basic (Continued)

| <b>Early Retirement Benefit (Cont.)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Amount</i>                           | <p>The greater of</p> <p>2.2% of Average Salary for each of the first 10 years of Allowable Service and 2.7% 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 age 62 if 30 years of Allowable Service. No reduction if age plus years of Allowable Service totals 90;</p> <p style="text-align: center;"><b>OR</b></p> <p>2.7% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3% per year and actuarial reduction for each month the Member is under age 65.</p>                                                                        |
| <i>Form of Payment</i>                  | <p>Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are:</p> <p>25%, 50%, 75%, or 100% joint and survivor with bounce back feature without additional reduction (option canceled if Member is pre-deceased by beneficiary).</p>                                                                                                                                                                                                                                                                                                                                                      |
| <i>Benefit Increases</i>                | <p>Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF). 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 full month but not less than 12 months will receive a partial increase.</p> <p>Members retired under laws in effect before July 1, 1973 receive an additional lump-sum payment each year. In each following year, the lump-sum payment will increase by the same percentage increase that is applied to regular annuities paid from MPRIF.</p> |

**Summary of Plan Provisions - Basic (Continued)**

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Disability Benefit</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Eligibility</i>                 | Total and permanent disability before normal retirement age with three years of Allowable Service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <i>Amount</i>                      | <p>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 5-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.</p> <p>If a Member became disabled prior to July 1, 1998, but did not commence their benefit before July 1, 1998, 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% to 6%.</p> <p>Payments stop 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% family maximum. Payments change to a retirement annuity at normal retirement age. Benefits may be reduced on resumption of partial employment.</p> |
| <i>Form of Payment</i>             | Same as for retirement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Benefit Increases</i>           | Adjusted by PERA to provide same increases as MPRIF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Retirement After Disability</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Eligibility</i>                 | Normal retirement age.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Amount</i>                      | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <i>Benefit Increases</i>           | Same as for retirement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Summary of Plan Provisions - Basic (Continued)

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Surviving Spouse Benefit</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Eligibility</i>                       | Active Member with 18 months of Allowable Service or Member receiving a disability benefit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>Amount</i>                            | <p>50% of salary averaged over last six months. Family benefit is maximum of 70% and minimum of 50% of average salary. Benefit paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991.</p> <p>If a Member became deceased prior to July 1, 1998 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1998, the benefit payable is calculated under the laws in effect before July 1, 1998, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5% to 6%.</p> <p>Surviving spouse optional annuity may be elected in lieu of this benefit.</p> |
| <b>Surviving Dependent Child Benefit</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Eligibility</i>                       | Active Member with 18 months of Allowable Service or Member receiving a disability benefit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>Amount</i>                            | <p>10% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 50% of salary and maximum of 70% of average salary. Benefits paid until child marries, dies, or attains age 18 (age 22 if full-time student).</p> <p>If a Member became deceased prior to July 1, 1998 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1998, the benefit payable is calculated under the laws in effect before July 1, 1998, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5% to 6%.</p>                                        |
| <b>Surviving Spouse Optional Annuity</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Eligibility</i>                       | Member or former Member who dies before retirement benefits commence and other survivor annuity is waived by spouse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Amount</i>                            | 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 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 actuarially equivalent dependent child benefit is paid to age 20 or for five years if longer.                                                                                                                                                               |

**Summary of Plan Provisions - Basic (Continued)**

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Surviving Spouse Optional Annuity (Cont.)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Amount (Cont.)</i>                            | If a Member became deceased prior to July 1, 1998 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1998, the benefit payable is calculated under the laws in effect before July 1, 1998, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5% to 6%.                                                                                                                                                                                                                                            |
| <i>Benefit Increases</i>                         | Adjusted by PERA to provide same increase as MPRIF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Refund of Contributions (Death)</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Eligibility</i>                               | Member dies before receiving any retirement benefits and survivor benefits are not payable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Amount</i>                                    | The excess of the Member's contributions with 6% interest over any disability or survivor benefits paid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Deferred Benefit</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Eligibility</i>                               | Three years of Allowable Service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Amount</i>                                    | Benefit computed under law in effect at termination and increased by the following percentage compounded annually: 0% before 7/1/71; 5% from 7/1/71 to 1/1/81; and 3% thereafter until January 1 of the year following attainment at age 55 and 5% thereafter until the annuity begins. Amount is payable as a normal or early retirement.<br><br>If a Member terminated employment prior to July 1, 1998, but was not eligible to commence their pension before July 1, 1998, an actuarial increase shall be made for the change in the post-retirement interest rates from 5% to 6%. |
| <b>Refund of Contributions (Termination)</b>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Eligibility</i>                               | Termination of public service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Amount</i>                                    | Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989 and 6% interest if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund if three or more years of Allowable Service.                                                                                                                                                                                                                                                                                                           |

**Summary of Significant Changes in Benefits**

No significant changes in benefits were recognized for this valuation.

## Summary of Plan Provisions - Coordinated

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eligibility</b>               | A public employee who is covered under the Social Security Act. General exceptions are employees covered by other public funds and certain part-time employees. City managers and persons holding elective office may choose to become Members.                                                                                                                                                                                         |
| <b>Contributions</b>             |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                  | <b>Member:</b> 4.75% of total salary.<br><b>Employer:</b> 5.18%* of total salary. Additional 0.43% is repealed at full funding.                                                                                                                                                                                                                                                                                                         |
| <b>Allowable Service</b>         | Service during which Member contributions were deducted. May also include certain leaves of absence and military service.                                                                                                                                                                                                                                                                                                               |
| <b>Salary</b>                    | 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, cafeteria plans, health care expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage. |
| <b>Average Salary</b>            | Average of the five highest successive years of salary. Average salary is based on all Allowable Service if less than five years.                                                                                                                                                                                                                                                                                                       |
| <b>Normal Retirement Benefit</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Eligibility</i>               | <b>First hired before July 1, 1989:</b><br>Age 65 and three years of Allowable Service. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service.                                                                                                                                                                                                                                                      |
| <i>Amount</i>                    | The greater of:<br>1.2% of Average Salary for each of the first 10 years of Allowable Service and 1.7% of Average Salary for each subsequent year;<br><b>OR</b><br>1.7% of Average Salary for each year of Allowable Service.                                                                                                                                                                                                           |
| <i>Eligibility</i>               | <b>First hired after June 30, 1989:</b><br>The greater of age 65 or the age eligible for full Social Security retirement benefits but no later than age 66 and three years of Allowable Service. Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service.                                                                                                                              |
| <i>Amount</i>                    | 1.7% of Average Salary for each year of Allowable Service.                                                                                                                                                                                                                                                                                                                                                                              |

\*Contribution rate increases are effective first full pay period after 12/31/97.

### Summary of Plan Provisions - Coordinated (Continued)

| Early Retirement Benefit  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Eligibility</i>        | <p><b>First hired before July 1, 1989:</b></p> <p>Age 55 and three years of Allowable Service. Any age with 30 years of Allowable Service. Rule of 90: Age plus Allowable Service totals 90.</p> <p><b>First hired after June 30, 1989:</b></p> <p>Age 55 with three years of Allowable Service.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Amount</i>             | <p><b>First hired before July 1, 1989:</b></p> <p>The greater of</p> <p>1.2% of Average Salary for each of the first 10 years of Allowable Service and 1.7% 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 age 62 if 30 years of Allowable Service. No reduction if age plus years of Allowable Service totals 90;</p> <p style="text-align: center;"><b>OR</b></p> <p>1.7% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3% per year and actuarial reduction for each month the Member is under age 65.</p> <p><b>First hired after July 30, 1989:</b></p> <p>1.7% of Average Salary for each year of allowable Service assuming augmentation to the age eligible for full Social Security retirement benefits at 3% per year and actuarial reduction for each month the Member is under the Social Security retirement age, but no later than age 66.</p> |
| <i>Form of Payment</i>    | <p>Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are:</p> <p>25%, 50%, 75% or 100% joint and survivor with bounce back feature without additional reduction (option canceled if Member is pre-deceased by beneficiary).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Benefit Increases:</i> | <p>Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF). A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Benefit recipients receiving benefits for at least one full month but less than 12 full months will receive a partial increase.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### Summary of Plan Provisions - Coordinated (Continued)

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Early Retirement Benefit (cont.)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>Benefit Increases (cont.)</i>        | 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 MPRIF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Disability Benefit</b>               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>Eligibility</i>                      | Total and permanent disability before normal retirement age with three years of Allowable Service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>Amount</i>                           | <p>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.</p> <p>If a Member became disabled prior to July 1, 1998, but did not commence their benefit before July 1, 1998, the benefit payable is calculated under the laws in effect before July 1, 1998, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5% to 6%.</p> <p>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.</p> |
| <i>Form of Payment</i>                  | Same as for retirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Benefit Increases</i>                | Adjusted to PERA to provide same increase of MPRIF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Retirement After Disability</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>Eligibility</i>                      | Normal retirement age.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Amount</i>                           | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Benefit Increases</i>                | Same as for retirement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**Summary of Plan Provisions - Coordinated (Continued)**

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Surviving Spouse Optional Annuity</b>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Eligibility</i>                           | Member or former Member who dies before retirement or disability benefit commence.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>Amount</i>                                | <p>Survivor's payment of the 100% joint and survivor benefit the Member could have elected if terminated or an actuarially equivalent term certain annuity.. If commencement is prior to age 65 (age 62 if 30 years of service), the benefit is reduced 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.</p> <p>If Member became deceased prior to July 1, 1998 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1998, the benefit payable is calculated under the laws in effect before July 1, 1998, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5% to 6%.</p> |
| <i>Benefit Increases</i>                     | Adjusted by PERA to provide same increase as MPRIF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Refund of Contributions (Death)</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Eligibility</i>                           | Member dies before receiving any retirement benefits and survivor benefits are not payable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>Amount</i>                                | The excess of the Member's contributions with 6% interest over any disability or survivor benefits paid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Deferred Benefit</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Eligibility</i>                           | Three years of Allowable Service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Amount:</i>                               | Benefit computed under law in effect at termination and increased by the following percentage compounded annually: 0% before 7/1/71; 5% from 7/1/71 to 1/1/81; and 3% thereafter until January 1 of the year following attainment of age 55 and 5% thereafter under the annuity begins. Amount is payable as a normal or early retirement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Refund of Contributions (Termination)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Eligibility</i>                           | Termination of public service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>Amount</i>                                | Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989 and 6% interest if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund if three or more years of Allowable Service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**Summary of Plan Provisions - Coordinated (Continued)**

| <b>Refund of Contributions (Termination)</b> |                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Amount (cont.)</i>                        | If a Member terminated employment prior to July 1, 1998, but was not eligible to commence their pension before July 1, 1998, the benefit payable is calculated under the laws in effect before July 1, 1998, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5% to 6%. |

**Summary of Significant Changes in Benefits**

No significant changes in benefits were recognized for this valuation.