Erie County
Employees' Retirement System

Actuarial Valuation Report
as of January 1, 2020

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Contents of Report

HIGHLIGHTS

This report presents the results of the actuarial valuation of the Erie County Employees' Retirement System as of January 1, 2020. The purpose of this report is to provide a summary of the actuarial position of the Plan as of January 1, 2020 and the contribution for the 2020 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.

Actuarially Determined Contribution

The Actuarially Determined Contribution for the plan year ending December 31, 2020 is $6,397,197. See Section 5 for the history of employer contributions.

Funded Status of the Plan

As of January 1, 2020, the ratio of the market value of assets to the actuarial accrued liability is 95%. This percentage compares to 86% 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

There have been no 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 2019, 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 6.16%. The investment yield on a market value basis, net of expenses, was approximately 18.09%.

Financial and Census Data

The valuation is based on member 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, 2020 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.

Don Boetger

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

4/15/2020
Date

Cynthia A. Marzka

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

4/15/2020
Date

SECTION 1
FINANCIAL SUMMARY

			January 1, 2019	January 1, 2020
1.	Assets			
	(a)	Actuarial Value	$ 263,543,089	$ 271,410,971
	(b)	Market Value	244,219,794	279,549,104
2.	Approximate Yield During Prior Year			
	(a)	Actuarial Value Basis (Net)	4.83%	6.16%
	(b)	Market Value Basis	(5.19%)	18.35%
3.	Present Value of Projected Benefits		$ 306,432,459	$ 318,360,175
4.	Actuarial Accrued Liability		$ 284,163,153	$ 295,160,762
5.	Unfunded Actuarial Accrued Liability		$ 20,620,064	$ 23,749,791
6.	Actuarially Determined Contribution			
	(a) Normal Cost		$ 2,984,107	$ 3,126,436
	(b) Payment of UAAL		2,789,614	3,270,761
	(c) Total		$ 5,773,721	$ 6,397,197
7.	Interest Rate		7.25%	7.25%
8.	Number of Members			
	(a)	Active	1,193	1,193
	(b)	Inactive	91	62
	(c)	Terminated Vested	167	167
	(d)	Retirees	773	821
	(e)	Beneficiaries	23	22
	(f)	Total	2,247	2,265
9.	Annual Compensation		$ 51,001,412	$ 52,482,730

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 2019 AND 2018 CALENDAR YEARS		
Additions		
	2019 Total	**2018 Total**
Contributions		
County	$ 5,773,721	$ 4,360,594
Plan Members	3,886,103	3,661,589
Total Contributions	9,659,824	8,022,183
Investment Income		
Net Appreciation/Depreciation in Fair Value of Investments	23,189,042	(33,235,478)
Interest	1,444,277	1,792,809
Dividends	5,202,499	5,679,660
Realized Capital Gains	14,079,598	12,015,534
Loss Recovery	32,886	17,722
Securities Lending	62,272	82,157
Less Investment Expense	570,403	740,132
Net Investment Income	43,440,171	(14,387,728)
Total Additions	53,099,995	(6,365,545)
Deductions		
Benefits	16,823,461	16,429,494
Refunds of Contributions	728,736	502,211
Administrative Expense	218,488	188,498
Total Deductions	17,770,685	17,120,203
Net Increase	35,329,310	(23,485,748)
Net Assets Held in Trust for Pension Benefits		
Beginning of Year	244,219,794	267,705,542
End of Year	$ 279,549,104	$ 244,219,794

ERIE COUNTY EMPLOYEES' RETIREMENT PLAN

PLAN ASSETS AS OF DECEMBER 31, 2019 AND 2018

	2019	2018
Assets		
Cash and Short-Term Investments	$ 2,295,482	$ 3,723,841
Receivables	0	0
Investments, at fair value		
U.S. Government Obligations	$ 24,386,696	$ 16,714,360
Domestic Corporate Bonds	21,956,733	22,991,645
Domestic Common Stocks	39,248,808	55,679,610
Mutual Funds- Fixed	27,169,705	19,116,815
Mutual Funds - Equity	113,060,255	77,275,196
Exchange-Traded Funds	389,156	307,253
Private Equity	16,981,099	10,439,124
Property Trust	21,235,821	25,564,566
Master Limited Partnership	9,260,503	7,204,423
Other Fixed Income	3,071,377	4,775,976
Accrued Income	493,468	427,584
Total Investments	$ 277,253,621	$ 240,496,552
Total Assets	$ 279,549,103	$ 244,220,393
Liabilities		
Refunds Payable and Other	0	599
Net Assets Held In Trust For Pension Benefits		
	$ 279,549,103	$ 244,219,794

Section 2.2

Approximate Rate of Return

APPROXIMATE RATE OF RETURN FOR 2019 PLAN YEAR (MARKET VALUE)	
1.) Market Value as of December 31, 2018	$ 244,219,794
2.) Contributions Received During Year	9,659,824
3.) Benefits and Expenses Paid During Year	18,341,088
4.) Market Value as of December 31, 2019	279,549,104
5.) Non-Investment Increment: (2) – (3)	(8,681,264)
6.) Investment Increment: (4) – (1) – (5)	44,010,574
7.) Time Weighted Value of Assets: (1) + .5(5)	239,879,162
8.) Approximate Rate of Return for 2019: (6) / (7)	18.35%

HISTORY OF RATE OF RETURNS

Plan Year	Rate of Return
2018	(5.19%)
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%

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	$ 244,219,794
Interest Expected Using Valuation Assumption	17,705,935
Plus Actual Contributions	9,659,824
Minus Actual Distributions	(18,341,088)
Interest Expected on Contributions and Distributions	(321,293)
Expected Value at End of Year	$ 252,923,172
Market Value at End of Year	279,549,104
(Gain) or Loss for Year	$ (26,625,932)

Computation of Adjustment

Year	(Gain) or Loss	Adjustment Percent	Adjustment Amount
2019	(26,625,932)	.80	(21,300,746)
2018	33,358,992	.60	20,015,395
2017	(15,711,562)	.40	(6,284,625)
2016	(2,840,784)	.20	(568,157)
2015	15,996,759	.00	0
Total Adjustment			$ (8,138,133)

Determination of Actuarial Value of Assets

Market Value of Assets	$ 279,549,104
Adjustment	(8,138,133)
Actuarial Value of Assets	$ 271,410,971

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)	$ 223,639,283
Actuarial Value of Assets	$ 271,410,971
Upper Limit (120% of Fair Market Value)	$ 335,458,925

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, 2020. The liabilities were determined from the actuarial valuation of the Plan based upon the data submitted by the County.

ASSETS	
Members' Annuity Reserve Account	$ 46,200,074
County Annuity Reserve Account	45,340,850
Retired Members' Reserve Account	162,822,814
Unrealized Appreciation in Assets	25,185,366
Total Assets, (Market Value) of the Erie County Employees' Retirement System	$ 279,549,104
LIABILITIES	
Actuarial Present Value of:	
Accumulated Plan Benefits	
Vested	$ 53,233,597
Nonvested	2,794,761
Future Benefit Accruals	46,867,828
Terminated Vested Benefits	6,441,101
Retired Benefits	162,822,814
Member Accumulated Deductions	46,200,074
Total Liabilities of the Erie County Employees' Retirement System	$ 318,360,175

Section 2.5

Normal Cost and Unfunded Actuarial Accrued Liability

This Section shows the Normal Cost and Unfunded Actuarial Accrued Liability for 2020 for the Erie County Employees' Retirement System.

Normal Cost for 2020	
a. Retirement Benefits	$ 2,324,979
b. Termination Benefits	765,181
c. Death Benefits	36,276
Total Normal Cost	$ 3,126,436

Unfunded Actuarial Accrued Liability as of January 1, 2020		
1.	Active Members	
	a. Retirement Benefits	$ 74,279,204
	b. Termination Benefits	4,487,526
	c. Death Benefits	930,043
	d. Total	$ 79,696,773
2.	Terminated Vested Members	$ 6,441,101
3.	Retired Members and Beneficiaries	
	a. Retirement Benefits	$ 160,915,703
	b. Cost of Living Benefits	1,907,111
	c. Total	$ 162,822,814
4.	Member Accumulated Deductions	$ 46,200,074
5.	Total Actuarial Accrued Liability	$ 295,160,762
6.	Actuarial Value of Assets	$ 271,410,971
7.	Unfunded Actuarial Accrued Liability	$ 23,749,791

Section 2.6

Actuarially Determined Contribution

This Section shows the development of the amortization payment and the calculation of the Actuarially Determined Contribution for 2020.

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

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	6 Years	$ 9,013,258	$ 1,776,748
Actuarial Gain	(473,814)	1/1/2016	6 Years	(334,972)	(66,032)
Actuarial Gain	(550,668)	1/1/2017	7 Years	(424,509)	(74,086)
Actuarial Gain	(2,786,442)	1/1/2018	8 Years	(2,375,529)	(374,534)
Assump. Change	2,233,873	1/1/2018	8 Years	1,904,448	300,261
Actuarial Loss	5,927,536	1/1/2019	14 Years	5,696,157	616,434
Assump. Change	5,873,578	1/1/2019	14 Years	5,644,305	610,823
Actuarial Loss	4,626,633	1/1/2020	15 Years	4,626,633	481,147
Total				$ 23,749,791	$ 3,270,761

The Actuarially Determined Contribution is calculated by adding the Normal Cost Component and the Total Amortization Charge. For 2020, the Actuarially Determined Contribution is determined to be $6,397,197.

Development of the Actuarially Determined Contribution for 2020	
1. Normal Cost Component	$ 3,126,436
2. Amortization Payment	3,270,761
3. Actuarially Determined Contribution for 2020	$ 6,397,197

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 $46,200,074 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, 2020. Since these accumulations represent the present value as of January 1, 2020 of future benefits, the reserve balance and liability are identical.

County Annuity Reserve Account:

The balance of $70,526,216 in this account as of January 1, 2020 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, 2020 amount to $162,822,814. 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 1/1/19	$ 46,150,901	$ 44,100,812	$151,971,757	$ 242,223,470
Member Contributions	3,849,566	36,537	0	3,886,103
County Appropriations	0	5,773,721	0	5,773,721
Net Investment Income	0	20,821,532	0	20,821,532
Miscellaneous Income	0	0	0	0
Active Death Refunds	0	0	0	0
Member Contributions Refunded	(728,736)	0	(977,146)	(1,705,882)
Pension Payments	0	0	(15,773,939)	(15,773,939)
Death Benefits	(19,021)	0	(53,355)	(72,376)
Retiree and Death Benefit Transfers	(4,860,757)	(10,102,990)	14,963,747	0
Cost-of-Living Funding Requirement	0	0	0	0
Administrative Expenses	0	(218,488)	0	(218,488)
Investment Expenses	0	(570,403)	0	(570,403)
Balance Before Interest	44,391,953	59,840,721	150,131,064	254,363,738
Interest Allocated in 2019	1,808,121	(12,759,348)	10,951,227	0
Balance Before Actuarial Adjustments	46,200,074	47,081,373	161,082,291	254,363,738
Actuarial Adjustments	0	(1,740,523)	1,740,523	0
Ending Balance 1/1/20	46,200,074	45,340,850	162,822,814	254,363,738
Unrealized Appreciation	0	25,185,366	0	25,185,366
Assets (Market Value) 1/1/20	46,200,074	70,526,216	162,822,814	279,549,104

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
2020	577	783	1,360	290	553	843
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

Section 3.2

Changes in Plan Membership from January 1, 2019 to January 1, 2020

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

	Active	Terminated Vested	Terminated Nonvested	Retired	Benef.	Total
Members at Prior Valuation Date	1,193	167	91	773	23	2,247
New Members	164	-	-	-	-	164
Rehires	5	(2)	-	-	-	3
Terminated Without Vesting	(93)	-	93	-	-	-
Terminated Vested	(33)	33	-	-	-	-
Became Inactive	-	-	-	-	-	-
Retired	(42)	(17)	-	59	-	-
Deaths	(1)	-	-	(10)	(1)	(12)
Payments Begin to Beneficiary	-	-	-	-	-	-
Payments Begin Due To Domestic Relations Order	-	-	-	-	-	-
Distributions	-	(14)	(122)	(1)	-	(137)
Data Correction	-	-	-	-	-	-
Members at Current Valuation Date	1,193	167	62	821	22	2,265

Section 3.3

Age, Service and Average Salary of the Active Members as of January 1, 2020

FULL YEARS OF SERVICE TO JANUARY 1, 2020									
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**	**Total**	**Average Salary**
0-24	48	0	0	0	0	0	0	48	34,281
25-29	147	10	0	0	0	0	0	157	38,063
30-34	85	51	3	0	0	0	0	139	40,114
35-39	48	36	39	8	0	0	0	131	41,697
40-44	41	24	30	27	3	0	0	125	43,911
45-49	38	30	28	33	23	10	0	162	46,025
50-54	29	16	27	29	23	28	9	161	47,998
55-59	17	19	30	21	18	13	16	134	45,586
60-64	9	15	25	25	9	8	10	101	46,094
65 +	7	6	5	2	7	3	5	35	43,513
Total	469	207	187	145	83	62	40	1,193	43,268

AVERAGE AGE: **44.3**

AVERAGE SERVICE: **10.6**

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 member 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 member 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:

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
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 member 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 members 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 member 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 2020.

2. Interest will be earned at the rate of 7.25% per year.

3. Salary projection assumed to equal the following:

Year	Percent Increase
2020 & 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 4.5

Description of Risk Exposures

Valuations are performed on certain basic set of pre-determined assumptions and other regulatory framework which may vary over time. Thus, the County is exposed to various risks in providing the pension benefit, which are as follows:

Asset Liability Mismatching or Market Risk: The duration of the liability is longer compared to duration of assets, exposing the County to market risk for volatilities/fall in interest rates.

Demographic Risk: The County has used certain mortality and attrition assumptions in valuation of the liability. The County is exposed to the risk of actual experience turning out to be worse compared to the assumption.

Interest Rate Risk: The Plan exposes the County to the risk of fall in interest rates. A fall in interest rates will result in an increase in the ultimate cost of providing the benefit and will thus result in an increase in value of the liability.

Investment Risk: The probability or likelihood of occurrence of losses relative to the expected return on any particular investment.

Liquidity Risk: This is the risk that the County is not able to meet the short-term pension payouts. This may arise due to non-availability of enough cash/cash equivalents to meet the liabilities or holding of illiquid assets not being sold in time.

Regulatory Risk: Pension benefit is paid in accordance with the requirements of Act 96, as amended from time to time. There is a risk of change in regulations requiring higher pension contributions.

Note: The above is a standard list of risk exposures in providing the pension benefit. The County is advised to carefully examine the above list and make suitable amendments, if relevant.

REVENUES BY SOURCE					
Fiscal Year	Employee Contributions	Employer Contributions	Investment Income	Miscellaneous	Total
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)
2019	3,886,103	5,773,721	44,010,574	0	53,670,398

PAYMENTS BY SOURCE				
Fiscal Year	Benefits	Refunds	Administrative/ Investment	Total
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
2019	16,823,461	728,736	788,891	18,341,088

SECTION 6
DEPOSIT ADMINISTRATOR INFORMATION

Boyd Watterson

Dimensional Fund Advisors

Emerald Advisors, Inc.

Europacific Fund

Ironsides

Miller Howard MLP

Multi-Employer Property Trust

PNC

Portfolio Advisors

Vanguard Funds

Wells Capital

Fiduciary Advisor

Morrison Fiduciary Advisors, Inc.