# Actuarial Valuation Report as of January 1, 2017 for the ERIE COUNTY EMPLOYEES' RETIREMENT SYSTEM

Prepared by:

Northwest Retirement Services
1030 State Street, Suite 2
Erie, PA 16501
(814) 455-4550

# CONTENTS OF REPORT

# SECTION 1
# HIGHLIGHTS

This report contains a detailed description and the results of a valuation by Northwest Retirement Services of the Erie County Employees' Retirement System as of January 1, 2017. The contents of this report include a summary of the actuarial position of the Plan as of January 1, 2017 and the contribution for the 2017 plan year, in accordance with the funding standards of Section 6 of Act 96, 1971 of the Commonwealth of Pennsylvania as amended.

## Annual Required Contribution

The Annual Required Contribution for the plan year ending December 31, 2017 is $4,642,134. See Section 5 for the history of employer contributions.

## Plan Changes

There have been no changes in the plan benefit provisions since the date of the last report.

## Cost Method Changes

There have been no changes in cost method since the date of the last report.

## Assumption Changes

There have been no changes in the actuarial assumptions since the date of the last report.

## Actuarial Experience

During 2016, the Plan experienced a slight actuarial gain due primarily to investment returns on an actuarial value basis greater than anticipated. The investment yield on an actuarial value basis, net of expenses, was approximately 8.42%. The investment yield on a market value basis, net of expenses, was approximately 8.41%.

## Funded Status of the Plan

As of January 1, 2017, the ratio of the market value of assets to the actuarial accrued liability is 94%. This means the Plan is strongly funded.

This percentage compares to 94% on the prior valuation date.

**Cost of Living Increase**

Effective January 1, 2017, the Retirement Board granted a cost-of-living increase to the retirees of the Plan. The amount required to fund the cost-of-living increase equals $351,251.

In our opinion, this report presents fairly the financial and actuarial position for the Erie County Employees' Retirement System as of January 1, 2017 in accordance with generally accepted actuarial principles, and on the basis of actuarial assumptions and methods which, in the aggregate, are reasonable (taking into account past experience under the Plan and reasonable expectations) and which in combination represent our best estimate of anticipated experience.

We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. We are available to provide further information or answer any questions with respect to this report.

May, 2017

Don Boetger

Don J. Boetger, MAAA, FSPA
Actuary and Consultant

Cynthia A. Marzka

Cynthia A. Marzka, MAAA, ASA
Actuary and Consultant

# SECTION 2
# SUMMARY OF VALUATION RESULTS

## Section 2.1
## Assets of the Plan

Below is a statement of changes in plan net assets as well as a list of the total assets by classification, as provided by the County.

| ERIE COUNTY EMPLOYEES' RETIREMENT SYSTEM | | |
|---|---|---|
| **CHANGES IN PLAN NET ASSETS FOR THE 2016 AND 2015 CALENDAR YEARS** | | |
| **Additions** | | |
| | **2016 Total** | **2015 Total** |
| Contributions | | |
| County | $ 4,321,221 | $ 4,341,227 |
| Plan Members | 3,244,397 | 3,057,133 |
| Total Contributions | 7,565,618 | 7,398,360 |
| Investment Income | | |
| Net Appreciation/Depreciation in Fair Value of Investments | 9,874,155 | (18,199,578) |
| Interest | 1,862,321 | 965,813 |
| Dividends | 3,717,990 | 5,190,709 |
| Realized Capital Gains | 4,190,266 | 13,438,016 |
| Loss Recovery | 18,600 | 30,422 |
| Securities Lending | 187,647 | 40,162 |
| Less Investment Expense | 747,247 | 835,385 |
| Net Investment Income | 19,103,732 | 630,159 |
| Total Additions | 26,669,350 | 8,028,519 |
| **Deductions** | | |
| Benefits | 13,937,217 | 13,238,599 |
| Refunds of Contributions | 438,507 | 368,013 |
| Administrative Expense | 197,018 | 197,913 |
| Total Deductions | 14,572,742 | 13,804,525 |
| Net Increase | 12,096,608 | (5,776,006) |
| **Net Assets Held In Trust For Pension Benefits** | | |
| Beginning of Year | 230,678,610 | 236,454,616 |
| End of Year | $ 242,775,218 | $ 230,678,610 |

## ERIE COUNTY EMPLOYEES' RETIREMENT PLAN

### PLAN ASSETS AS OF DECEMBER 31, 2016 AND 2015

| Assets | | |
|---|---|---|
| | **2016** | **2015** |
| Cash and Short Term Investments | $ 3,346,741 | $ 5,901,813 |
| Receivables | 0 | 0 |
| Investments, at fair value | | |
| U.S. Government Obligations | $ 22,664,040 | $ 27,808,786 |
| Domestic Corporate Bonds | 32,320,256 | 33,363,209 |
| Domestic Common Stocks | 64,374,687 | 55,401,237 |
| Mutual Funds- Fixed | 13,625,469 | 13,243,772 |
| Mutual Funds - Equity | 57,397,141 | 52,585,106 |
| Equity Fund | 743,434 | 510,111 |
| International Equities | 11,752,849 | 11,460,166 |
| Property Trust | 14,604,884 | 16,565,399 |
| Asset Backed Securities | 0 | 4,707,211 |
| Master Limited Partnership | 9,512,107 | 8,594,988 |
| Other Fixed Income | 11,844,461 | 0 |
| Accrued Income | 589,149 | 536,812 |
| Total Investments | $ 239,428,477 | $ 224,776,797 |
| Total Assets | $ 242,775,218 | $ 230,678,610 |
| **Liabilities** | | |
| Refunds Payable and Other | 0 | 0 |
| **Net Assets Held In Trust For Pension Benefits** | | |
| | $ 242,775,218 | $ 230,678,610 |

## Section 2.2
## Approximate Rate of Return

| APPROXIMATE RATE OF RETURN FOR 2016 PLAN YEAR (MARKET VALUE) | |
|---|---|
| 1.) Market Value as of December 31, 2015 | $ 230,678,610 |
| 2.) Contributions Received During Year | 7,565,618 |
| 3.) Benefits and Expenses Paid During Year | 15,319,989 |
| 4.) Market Value as of December 31, 2016 | 242,775,218 |
| 5.) Non-Investment Increment: (2) – (3) | (7,754,371) |
| 6.) Investment Increment: (4) – (1) – (5) | 19,850,979 |
| 7.) Time Weighted Value of Assets: (1) + .5(5) | 226,801,425 |
| 8.) Approximate Rate of Return for 2016: (6) / (7) | 8.75% |

**HISTORY OF RATE OF RETURNS**

| Plan Year | Rate of Return |
|---|---|
| 2015 | 0.63% |
| 2014 | 6.50% |
| 2013 | 19.85% |
| 2012 | 11.88% |
| 2011 | 1.52% |
| 2010 | 13.46% |
| 2009 | 22.21% |
| 2008 | -23.17% |
| 2007 | 10.15% |
| 2006 | 12.70% |

# Section 2.3
# Actuarial Value of Assets

The asset valuation method is the "smoothed market value (with phase-in)" method, using a smoothing period of 5 years, as described in paragraph 3.16 of IRS Revenue Procedure 2000-40. When fully phased in, the actuarial value of assets will equal the market value of assets with gains subtracted or losses added at the rate described below:

a. 4/5 of the prior year's gain or loss
b. 3/5 of the second preceding year's gain or loss
c. 2/5 of the third preceding year's gain or loss
d. 1/5 of the fourth preceding year's gain or loss

The gain or loss for a year is determined by calculating the difference between the expected value of assets for the year and the market value of assets at the valuation date. The expected value of assets for the year is market value of assets at the prior-year valuation date brought forward with interest at the valuation interest rate to the current valuation date, plus contributions minus benefit disbursements (benefits and expenses), all adjusted with interest at the valuation rate to the current valuation date. If the expected value is less than the market value, the difference is a gain. If the expected value is greater than the market value, there is a loss.

In the first year, the actuarial value of assets is equal to the market value of assets. In subsequent years, the smoothed value is calculated as described above, except that the only gains or losses recognized are those occurring in the year of the change and later. In general, the actuarial value of assets must fall between 80% and 120% of the market value of assets.

## ACTUARIAL VALUE OF ASSETS
## CALCULATION OF ASSET (GAIN) OR LOSS FOR THE YEAR

| | Expected Value |
|---|---|
| Market Value at Beginning of Year | $ 230,678,610 |
| Interest Expected Using Valuation Assumption | 17,300,896 |
| Plus Actual Contributions | 7,565,618 |
| Minus Actual Distributions | (15,319,989) |
| Interest Expected on Contributions and Distributions | (290,701) |
| Expected Value at End of Year | $ 239,934,434 |
| Market Value at End of Year | 242,775,218 |
| (Gain) or Loss for Year | $ (2,840,784) |

## COMPUTATION OF ADJUSTMENT

| Year | (Gain) or Loss | Adjustment Percent | Adjustment Amount |
|---|---|---|---|
| 2016 | (2,840,784) | .80 | (2,272,627) |
| 2015 | 15,996,759 | .60 | 9,598,055 |
| 2014 | 2,243,564 | .40 | 897,426 |
| 2013 | (23,589,048) | .20 | (4,717,810) |
| 2012 | (7,531,587) | .00 | 0 |
| Total Adjustment | | | $ 3,505,044 |

## Determination of Actuarial Value of Assets

| | | |
|---|---|---|
| Market Value of Assets | $ | 242,775,218 |
| Adjustment | | 3,505,044 |
| Actuarial Value of Assets | $ | 246,280,262 |

In general, the Actuarial Value of Assets must fall between 80% and 120% of the Market Value of Assets.

| | | |
|---|---|---|
| Lower Limit (80% of Fair Market Value) | $ | 194,220,174 |
| Actuarial Value of Assets | $ | 246,280,262 |
| Upper Limit (120% of Fair Market Value) | $ | 291,330,262 |

## Section 2.4
## Allocation of Assets

This Section shows the allocation of the assets among the Plan's reserve accounts (see Section 2.8 for Determination of Reserve Balances) and the Plan's liabilities as of January 1, 2017. The liabilities were determined from the actuarial valuation of the Plan based upon the data submitted by the County.

| ASSETS | |
|---|---|
| Members' Annuity Reserve Account | $ 45,909,930 |
| County Annuity Reserve Account | 45,548,553 |
| Retired Members' Reserve Account | 129,089,516 |
| Unrealized Appreciation in Assets | 22,227,219 |
| ***Total Assets, (Market Value) of the Erie County Employees' Retirement System*** | $ 242,775,218 |
| **LIABILITIES** | |
| Actuarial Present Value of: | |
| Accumulated Plan Benefits | |
| Vested | $ 51,669,583 |
| Nonvested | 2,460,042 |
| Future Benefit Accruals | 42,229,692 |
| Terminated Vested Benefits | 5,910,443 |
| Retired Benefits | 129,089,516 |
| Member Accumulated Deductions | 45,909,930 |
| ***Total Liabilities of the Erie County Employees' Retirement System*** | $ 277,269,206 |

# Section 2.5
# Normal Cost and Unfunded Actuarial Accrued Liability

This Section shows the Normal Cost and Unfunded Actuarial Accrued Liability for 2017 for the Erie County Employees' Retirement System.

| Normal Cost for 2017 | |
|---|---|
| a. Retirement Benefits | $ 1,963,042 |
| b. Termination Benefits | 649,054 |
| c. Death Benefits | 31,845 |
| Total Normal Cost | $ 2,643,941 |

| Unfunded Actuarial Accrued Liability as of January 1, 2017 | |
|---|---|
| 1. Active Participants | |
| a. Retirement Benefits | $ 71,901,337 |
| b. Termination Benefits | 4,137,424 |
| c. Death Benefits | 937,525 |
| d. Total | $ 76,976,286 |
| 2. Terminated Vested Participants | $ 5,910,443 |
| 3. Retired Members and Beneficiaries | |
| a. Retirement Benefits | $ 126,815,735 |
| b. Cost of Living Benefits | 2,273,781 |
| c. Total | $ 129,089,516 |
| 4. Member Accumulated Deductions | $ 45,909,930 |
| 5. Total Actuarial Accrued Liability | $ 257,886,175 |
| 6. Actuarial Value of Assets | $ 246,280,262 |
| 7. Unfunded Actuarial Accrued Liability | $ 11,605,913 |

## Section 2.6
## Annual Required Contribution

This Section shows the development of the amortization payment and the calculation of the Annual Required Contribution for 2017.

The amortization schedule is as follows:

| | |
|---|---|
| Initial Liability | 30 Years |
| Actuarial Gains / Losses | 20 Years |
| Change in Assumptions | 15 Years |
| State Mandated Benefit Changes | 20 Years |
| Local Benefit Changes for Active Employees | 10 Years |
| Local Benefit Changes for Retired Employees | 1 Year |

If the remaining average period between the current average attained age of active members and the later of earliest average normal retirement age or average assumed retirement age is less than the above amortization periods, the longest applicable remaining average period rounded to the next largest whole number shall be used.

**Amortization Payment**

| Source | Initial Liability | Effective Date | Remaining Period | Outstanding Balance | Amortization Charge |
|---|---|---|---|---|---|
| Initial Liability | $14,061,142 | 1/1/2015 | 9 Years | $ 12,261,003 | $ 1,788,021 |
| Actuarial Gain | (473,814) | 1/1/2016 | 9 Years | (455,673) | (66,451) |
| Ret. COLA inc. | 351,251 | 1/1/2017 | 1 Year | 351,251 | 351 251 |
| Actuarial Gain | (550,668) | 1/1/2017 | 10 Years | (550,668) | (74,628) |
| Total | | | | $ 11,605,913 | $ 1,998,193 |

The Annual Required Contribution is calculated by adding the Normal Cost Component and the Total Amortization Charge. For 2017, the Annual Required Contribution is determined to be $4,642,134.

**Development of the Annual Required Contribution for 2017**

| | |
|---|---|
| 1. Normal Cost Component | $ 2,643,941 |
| 2. Amortization Payment | 1,998,193 |
| 3. Annual Required Contribution for 2017 | $ 4,642,134 |

## Section 2.7
## Notes to Sections 2.4 and 2.8

The following are notes to Sections 2.4 and 2.8

**Members' Annuity Reserve Account**

The balance of $45,909,930 in this account is the total of the contributions deducted from the salaries of the active and terminated vested members of the retirement system and the IRC 414(h)(2) pickup contributions together with the interest additions as of January 1, 2017. Since these accumulations represent the present value as of January 1, 2017 of future benefits, the reserve balance and liability are identical.

**County Annuity Reserve Account**

The balance of $67,775,772 in this account as of January 1, 2017 and the amounts expected to be credited in the future, plus investment earnings thereon, represent the reserves set aside for the payment of the county's share of the retirement allowances.

When a County Annuity is scheduled to commence for a particular member, sufficient monies are transferred from the County Annuity Reserve Account to the Retired Members' Reserve Account to provide for such County Annuities actually entered upon.

**Retired Members Reserve Account**

This is the account out of which monthly retirement allowances including cost-of-living increases and death benefits are paid.

The assets allocated to this reserve account as of January 1, 2017 amount to $129,089,516. The corresponding liability for those annuitants on the roll is identical.

# Section 2.8
# Determination of Reserve Balances

| | Members Annuity Reserve Account | County Annuity Reserve Account | Retired Members Reserve Account | TOTAL |
|---|---|---|---|---|
| Balance 1/1/16 | $ 44,872,299 | $ 51,172,709 | $ 122,280,538 | $ 218,325,546 |
| Member Contributions | 3,237,214 | 7,183 | 0 | 3,244,397 |
| County Appropriations | 0 | 4,321,221 | 0 | 4,321,221 |
| | | | | |
| Net Investment Income | 0 | 9,976,824 | 0 | 9,976,824 |
| Miscellaneous Income | 0 | 0 | 0 | 0 |
| Active Death Refunds | 0 | 0 | 0 | 0 |
| Member Contributions Refunded | (438,507) | 0 | (604,477) | (1,042,984) |
| | | | | |
| Pension Payments | 0 | 0 | (12,789,153) | (12,789,153) |
| Death Benefits | (142,890) | (400,697) | 0 | (543,587) |
| Retiree and Death Benefit Transfers | (3,389,034) | (7,269,526) | 10,658,560 | 0 |
| Cost-of-Living Funding Requirement | 0 | 0 | 0 | 0 |
| Administrative Expenses | 0 | (197,018) | 0 | (197,018) |
| Investment Expenses | 0 | (747,247) | 0 | (747,247) |
| | | | | |
| Balance Before Interest | 44,139,082 | 56,863,449 | 119,545,468 | 220,547,999 |
| Interest Allocated in 2016 | 1,770,848 | (10,839,323) | 9,068,475 | 0 |
| Balance Before Actuarial Adjustments | 45,909,930 | 46,024,126 | 128,613,943 | 220,547,999 |
| Actuarial Adjustments | 0 | (475,573) | 475,573 | 0 |
| Ending Balance 1/1/17 | 45,909,930 | 45,548,553 | 129,089,516 | 220,547,999 |
| | | | | |
| Unrealized Appreciation | 0 | 22,227,219 | 0 | 22,227,219 |
| Assets (Market Value) 1/1/17 | $ 45,909,930 | $ 67,775,772 | $ 129,089,516 | $ 242,775,218 |

# SECTION 3
# PLAN DEMOGRAPHICS

## Section 3.1
## Membership History

Below is a ten-year history of the Retirement System's membership.

| ACTIVE MEMBERS AND VESTED TERMINATED MEMBERS | | | | RETIRED MEMBERS AND BENEFICIARIES | | |
|---|---|---|---|---|---|---|
| **January 1** | **Male** | **Female** | **Total** | **Male** | **Female** | **Total** |
| 2017 | 560 | 774 | 1,334 | 254 | 480 | 734 |
| 2016 | 537 | 762 | 1,299 | 254 | 452 | 706 |
| 2015 | 537 | 770 | 1,307 | 243 | 413 | 656 |
| 2014 | 521 | 761 | 1,282 | 224 | 401 | 625 |
| 2013 | 522 | 757 | 1,279 | 211 | 379 | 590 |
| 2012 | 533 | 763 | 1,296 | 197 | 363 | 560 |
| 2011 | 537 | 751 | 1,288 | 187 | 346 | 533 |
| 2010 | 531 | 771 | 1,302 | 171 | 323 | 494 |
| 2009 | 533 | 774 | 1,307 | 157 | 304 | 461 |
| 2008 | 500 | 777 | 1,277 | 152 | 291 | 443 |

## Section 3.2
## Changes in Plan Participation from January 1, 2016 to January 1, 2017

| ACTIVE PARTICIPANTS | |
|---|---|
| Number as of January 1, 2016 | 1,160 |
| Changes During Plan Year: | |
| Retired | (32) |
| Terminated and Vested | (27) |
| Terminated | (85) |
| Died | (1) |
| New Participants | 171 |
| Number as of January 1, 2017 | 1,186 |

| RETIRED PARTICIPANTS | |
|---|---|
| Number as of January 1, 2016 | 706 |
| Changes During Plan Year: | |
| Lump Sum Distribution | 0 |
| Died | (21) |
| New Retirements from Active Service | 32 |
| New Surviving Annuitants | 4 |
| Vested Terminated Participants Whose Benefits Commenced | 11 |
| New Retiree due to Domestic Relations Order | 2 |
| Number as of January 1, 2017 | 734 |

| TERMINATED VESTED PARTICIPANTS | |
|---|---|
| Number as of January 1, 2016 | 139 |
| Changes During Plan Year: | |
| Terminated | 0 |
| Returned to Active Service | (2) |
| Benefits Commenced | (11) |
| Died | 0 |
| Distributions | (5) |
| New Terminations with Vesting | 27 |
| Number as of January 1, 2017 | 148 |

# Section 4
# Basis of Valuation

## Section 4.1
## Summary of Plan Provisions

| | |
|---|---|
| **Effective Date** | The effective date of this plan is January 1, 1942. |
| **Administration** | Retirement Board as designated in Act 96 of 1971, the County Pension Law. |
| **Eligibility for Plan Membership** | An Employee shall be eligible to become a participant immediately upon becoming an Employee. Part-time Employees may not be covered depending on hours. |
| **Employee Contributions** | Each member of the retirement system must contribute 5% of his salary. Currently, Employee contributions will be credited with 4.0% interest. The amount of Employee contributions and rate of interest may be changed from time to time at the direction of the Retirement Board. Employee contributions have been picked-up or pre-tax since January 1, 1983. Voluntary contributions, up to another 10% of pay, are allowed. |
| **Compensation** | Total pay received as a county Employee excluding refunds for expenses, contingency and accountable expense allowances and excluding severance payments or payments for unused vacation or sick leave. |
| **Final "Average" Salary** | The average of the member's annual compensation received for the three years which produce the highest such average. |
| **Credited Service** | Credit is provided for each year, month and day of your service during membership. Non-intervening military service (up to 5 years) may be purchased. |

## Section 4.2
## Benefit Formula and Retirement Dates

**Normal Retirement**

***Eligibility:*** Retirement occurs at age 60 or at age 55 if the participant has completed 20 years of service.

***Pension:*** Effective March 1, 2007 a monthly pension equal to (a) and (b), as follows:

(a) 1.000% of 1/12th of Final "Average" Salary multiplied by years of credited service from 1/1/50 to 1/1/72,

1.667% of 1/12th of Final "Average" Salary multiplied by years of credited service after 1/1/72,

**-- PLUS --**

(b) a monthly annuity based on the actuarial equivalent of the member's accumulated contributions with credited interest.

**Early Retirement**

***Eligibility:***

***Voluntary:*** Upon completion of 20 years of service

***Involuntary:*** Upon completion of 8 years of service.

***Pension:***

(a) a monthly pension equal to the actuarial equivalent of the benefits calculated based on the plan formula,

**-- PLUS --**

(b) a monthly annuity based on the actuarial equivalent of the member's accumulated contributions with credited interest.

**Postponed Retirement**

A member may work past normal retirement age and continue to accrue pension credits.

| | |
|---|---|
| **Vesting** | One Hundred Percent (100%) upon completion of five years of credited service. A member who terminates employment after five years of credited service will receive a deferred annuity commencing at age 60 (or at age 55 if the member has at least 20 years of service at termination). The deferred benefit shall be calculated using the normal retirement pension formula but based on credited service, final average salary and accumulated contributions at termination.<br><br>If a member terminates employment prior to entitlement to Plan benefits, he will receive his accumulated contributions with interest. |
| **Disability Retirement** | ***Eligibility:*** Total and permanent disability prior to super-annuation (Normal Retirement) age and after completion of five years of credited service.<br><br>***Pension:*** A total monthly pension commencing on the last day of the month following disability retirement equal to 25% of the 1/12th of Final Average Salary at time of retirement. Such total monthly pension shall include the monthly disability that is actuarially equivalent to the member's accumulated contributions at retirement. |
| **Death Benefits** | (a) Pre-Retirement. If a member dies after having attained age 60 <u>or</u> having completed ten years of credited service, his beneficiary will receive a lump sum equal to the actuarially determined present value of the benefits calculated in based on the member's Final Average Salary and credited service at time of death plus the member's accumulated contributions with interest at time of death.<br><br>(b) Post-Retirement. Upon the death of a terminated or retired member, his beneficiary will receive survivor benefits, if any, in accordance with the form under which benefits were being paid to the member. In any event, the total amount of benefits paid to the deceased member and beneficiary must, at least, equal the member's accumulated contributions with interest. |

## Section 4.3
## Benefit Options and Miscellaneous

**Normal Form of Pension**

Benefits are payable in the form of a life annuity, that is for the member's lifetime only, except that benefits shall never be less than the Employee contribution account plus interest.

**Optional Retirement**

A member may elect to receive the actuarial benefits equivalent of his retirement benefits as a full cash refund annuity or a reduced joint and survivor pension payable for the remainder of his life, with either 100% or 50% of the member's pension continuing after death to the designated beneficiary. A member may also elect to receive, in one payment, the full amount of his accumulated deductions and continue to receive the annuity provided by the county.

**Cost-of-Living**

The cost-of-living increase shall be reviewed at least once in every three years by the Retirement Board. The Board has granted cost-of-living increases in the past as follows:

| PERCENTAGE CHANGE IN C.P.I. | EFFECTIVE DATE OF INCREASE |
|---|---|
| 50 % | 1/1/98 |
| 50 % | 1/1/99 |
| 50 % | 1/1/00 |
| 50 % | 1/1/01 |
| 50 % | 1/1/02 |
| 50 % | 1/1/03 |
| 50 % | 1/1/04 |
| 50 % | 1/1/05 |
| 50 % | 1/1/06 |
| 50 % | 1/1/07 |
| 50 % | 1/1/08 |

# Section 4.4
# Actuarial Basis

## Method for Contributions

Contributions required to fund the plan benefits are determined according to the entry age normal cost method. Under this method, the normal cost for each active participant is the annual amount required from entry age to assumed retirement age to fund his actuarial present value of projected benefits. The actuarial accrued liability is the actuarial present value of projected benefits for all participants minus the actuarial present value of future normal costs. The excess of the actuarial accrued liability over the actuarial value of assets is the unfunded actuarial accrued liability.

## Method for Accrued Benefits

The actuarial present value of accumulated plan benefits is a measure of plan benefits that have been earned to date. This is not only a valuation of retirement benefits, but also of deferred vested, death, and disability benefits. Earnings and service for benefit purposes expected to be earned after the valuation date are excluded from this value.

The actuarial assumptions used to determine this value are identical to those used for the funding purposes.

## Method of Asset Valuation

The asset valuation method is the "smoothed market value (with phase-in)" method, using a smoothing period of 5 years, as described in paragraph 3.16 of IRS Revenue Procedure 2000-40. When fully phased in, the actuarial value of assets will equal the market value of assets with gains subtracted or losses added at the rate described below:

a. 4/5 of the prior year's gain or loss
b. 3/5 of the second preceding year's gain or loss
c. 2/5 of the third preceding year's gain or loss
d. 1/5 of the fourth preceding year's gain or loss

The gain or loss for a year is determined by calculating the difference between the expected value of assets for the year and the market value of assets at the valuation date. The expected value of assets for the year is market value of assets at the prior-year valuation date brought forward with interest at the valuation interest rate to the current valuation date, plus contributions minus benefit disbursements (benefits and expenses), all adjusted with interest at the valuation rate to the current valuation date. If the expected value is less than the market value, the difference is a gain. If the expected value is greater than the market value, there is a loss.

In the first year, the actuarial value of assets is equal to the market value of assets. In subsequent years, the smoothed value is calculated as described above, except that the only gains or losses recognized are those occurring in the year of the change and later. In general, the actuarial value of assets must fall between 80% and 120% of the market value of assets.

## Data

The valuation results are based upon participant census and financial data provided by the plan sponsor. The data was tested for reasonableness and consistency with the prior valuation.

## Actuarial Assumptions

The following actuarial assumptions were employed in the determination of the liabilities and annual contributions of the plan as developed in accordance with the funding methods described in this report.

1. The rates of mortality will be in accordance with the Retired Pensioners Mortality Table (RP-2000) projected to 2017.

2. Interest will be earned at the rate of 7.5% per year.

3. Salary projection assumed to equal the following:

| Year | Percent Increase |
|---|---|
| 2017 & after | 3.0% |

4. Withdrawal prior to retirement is assumed to occur in accordance with Crocker Sarason Straight Table T-7.

5. No disability prior to retirement is assumed.

6. Retirement is assumed to occur in accordance to the following rates:

| Age | Percent Retiring |
|---|---|
| 55 | 15% |
| 56-59 | 3% |
| 60-61 | 10% |
| 62 | 25% |
| 63-64 | 15% |
| 65 | 100% |

7. All plan participants have been included in the funding.

# SECTION 5
# HISTORICAL INFORMATION

| REVENUES BY SOURCE | | | | | |
|---|---|---|---|---|---|
| Fiscal Year | Employee Contributions | Employer Contributions | Investment Income | Miscellaneous | Total |
| 2007 | 2,377,797 | 2,818,972 | 15,708,506 | 19,012 | 20,924,287 |
| 2008 | 2,807,483 | 3,682,478 | (39,088,320) | 85,409 | (32,512,950) |
| 2009 | 2,851,636 | 6,067,903 | 28,532,073 | 472 | 37,452,084 |
| 2010 | 2,842,151 | 4,318,312 | 20,937,248 | 0 | 28,097,711 |
| 2011 | 2,829,980 | 5,187,838 | 2,636,165 | 3,968 | 10,657,951 |
| 2012 | 2,790,857 | 5,897,793 | 20,537,768 | 3474 | 29,229,892 |
| 2013 | 2,844,809 | 6,812,406 | 37,898,762 | 0 | 47,555,977 |
| 2014 | 2,926,661 | 5,580,680 | 14,606,211 | 1,226 | 23,114,778 |
| 2015 | 3,057,133 | 4,341,227 | 1,465,544 | 0 | 8,863,904 |
| 2016 | 3,244,397 | 4,321,221 | 19,850,979 | 0 | 27,416,597 |

| PAYMENTS BY SOURCE | | | | |
|---|---|---|---|---|
| Fiscal Year | Benefits | Refunds | Administrative/ Investment | Total |
| 2007 | 6,949,393 | 350,970 | 1,015,472 | 8,315,835 |
| 2008 | 6,602,403 | 369,818 | 1,076,697 | 8,048,918 |
| 2009 | 7,967,589 | 174,188 | 861,134 | 9,002,911 |
| 2010 | 8,700,743 | 419,399 | 994,820 | 10,114,962 |
| 2011 | 10,142,131 | 282,138 | 1,070,551 | 11,494,820 |
| 2012 | 9,866,539 | 150,971 | 1,044,986 | 11,062,496 |
| 2013 | 11,144,676 | 218,318 | 1,039,341 | 12,402,335 |
| 2014 | 12,641,440 | 387,728 | 1,071,229 | 14,100,397 |
| 2015 | 13,238,599 | 368,013 | 1,033,298 | 14,639,910 |
| 2016 | 13,937,217 | 438,507 | 944,265 | 15,319,989 |

## SECTION 6
## AGE, SERVICE AND AVERAGE SALARY PROFILE OF THE ACTIVE MEMBERS ON JANUARY 1, 2017

| FULL YEARS OF SERVICE TO JANUARY 1, 2017 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Age** | **0-4** | **5-9** | **10-14** | **15-19** | **20-24** | **25-29** | **30+** | **Total** | **Average Salary** |
| 0-24 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 30,776 |
| 25-29 | 118 | 8 | 0 | 0 | 0 | 0 | 0 | 126 | 33,075 |
| 30-34 | 72 | 57 | 3 | 0 | 0 | 0 | 0 | 132 | 35,585 |
| 35-39 | 58 | 36 | 35 | 3 | 0 | 0 | 0 | 132 | 37,721 |
| 40-44 | 24 | 26 | 39 | 30 | 12 | 0 | 0 | 131 | 42,468 |
| 45-49 | 33 | 26 | 37 | 32 | 26 | 6 | 0 | 160 | 42,995 |
| 50-54 | 27 | 31 | 30 | 22 | 28 | 29 | 12 | 179 | 43,416 |
| 55-59 | 23 | 27 | 26 | 24 | 19 | 15 | 21 | 155 | 43,519 |
| 60-64 | 8 | 17 | 13 | 18 | 11 | 9 | 13 | 89 | 42,458 |
| 65 + | 0 | 6 | 7 | 10 | 9 | 2 | 3 | 37 | 36,449 |
| **Total** | 408 | 234 | 190 | 139 | 105 | 61 | 49 | 1,186 | 39,895 |

**AVERAGE AGE:** 44.9

**AVERAGE SERVICE:** 11.2

# SECTION 7
# DEPOSIT ADMINISTRATOR INFORMATION

Boston Advisors, Inc.

Boyd Watterson Asset Management

Boyd Watterson GSA

Dimension Fund Advisors

Emerald Advisors, Inc.

Europacific Fund

Golden Capital Management

Miller Howard MLP

Multi-Employer Property Trust

PNC

Templeton

Vanguard Funds

Wells Capital

Fiduciary Advisor

Morrison Fiduciary Advisors, Inc.