

Erie County Employees' Retirement System

Actuarial Valuation Report
as of January 1, 2019

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HIGHLIGHTS

This report presents the results of the actuarial valuation of the Erie County Employees' Retirement System as of January 1, 2019. The purpose of this report is to provide a summary of the actuarial position of the Plan as of January 1, 2019 and the contribution for the 2019 plan year, in accordance with the funding standards of Section 6 of Act 96, 1971 of the Commonwealth of Pennsylvania as amended.

Use of this report for any other purpose may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose.

Annual Required Contribution

The Annual Required Contribution for the plan year ending December 31, 2019 is \$5,773,721. See Section 5 for the history of employer contributions.

Funded Status of the Plan

As of January 1, 2019, the ratio of the market value of assets to the actuarial accrued liability is 86%. This percentage compares to 99% on the prior valuation date.

Changes in Plan Provisions

There have been no changes in the plan benefit provisions since the date of the last report. Section 4.1 summarizes the plan provisions used in the valuation.

Changes in Actuarial Assumptions and Methods

The interest rate assumption has been decreased from 7.5% to 7.25% to better reflect the long-term expected rate of return on assets. This change increased the actuarial accrued liability by \$5,873,578 and the annual required contribution by \$610,823. There have been no other changes in the actuarial assumptions since the date of the last report. Section 4.4 summarizes the actuarial assumptions and methods used in the valuation.

Actuarial Experience

During 2018, the Plan experienced an actuarial loss due primarily to investment returns on an actuarial value basis less than anticipated. The investment yield on an actuarial value basis, net of expenses, was approximately 4.83%. The investment yield on a market value basis, net of expenses, was approximately -5.47%.

Financial and Census Data

The valuation is based on participant data and asset information which was provided by the County. The data has been reviewed and determined to be reasonable and consistent with the prior year's information. An audit of the data was beyond the scope of the assignment. The results of this valuation are dependent on the accuracy of the data.

Section 3 provides a summary of the data used in the valuation.

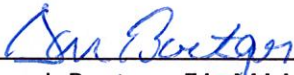
Certification

In our opinion, this report presents fairly the financial and actuarial position for the Erie County Employees' Retirement System as of January 1, 2019 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.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements, such as the end of an amortization period; and changes in plan provisions, applicable law or regulations. An analysis of the potential range of future results is beyond the scope of this valuation.

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.

April, 2019



Don J. Boetger, EA, MAAA, FSPA
Actuary and Consultant



Cynthia A. Marzka, ASA, EA, MAAA
Actuary and Consultant

SECTION 1

FINANCIAL SUMMARY

		<u>January 1, 2018</u>	<u>January 1, 2019</u>
1.	Assets		
	(a) Actuarial Value	\$ 260,279,239	\$ 263,543,089
	(b) Market Value	267,705,542	244,219,794
2.	Approximate Yield During Prior Year		
	(a) Actuarial Value Basis (Net)	9.06%	4.83%
	(b) Market Value Basis	14.09%	(5.19%)
3.	Present Value of Projected Benefits	\$ 291,249,665	\$ 306,432,459
4.	Actuarial Accrued Liability	\$ 270,054,969	\$ 284,163,153
5.	Unfunded Actuarial Accrued Liability	\$ 9,775,730	\$ 20,620,064
6.	Annual Required Contribution		
	(a) Normal Cost	\$ 2,788,538	\$ 2,984,107
	(b) Payment of UAAL	<u>1,572,056</u>	<u>2,789,614</u>
	(c) Total	\$ 4,360,594	\$ 5,773,721
7.	Interest Rate	7.50%	7.25%
8.	Number of Members		
	(a) Active	1,202	1,193
	(b) Inactive	79	91
	(c) Terminated Vested	160	167
	(d) Retirees	736	773
	(e) Beneficiaries	<u>19</u>	<u>23</u>
	(f) Total	2,196	2,247
9.	Annual Compensation	\$ 47,048,703	\$ 51,001,412

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 2018 AND 2017 CALENDAR YEARS		
Additions		
	2018 Total	2017 Total
Contributions		
County	\$ 4,360,594	\$ 4,642,134
Plan Members	<u>3,661,589</u>	<u>3,472,718</u>
Total Contributions	8,022,183	8,114,852
Investment Income		
Net Appreciation/Depreciation in Fair Value of Investments	(33,235,478)	13,004,583
Interest	1,792,809	1,853,792
Dividends	5,679,660	5,426,650
Realized Capital Gains	12,015,534	13,162,861
Loss Recovery	17,722	26,893
Securities Lending	82,157	119,820
Less Investment Expense	<u>740,132</u>	<u>721,986</u>
Net Investment Income	(14,387,728)	32,872,613
Total Additions	(6,365,545)	40,987,465
Deductions		
Benefits	16,429,494	15,657,116
Refunds of Contributions	502,211	202,395
Administrative Expense	<u>188,498</u>	<u>197,630</u>
Total Deductions	17,120,203	16,057,141
Net Increase	(23,485,748)	24,930,324
Net Assets Held in Trust For Pension Benefits		
Beginning of Year	267,705,542	242,775,218
End of Year	\$ 244,219,794	\$ 267,705,542

ERIE COUNTY EMPLOYEES' RETIREMENT PLAN		
PLAN ASSETS AS OF DECEMBER 31, 2018 AND 2017		
Assets		
	2018	2017
Cash and Short-Term Investments	\$ 3,723,841	\$ 2,974,833
Receivables	0	307
Investments, at fair value		
U.S. Government Obligations	\$ 16,714,360	\$ 21,952,922
Domestic Corporate Bonds	22,991,645	26,307,064
Domestic Common Stocks	55,679,610	70,643,355
Mutual Funds- Fixed	19,116,815	13,914,649
Mutual Funds - Equity	77,275,196	89,809,994
Exchange-Traded Funds	307,253	215,391
Private Equity	10,439,124	0
Property Trust	25,564,566	27,732,071
Master Limited Partnership	7,204,423	8,490,290
Other Fixed Income	4,775,976	5,152,870
Accrued Income	427,584	511,796
Total Investments	\$ 240,496,552	\$ 264,730,402
Total Assets	\$ 244,220,393	\$ 267,705,542
Liabilities		
Refunds Payable and Other	599	0
Net Assets Held In Trust For Pension Benefits		
	\$ 244,219,794	\$ 267,705,542

Section 2.2

Approximate Rate of Return

APPROXIMATE RATE OF RETURN FOR 2018 PLAN YEAR (MARKET VALUE)	
1.) Market Value as of December 31, 2017	\$ 267,705,542
2.) Contributions Received During Year	8,022,183
3.) Benefits and Expenses Paid During Year	17,860,335
4.) Market Value as of December 31, 2018	244,219,794
5.) Non-Investment Increment: (2) – (3)	(9,838,152)
6.) Investment Increment: (4) – (1) – (5)	(13,647,596)
7.) Time Weighted Value of Assets: (1) + .5(5)	262,786,466
8.) Approximate Rate of Return for 2018: (6) / (7)	(5.19%)

HISTORY OF RATE OF RETURNS	
Plan Year	Rate of Return
2017	14.09%
2016	8.75%
2015	0.63%
2014	6.50%
2013	19.85%
2012	11.88%
2011	1.52%
2010	13.46%
2009	22.21%
2008	-23.17%

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

	<u>Expected Value</u>
Market Value at Beginning of Year	\$ 267,705,542
Interest Expected Using Valuation Assumption	20,077,916
Plus Actual Contributions	8,022,183
Minus Actual Distributions	(17,860,335)
Interest Expected on Contributions and Distributions	<u>(366,520)</u>
Expected Value at End of Year	\$ 277,578,786
Market Value at End of Year	<u>244,219,794</u>
(Gain) or Loss for Year	<u>\$ 33,358,992</u>

Computation of Adjustment

<u>Year</u>	<u>(Gain) or Loss</u>	<u>Adjustment Percent</u>	<u>Adjustment Amount</u>
2018	33,358,992	.80	26,687,194
2017	(15,711,562)	.60	(9,426,937)
2016	(2,840,784)	.40	(1,136,314)
2015	15,996,759	.20	3,199,352
2014	2,243,564	.00	<u>0</u>
Total Adjustment			\$ 19,323,295

Determination of Actuarial Value of Assets

Market Value of Assets	\$ 244,219,794
Adjustment	<u>19,323,295</u>
Actuarial Value of Assets	\$ 263,543,089

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)	\$ 219,797,815
Actuarial Value of Assets	\$ 263,543,089
Upper Limit (120% of Fair Market Value)	\$ 268,641,773

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, 2019. The liabilities were determined from the actuarial valuation of the Plan based upon the data submitted by the County.

ASSETS	
Members' Annuity Reserve Account	\$ 46,150,901
County Annuity Reserve Account	44,100,812
Retired Members' Reserve Account	151,971,757
Unrealized Appreciation in Assets	1,996,324
<i>Total Assets, (Market Value) of the Erie County Employees' Retirement System</i>	\$ 244,219,794
LIABILITIES	
Actuarial Present Value of:	
Accumulated Plan Benefits	
Vested	\$ 52,568,623
Nonvested	2,775,384
Future Benefit Accruals	45,821,908
Terminated Vested Benefits	7,143,886
Retired Benefits	151,971,757
Member Accumulated Deductions	46,150,901
<i>Total Liabilities of the Erie County Employees' Retirement System</i>	\$ 306,432,459

Section 2.5

Normal Cost and Unfunded Actuarial Accrued Liability

This Section shows the Normal Cost and Unfunded Actuarial Accrued Liability for 2019 for the Erie County Employees' Retirement System.

Normal Cost for 2019	
a. Retirement Benefits	\$ 2,201,146
b. Termination Benefits	747,980
c. Death Benefits	<u>34,981</u>
Total Normal Cost	\$ 2,984,107

Unfunded Actuarial Accrued Liability as of January 1, 2019	
1. Active Participants	
a. Retirement Benefits	\$ 73,530,624
b. Termination Benefits	4,426,618
c. Death Benefits	<u>939,367</u>
d. Total	\$ 78,896,609
2. Terminated Vested Participants	\$ 7,143,886
3. Retired Members and Beneficiaries	
a. Retirement Benefits	\$ 149,972,164
b. Cost of Living Benefits	<u>1,999,593</u>
c. Total	\$ 151,971,757
4. Member Accumulated Deductions	<u>\$ 46,150,901</u>
5. Total Actuarial Accrued Liability	\$ 284,163,153
6. Actuarial Value of Assets	<u>\$ 263,543,089</u>
7. Unfunded Actuarial Accrued Liability	\$ 20,620,064

Section 2.6

Annual Required Contribution

This Section shows the development of the amortization payment and the calculation of the Annual Required Contribution for 2019.

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

<u>Source</u>	<u>Initial Liability</u>	<u>Effective Date</u>	<u>Remaining Period</u>	<u>Outstanding Balance</u>	<u>Amortization Charge</u>
Initial Liability	\$ 14,061,142	1/1/2015	7 Years	\$ 10,180,718	\$ 1,776,748
Actuarial Gain	(473,814)	1/1/2016	7 Years	(378,360)	(66,032)
Actuarial Gain	(550,668)	1/1/2017	8 Years	(469,899)	(74,086)
Actuarial Gain	(2,786,442)	1/1/2018	9 Years	(2,589,479)	(374,534)
Assump. Change	2,233,873	1/1/2018	9 Years	2,075,970	300,261
Actuarial Loss	5,927,536	1/1/2019	15 Years	5,927,536	616,434
Assump. Change	5,873,578	1/1/2019	15 Years	<u>5,873,578</u>	<u>610,823</u>
Total				\$ 20,620,064	\$ 2,789,614

The Annual Required Contribution is calculated by adding the Normal Cost Component and the Total Amortization Charge. For 2019, the Annual Required Contribution is determined to be \$5,773,721.

Development of the Annual Required Contribution for 2019	
1. Normal Cost Component	\$ 2,984,107
2. Amortization Payment	<u>2,789,614</u>
3. Annual Required Contribution for 2019	\$ 5,773,721

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 \$46,150,901 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, 2019. Since these accumulations represent the present value as of January 1, 2019 of future benefits, the reserve balance and liability are identical.

**County Annuity
Reserve Account:**

The balance of \$46,097,136 in this account as of January 1, 2019 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, 2019 amount to \$151,971,757. 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 1/1/18	\$ 46,129,130	\$ 47,579,973	\$138,764,637	\$ 232,473,740
Member Contributions	3,638,503	23,086	0	3,661,589
County Appropriations	0	4,360,594	0	4,360,594
Net Investment Income	0	19,587,882	0	19,587,882
Miscellaneous Income	0	0	0	0
Active Death Refunds	0	0	0	0
Member Contributions Refunded	(502,211)	0	(813,868)	(1,316,079)
Pension Payments	0	0	(14,708,876)	(14,708,876)
Death Benefits	(251,914)	(402,180)	(252,656)	(906,750)
Retiree and Death Benefit Transfers	(4,632,584)	(10,429,249)	15,061,833	0
Cost-of-Living Funding Requirement	0	0	0	0
Administrative Expenses	0	(188,498)	0	(188,498)
Investment Expenses	0	(740,132)	0	(740,132)
Balance Before Interest	44,380,924	59,791,476	138,051,070	242,223,470
Interest Allocated in 2018	1,769,977	(12,150,566)	10,380,589	0
Balance Before Actuarial Adjustments	46,150,901	47,640,910	148,431,659	242,223,470
Actuarial Adjustments	0	(3,540,098)	3,540,098	0
Ending Balance 1/1/19	46,150,901	44,100,812	151,971,757	242,223,470
Unrealized Appreciation	0	1,996,324	0	1,996,324
Assets (Market Value) 1/1/19	46,150,901	46,097,136	151,971,757	244,219,794

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
2019	573	787	1360	272	524	796
2018	570	792	1,362	267	488	755
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

Section 3.2

Changes in Plan Membership from January 1, 2018 to January 1, 2019

Shown below are the changes that occurred in plan members during the prior plan year.

	<u>Active</u>	<u>Terminated Vested</u>	<u>Terminated Nonvested</u>	<u>Retired</u>	<u>Benef.</u>	<u>Total</u>
Members at Prior Valuation Date	1,202	160	79	736	19	2,196
New Members	135	-	-	-	-	135
Rehires	10	(2)	(3)	(1)	-	4
Terminated Without Vesting	(73)	-	73	-	-	-
Terminated Vested	(29)	29	-	-	-	-
Became Inactive	-	-	-	-	-	-
Retired	(51)	(8)	-	59	-	-
Deaths	(1)	(1)	-	(19)	-	(21)
Payments Begin to Beneficiary	-	-	-	-	4	4
Payments Begin Due To Domestic Relations Order	-	-	-	1	-	1
Distributions	-	(11)	(58)	(3)	-	(72)
Data Correction	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Members at Current Valuation Date	1,193	167	91	773	23	2,247

Section 3.3

Age, Service and Average Salary of the Active Members as of January 1, 2019

FULL YEARS OF SERVICE TO JANUARY 1, 2019									
Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Total	Average Salary
0-24	47	0	0	0	0	0	0	47	33,014
25-29	155	8	0	0	0	0	0	163	36,129
30-34	75	45	7	0	0	0	0	127	38,678
35-39	48	38	45	5	0	0	0	136	40,846
40-44	42	19	33	22	3	0	0	119	43,061
45-49	36	23	34	33	31	5	0	162	45,044
50-54	27	20	34	29	15	28	12	165	47,569
55-59	19	19	24	27	18	16	17	140	43,695
60-64	10	14	20	20	6	7	11	88	44,430
65 +	7	5	7	12	9	3	3	46	38,705
Total	466	191	204	148	82	59	43	1,193	41,899

AVERAGE AGE: 44.4

AVERAGE SERVICE: 10.8

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: A monthly pension equal to (a) and (b), as follows:

(a) 1.667% of 1/12th of Final "Average" Salary multiplied by years of credited service,

-- 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.

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 superannuation (Normal Retirement) age and after completion of five years of credited service.

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 or 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.

(a) 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:

<u>PERCENTAGE CHANGE IN C.P.I.</u>	<u>EFFECTIVE DATE OF INCREASE</u>
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
100%	1/1/17

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.

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 2019.
2. Interest will be earned at the rate of 7.25% per year.
3. Salary projection assumed to equal the following:

<u>Year</u>	<u>Percent Increase</u>
2019 & 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:

<u>Age</u>	<u>Percent Retiring</u>
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
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
2017	3,472,718	4,642,134	33,594,599	0	41,709,451
2018	3,661,589	4,360,594	(13,647,596)	0	(5,625,413)

PAYMENTS BY SOURCE				
Fiscal Year	Benefits	Refunds	Administrative/ Investment	Total
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
2017	15,657,116	202,395	919,616	16,779,127
2018	16,429,494	502,211	928,630	17,860,335

SECTION 6

DEPOSIT ADMINISTRATOR INFORMATION

Boston Advisors, Inc.
Boyd Watterson Asset Management
Boyd Watterson GSA
Dimensional Fund Advisors
Emerald Advisors, Inc.
Europacific Fund
Golden Capital Management
Ironsides Direct Investment Fund
Miller Howard MLP
Multi-Employer Property Trust
PNC
Portfolio Advisors Credit Strategies Fund
Portfolio Advisors Co-Investment Fund III
Vanguard Funds
Wells Capital

Fiduciary Advisor
Morrison Fiduciary Advisors, Inc.