



KORN FERRY

Beaver County Employees' Retirement System

Report on 2019 Actuarial Valuation Including
Determination of County Actuarially Determined
Contribution for 2019





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for

Beaver County Employees' Retirement Board

Daniel Camp	Commissioner, Chairman
Sandie Egley	Commissioner
Tony Amadio	Commissioner
David A. Rossi	Controller/Secretary
Connie T. Javens	Treasurer

June 17, 2019



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I. Introduction

The primary purpose of this report is to investigate and fully and fairly disclose the actuarial position of the Beaver County Employees' Retirement System as of January 1, 2019 and to establish the proper appropriation 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.

On the basis of the actuarial methods, assumptions and major plan provisions summarized in this report and in reliance on the member data and statement of the Fund's assets furnished by the County, to the best of our knowledge the information in this report is complete and accurate.

To the best of our knowledge, this report is complete and accurate and all costs and liabilities have been determined in conformance with generally accepted actuarial principles, Pennsylvania State Law, Act 44 and on the basis of actuarial assumptions and methods which are reasonable (taking into account past experience under the plan and reasonable expectations) and which represent our best estimate of anticipated experience under the plan.

The included measurements are based on a single set of assumptions regarding the future experience of the plan's investments and participants. Future measurements and funding needs of the plan could vary significantly based on the actual experience, including differences in investment performance, and any changes in the future expectations. Estimates of the potential impact of changes in the plan's assets and liabilities are included in Schedule O.

Respectfully submitted,

Korn Ferry (US)

By: *Henry E. Stiehl*

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II. Findings

Certified Actuarially Determined Contribution

Please note that the certified actuarially determined contribution which is reported on page 12 of this report and which must be funded in 2019 is \$1,848,555. This amount is required to ensure that the fund accumulates sufficient assets to pay future benefits and should be paid by the County from the General Fund.

Actuarial Adjustments

Also note that the balances in the Reserve Accounts on page 8 reflect the following transfers which are necessary to keep the balance in the Retired Member's Reserve Account equal to the liability for the retired lives and to reflect the difference between the amount of interest credited to the respective reserves and the interest rate assumed in the valuation of the liabilities. Please make these transfers in your records:

	DEBIT	CREDIT
County Annuity Reserve Account	\$ 5,375,971.84	
Retired Members Annuity Reserve Account		\$ 5,375,971.84



III. Schedules

Schedule A

BEAVER COUNTY EMPLOYEES' RETIREMENT SYSTEM

CHANGES IN PLAN NET ASSETS FOR THE CALENDAR YEAR 2018 AND 2017

	Additions	
	<u>2018 Total</u>	<u>2017 Total</u>
Contributions		
County	\$ 1,240,109.00	\$ 1,999,290.00
Plan Members	\$ 3,868,685.89	\$ 3,608,537.99
Miscellaneous	\$ 51,767.74	\$ 843,973.32
Total Contributions	\$ <u>5,160,562.63</u>	\$ <u>6,451,801.31</u>
Investment Income		
Realized Gain	\$ <u>20,403,512.68</u>	
Unrealized Loss	\$ <u>(38,772,273.06)</u>	
Net Loss in Fair Value	\$ (18,368,760.38)	\$ 32,056,882.11
Interest	\$ 1,420,601.60	\$ 1,586,267.28
Dividends	\$ 5,220,817.22	\$ 3,507,991.51
Net Accrued Interest	\$ 85,455.12	\$ 69,527.80
Investment Income	\$ <u>(11,641,886.44)</u>	\$ <u>37,220,668.70</u>
Less Investment Expense	\$ 924,585.84	\$ 910,724.73
Net Investment Income	\$ <u>(12,566,472.28)</u>	\$ <u>36,309,943.97</u>
Total Additions	\$ <u>(7,405,909.65)</u>	\$ <u>42,761,745.28</u>
	Deductions	
Benefits	\$ 16,860,973.08	\$ 17,380,673.76
Refunds of Member Contributions	\$ 333,880.70	\$ 394,554.85
Administrative Expense	\$ 187,881.42	\$ 206,161.81
Miscellaneous	\$ 50,924.16	\$ 0.00
Total Deductions	\$ <u>17,433,659.36</u>	\$ <u>17,981,390.42</u>
Net Increase/(Decrease)	\$ <u>(24,839,569.01)</u>	\$ <u>24,780,354.86</u>
	Net Assets Held In Trust For Pension Benefits	
Beginning of Year	\$ <u>301,871,774.88</u>	\$ <u>277,091,420.02</u>
End of Year	\$ <u>277,032,205.87</u>	\$ <u>301,871,774.88</u>



Schedule A – Continued

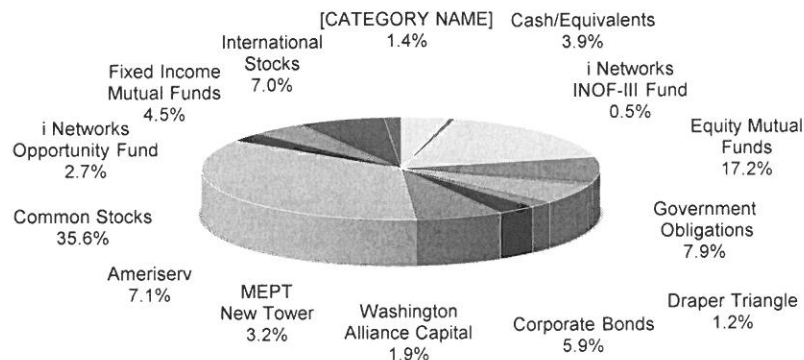
BEAVER COUNTY EMPLOYEES' RETIREMENT SYSTEM PLAN ASSETS AS OF DECEMBER 31, 2018 AND 2017

	Assets	
	2018 Total	2017 Total
Cash and Short-Term Investments	\$ 10,454,621.52	\$ 9,475,046.85
Receivables	\$ 422,787.96	\$ 655,324.05
Investments, at fair market value		
Government Obligations	\$ 21,927,889.75	\$ 22,098,857.95
Corporate Bonds	\$ 16,485,406.51	\$ 20,290,489.35
Common Stocks	\$ 98,785,696.08	\$ 130,385,641.54
Ameriserv	\$ 19,606,081.80	\$ 17,822,281.49
Equity Mutual Funds	\$ 47,688,817.31	\$ 41,792,274.16
Collateralized Mortgage	\$ 3,971,850.67	\$ 4,433,524.29
International Stocks	\$ 19,379,840.41	\$ 22,022,110.49
Fixed Income Mutual Funds	\$ 12,467,205.05	\$ 9,605,680.63
Washington Alliance Capital	\$ 5,241,230.00	\$ 4,483,685.17
Altair Management Partners	\$ 104,321.00	\$ 2,139,309.00
iNetworks Opportunity Fund	\$ 7,348,319.00	\$ 5,133,181.46
iNetworks INOF-III Fund	\$ 1,344,675.00	\$ 1,066,479.07
Draper Triangle	\$ 3,287,826.00	\$ 2,388,914.00
MEPT New Tower	\$ 8,848,202.66	\$ 8,251,395.48
Total Investments	\$ 266,487,361.24	\$ 291,913,824.08
 Total Assets	\$ 277,364,770.72	\$ 302,044,194.98
Liabilities		
Refunds Payable and Other	\$ 332,564.85	\$ 172,420.10

Net Assets Held In Trust For Pension Benefits

\$ 277,032,205.87 \$ 301,871,774.88

TOTAL ASSETS (MARKET VALUE 12-31-2018)





Schedule A - Continued

Beaver County Employees' Retirement System

Plan Description and Contribution Information

Basis of Accounting: The Beaver County Employees' Retirement System financial statements are prepared using the accrual basis of accounting. Plan member contributions are recognized in the period in which the contributions are due. Employer contributions to each plan are recognized when due and the employer has made a formal commitment to provide the contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of each plan.

Method Used to Value Investments: Investments are reported at fair value. Short-term investments are reported at cost, which approximates fair value. Securities traded on a national or international exchange are valued at the last reported sales price at current exchange rates. Investments that do not have an established market are reported at estimated fair value.

Membership of the plan consisted of the following as of January 1, 2019:

Retirees and Beneficiaries Receiving Benefits	1,194
Terminated Plan Members Entitled to but not yet Receiving Benefits	134
Active Plan Members	<u>742</u>
Total	<u><u>2,070</u></u>
Number of Participating Employers	1



Schedule A - Continued

Beaver County Employees' Retirement System

Plan Description: The Beaver County Employees' Retirement Plan is a single-employer defined benefit pension plan that covers all employees of the County. The plan provides retirement, disability, and death benefits to plan members and their beneficiaries. Cost-of-living adjustments (COLA) are provided at the discretion of the Beaver County Employees' Retirement Board. Act 96 of 1971, as amended cited as the County Pension Law provides for the creation, maintenance and operation of this plan.

Contributions: Plan members are required to contribute 9% of their annual covered salary. The County is required to contribute at an actuarially determined rate. Per Act 96 of 1971, as amended, contribution requirements of the plan members and the County are established and may be amended by the General Assembly of the Commonwealth of Pennsylvania. Administrative costs may be financed through investment earnings.

SCHEDULE OF EMPLOYER CONTRIBUTIONS

<u>Year</u>	<u>Contribution *</u>	<u>County Contribution</u>
2009	\$ 5,763,864	\$ 19,227,192
2010	\$ 3,096,622	\$ 3,096,622
2011	\$ 2,286,304	\$ 2,286,304
2012	\$ 3,312,744	\$ 3,312,744
2013	\$ 3,790,653	\$ 3,790,653
2014	\$ 2,286,670	\$ 2,286,670
2015	\$ 1,162,800	\$ 1,162,800
2016	\$ 1,265,160	\$ 1,265,160
2017	\$ 1,999,290	\$ 1,999,290
2018	\$ 1,240,109	\$ 1,240,109

Note: Effective in 2010 the Entry Age Funding Method was used to determine the annual required contribution. Prior to 2010 the Aggregate Method was used.

*Prior to 2014, contribution was described as Annual Required Contribution (ARC). After 2013, contribution was described as actuarially determined contribution (ADC).



Schedule A - Continued

SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) - Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (b-a)/c
1/1/2010	208,234,825	215,326,297	7,091,472	96.7%	55,619,978	12.7%
1/1/2011	231,188,314	229,857,979	(1,330,335)	100.6%	57,849,020	(2.3%)
1/1/2012	236,825,873	244,641,505	7,815,632	96.8%	58,557,985	13.3%
1/1/2013	247,612,166	257,993,406	10,381,240	96.0%	57,388,235	18.1%
1/1/2014	279,801,219	273,633,778	(6,167,441)	102.3%	56,895,011	(10.8%)
1/1/2015	280,466,428	272,636,827	(7,829,601)	102.9%	38,562,973	(20.3%)
1/1/2016	286,108,075	279,382,686	(6,725,389)	102.4%	38,321,452	(17.5%)
1/1/2017	287,748,024	287,941,738	193,714	99.9%	36,846,699	0.5%
1/1/2018	301,871,775	295,119,348	(6,752,427)	102.3%	37,421,428	(18.0%)
1/1/2019	307,748,835	305,802,590	(1,946,245)	100.6%	38,592,138	(5.0%)



Schedule B

Schedule B shows the allocation of the assets among the Fund's reserve accounts (see Schedule I for Determination of Reserve Balances) and the Fund's liabilities as of January 1, 2019. The liabilities were determined from the actuarial valuation of the System based upon the data submitted by the County.

ASSETS

Members' Annuity Reserve Account	\$	65,311,421.65
County Annuity Reserve Account	\$	19,075,795.85
Retired Members' Reserve Account	\$	162,172,096.00
Unrealized Appreciation of Assets	\$	30,472,892.37
<i>Total Assets, (Market Value) of the Beaver County Employees' Retirement Fund</i>	\$	277,032,205.87

LIABILITIES

Actuarial Present Value of:

Accumulated Plan Benefits		
Vested participants (532)	\$	45,648,888
Nonvested participants (210)	\$	660,711
Future Benefit Accruals	\$	36,697,868
Terminated Vested Benefits	\$	8,678,214
Retired Benefits	\$	162,172,096
Member Accumulated Deductions	\$	65,311,422
<i>Total Liabilities of the Beaver County Employees' Retirement Fund</i>	\$	319,169,199



Schedule C

Unfunded Actuarial Liability and Normal Cost

Schedule C shows the development of the unfunded actuarial liability and the normal cost for 2019.

I. Unfunded Actuarial Liability January 1, 2019

1. Actuarial Liability:		
(a) Active Participants		
Retirement Benefits	\$	63,689,388
Termination Benefits		3,756,671
Death Benefits		2,194,799
Total	\$	<u>69,640,858</u>
(b) Terminated Vested Participants	\$	8,678,214
(c) Retired Members and Beneficiaries		
Retirement Benefits	\$	161,570,516
Cost-of-Living Benefits		601,580
Total	\$	<u>162,172,096</u>
(d) Member Accumulated Deductions	\$	<u>65,311,422</u>
(e) Total (a) + (b) + (c) + (d)	\$	305,802,590
2. Actuarial Value of Plan Assets (see page 14)	\$	307,748,835
3. Unfunded Actuarial Liability as of January 1, 2019: (1e) – (2)	\$	<u>(1,946,245)</u>

II. Normal Cost for 2019

1. Normal Cost for:		
(a) Retirement Benefits	\$	1,646,896
(b) Termination Benefits		214,882
(c) Death Benefits		62,910
(d) Normal Cost as of January 1, 2019	\$	<u>1,924,688</u>
(e) Normal Cost with interest to end of year: (d) x 1.075	\$	2,069,040



Schedule D

Actuarial Gain (Loss) for One Year Period Ending December 31, 2018

Schedule D shows the development of the actuarial gain (loss) for the 2018 plan year.

1.	Unfunded Actuarial Liability as of January 1, 2018	\$	(6,752,427)
2.	Normal Cost as of January 1, 2018		1,865,184
3.	Interest at 7.5% Per Year to December 31, 2018 on (1) and (2)		(366,543)
4.	Employer Contributions for the 2018 Plan Year		1,240,109
5.	Change in Unfunded Actuarial Liability Due to Cost of Living Increase to Retirees		0
6.	Change in Unfunded Actuarial Liability Due to Change in Assumptions		<u>0</u>
7.	Expected Unfunded Actuarial Liability as of January 1, 2019: (1) + (2) + (3) - (4) + (5) + (6)		(6,493,895)
8.	Unfunded Actuarial Liability as of January 1, 2019		(1,946,245)
9.	Actuarial Gain (Loss) for 2018 Plan Year: (7) - (8)		(4,547,650)



Schedule E

Amortization Schedule

Schedule E provides a record of the amortization amounts. Actuarial gains (losses) will be amortized over 15 years from the date determined; increases or decreases created by pension plan establishing an unfunded actuarial accrued liability will be amortized over 25 years from the effective establishment date; increases or decreases created by a modification in the benefit plan applicable to active members will be amortized over 15 years beginning with the January 1st coinciding with or next following the effective date of change; increases or decreases created by a modification in the benefit plan applicable to retired members will be amortized over 10 years beginning with the January 1st coinciding with or next following the effective date of change; increases in actuarial accrued liability attributable to the special early retirement provision will be amortized over 5 years beginning with the January 1st coinciding with or next following the end of the early retirement period; and increases or decreases created by changes in actuarial assumptions will be amortized over 15 years from the effective date of change; resetting the unfunded actuarial liability (UAL) due to outstanding balance becoming negative will be amortized over 15 years beginning with the January 1st coinciding with or next following when the outstanding balance becomes negative. When resetting, any previous charges or credits will be considered paid off and eliminated.

Amortization Record for 2019

				As of January 1, 2019	
	<u>Initial Amount</u>	<u>Effective Date</u>	<u>Remaining Period</u>	<u>Outstanding Balance</u>	<u>Amortization Charge or (Credit)</u>
Amortization of Liability for:					
(a) Resetting UAAL	\$ (1,946,245)	1/1/2019	15 Years	<u>\$(1,946,245)</u>	<u>\$(220,485)</u>
(b) Total				<u>\$(1,946,245)</u>	<u>\$(220,485)</u>



Schedule F

Schedule F determines the certified actuarially determined contribution of \$1,848,555 for 2019 for the Beaver County Employees' Retirement System.

1.	Total Amortization Charge/(Credit) (page 11 (b))	\$ (220,485)
2.	Normal Cost with interest to end of year (page 9 II 1(e))	\$ 2,069,040
3.	Total Funding Requirement for 2019 (actuarially determined contribution for 2019): (1) + (2), but not less than 0	\$ 1,848,555

Notes:

The actuarially determined contribution for 2019 as a percentage of the estimated 2019 compensation (\$38,592,138) for active members is 4.79%.

The equivalent normal cost accrual rate to be applied to actual 2018 salaries to determine reimbursable expenses is 4.96%.



Schedule G

The following are notes to Schedules B and I:

Members' Annuity Reserve Account: The balance of \$65,311,421.65 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 \$19,075,795.85 in this account as of January 1, 2019 and the amounts expected to be credited in the future, plus investment earnings, represent the reserves set aside for the payment of the county's share of the retirement allowances.

This is the account out of which regular interest is credited to the member's annuity and retired members' reserve account, administrative expenses may be paid and the pension obligations of the County are funded.

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 \$162,172,096.00. The corresponding liability for those annuitants on the roll is identical.



Schedule G - Continued

Actuarial Value of Assets: In order to reduce the fluctuations in the County normal cost which can result from full recognition of the unrealized appreciation or depreciation of the Fund's securities each year, the value of assets used to determine costs was determined as prescribed by the Pennsylvania State Law, Act 44 by using the greater of the market value of assets as of the valuation date and adjusting the actuarial value of assets as of the prior valuation date: increased by contributions and other deposits except investment income; decreased by benefit payments and administrative expenses or other payments; and credited with interest at 1% less than the plan's assumed rate to the valuation date. The actuarial value of assets will be limited to a maximum of 120% and a minimum of 80% of the market value of assets as of the valuation date.

1. Actuarial Value of Assets as of 1/1/2018	\$ 301,871,774.88
2. Contributions and Other Deposits Except Investment Income	\$ 5,160,562.63
3. Benefit Payments and Administrative Expenses or Other Payments	\$ 18,358,245.20
4. Interest at 1% less than the plan's assumed rate to the valuation date 2018: $0.065 \times [(1) + 0 \times (2) - 11/24 \times (3)]$	\$ 19,074,742.65
5. Preliminary Actuarial Value of Assets: $(1) + (2) - (3) + (4)$	\$ 307,748,834.96
6. Market Value of Assets as of 1/1/2019	\$ 277,032,205.87
7. 80% of Market Value: $.8 \times (6)$	\$ 221,625,764.70
8. 120% of Market Value: $1.2 \times (6)$	\$ 332,438,647.04
9. Actuarial Value of Assets as of 1/1/2019: Greater of (5) and (6) but not less than (7) nor more than (8)	\$ 307,748,834.96



Schedule H

APPROXIMATE RATE OF RETURN FOR 2018 PLAN YEAR

		<u>Actuarial Value</u>		<u>Market Value</u>
1.	Value as of December 31, 2017	\$ 301,871,774.88	\$	301,871,774.88
2.	Contributions Received During Year	\$ 5,160,562.63	\$	5,160,562.63
3.	Benefits and Expenses Paid During Year	\$ 18,358,245.20	\$	18,358,245.20
4.	Value as of December 31, 2018	\$ 307,748,834.96	\$	277,032,205.87
5.	Non-Investment Increment: (2) - (3)	\$ (13,197,682.57)	\$	(13,197,682.57)
6.	Investment Increment: (4) - (1) - (5)	\$ 19,074,742.65	\$	(11,641,886.44)
7.	Time Weighted Value of Assets: (1) + .5 x (5)	\$ 295,272,933.60	\$	295,272,933.60
8.	Approximate Rate of Return for 2018: (6) / (7)	6.46%		(3.94%)

HISTORY OF RATE OF RETURNS

<u>Plan Year</u>	<u>Actuarial Value Rate of Return</u>	<u>Market Value Rate of Return</u>
2018	6.46%	(3.94%)
2017	9.44%	13.74%
2016	6.47%	8.55%
2015	6.46%	0.94%
2014	7.13%	7.13%
2013	15.09%	21.38%
2012	6.40%	6.07%
2011	6.41%	1.40%
2010	11.31%	12.58%
2009	6.09%	24.27%
Five Year Average (2014 - 2018):	7.19%	5.10%
Ten Year Average (2009 - 2018):	8.09%	8.88%



Schedule I

Determination of Reserve Balances

	<u>M.A.R.A.</u>	<u>C.A.R.A.</u>	<u>R.M.R.A.</u>	<u>TOTAL</u>
Balance 1/1/2018	\$ 61,291,445.07	\$ 11,367,975.38	\$ 159,967,189.00	\$ 232,626,609.45
County Appropriations		1,240,109.00		1,240,109.00
Member Contributions	3,868,685.89			3,868,685.89
Member Purchases				0.00
Net Investment Income		27,130,386.62		27,130,386.62
Investment Expenses		(924,585.84)		(924,585.84)
Member Contributions Refunded	(333,880.70)			(333,880.70)
Pension Payments			(16,591,533.66)	(16,591,533.66)
Death Benefits			(269,439.42)	(269,439.42)
Retiree and Death Benefit Transfers	(3,078,080.83)	(4,400,782.05)	7,478,862.88	0.00
Cost of Living Funding Requirement				0.00
Administrative Expenses		(187,881.42)		(187,881.42)
Miscellaneous		51,767.74		51,767.74
Miscellaneous		(50,924.16)		(50,924.16)
Balance Before Interest	61,748,169.43	34,226,065.27	150,585,078.80	246,559,313.50
Interest Allocated in 2018	3,563,252.22	(9,774,297.58)	6,211,045.36	
Balance Before Actuarial Adjustments	65,311,421.65	24,451,767.69	156,796,124.16	246,559,313.50
Actuarial Adjustments		(5,375,971.84)	5,375,971.84	
Ending Balance 12/31/2018	65,311,421.65	19,075,795.85	162,172,096.00	246,559,313.50
Unrealized Appreciation				30,472,892.37
Total Assets (12/31/2018) (Market Value)				277,032,205.87



Schedule J

Membership History

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

January 1	ACTIVE MEMBERS AND VESTED TERMINATED MEMBERS			RETIRED MEMBERS AND BENEFICIARIES		
	Male	Female	Total	Male	Female	Total
2019	363	513	876	345	849	1,194
2018	369	512	881	344	836	1,180
2017	368	524	892	336	829	1,165
2016	386	557	943	285	771	1,056
2015	379	577	956	276	746	1,022
2014	456	920	1,376	230	577	807
2013	465	982	1,447	216	534	750
2012	464	1,038	1,502	199	486	685
2011	466	1,071	1,537	190	470	660
2010	453	1,033	1,486	186	452	638



Schedule K

Changes in Plan Participation From January 1, 2018 to January 1, 2019

ACTIVE PARTICIPANTS		
Number as of January 1, 2018		741
Changes During Plan Year:		
Retired	(-)	21
Terminated and Vested	(-)	3
Terminated	(-)	28
Died	(-)	0
New Participants	(+)	53
Number as of January 1, 2019		742
RETIRED PARTICIPANTS		
Number as of January 1, 2018		1,180
Changes During Plan Year:		
Returned to Active Service	(-)	0
Died	(-)	18
New Retirements from Active Service	(+)	21
New Surviving Annuitants	(+)	3
Vested Terminated Participants Whose Benefits Commenced	(+)	8
Number as of January 1, 2019		1,194
TERMINATED VESTED PARTICIPANTS		
Number as of January 1, 2018		140
Changes During Plan Year:		
Returned to Active Service	(-)	0
Benefits Commenced	(-)	8
Died	(-)	1
New Termination's with Vesting	(+)	3
Number as of January 1, 2019		134

Schedule L

Age, Service and Average Salary Profile of the Active Members on January 1, 2019.

MALES -- FULL YEARS OF SERVICE TO JANUARY 1, 2019

<u>Age</u>	<u>0-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	<u>Total</u>	<u>Average Salary</u>
0-19	0	0	0	0	0	0	0	0	\$ 0
20-24	6	0	0	0	0	0	0	6	\$ 33,342
25-29	11	6	0	0	0	0	0	17	\$ 46,128
30-34	9	13	2	0	0	0	0	24	\$ 55,341
35-39	7	7	20	5	0	0	0	39	\$ 58,602
40-44	9	4	13	8	7	1	0	42	\$ 53,746
45-49	7	5	7	7	12	7	0	45	\$ 65,596
50-54	12	7	4	3	7	12	2	47	\$ 63,928
55-59	6	11	1	2	4	5	3	32	\$ 55,368
60-64	7	7	6	5	8	2	4	39	\$ 57,457
65 +	5	3	7	3	5	1	8	32	\$ 52,595
Total	79	63	60	33	43	28	17	323	\$ 57,298

Average Age: 48.26
Average Service: 13.11

FEMALES -- FULL YEARS OF SERVICE TO JANUARY 1, 2019

<u>Age</u>	<u>0-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	<u>Total</u>	<u>Average Salary</u>
0-19	0	0	0	0	0	0	0	0	\$ 0
20-24	2	2	0	0	0	0	0	4	\$ 31,763
25-29	22	4	0	0	0	0	0	26	\$ 34,703
30-34	10	10	2	0	0	0	0	22	\$ 41,797
35-39	15	11	7	2	0	0	0	35	\$ 43,124
40-44	8	9	12	17	8	0	0	54	\$ 53,378
45-49	6	7	4	8	14	5	2	46	\$ 57,241
50-54	14	11	8	14	10	8	5	70	\$ 48,264
55-59	8	15	9	9	9	7	7	64	\$ 46,234
60-64	1	7	5	14	9	10	17	63	\$ 49,965
65 +	2	3	3	7	6	5	9	35	\$ 50,221
Total	88	79	50	71	56	35	40	419	\$ 48,250

Average Age: 49.70
Average Service: 14.79



Schedule M

Actuarial Assumptions and Actuarial Cost Method for Funding Purposes, January 1, 2019.

Actuarial Assumptions

Mortality Rates: 2013 RP Annuitant and Non-Annuitant Mortality Tables for males and females with no projected improvement.

Withdrawal Rates: Members not eligible to retire are assumed to terminate employment in accordance with a percentage of the withdrawal rates set forth in Table T-7 of the Actuary's Handbook. The applicable percentage depends on the member's years of service as follows:

YEARS OF SERVICE	PERCENTAGE
Less than 1	300%
1 but less than 2	275%
2 but less than 3	250%
3 but less than 4	225%
4 but less than 5	200%

It is further assumed that a percentage of members who terminate after having met the Plan's five year vesting requirement will elect an immediate refund of their own contributions with interest thus forfeiting the County -- provided pension. The applicable percentage is 100% for termination ages up to age 30. After age 30 the applicable percentage is determined as 100% less $(\text{age} - 30) \times 3 \frac{1}{3}\%$. Illustrative percentages are as follows:

AGE	PERCENTAGE
30 or less	100.0%
35	83.3%
40	66.7%
45	50.0%
50	33.3%
55	16.7%

Once member reaches retirement eligibility, a withdrawal rate of zero is assumed.



Schedule M - Continued

The following tables set forth illustrative withdrawal rates as determined in accordance with the methodology described on the previous page.

Probability of Withdrawing During the Year:

LESS THAN FIVE YEARS OF SERVICE

<u>Age at Hire</u>	<u>Years of Service</u>				
	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
20	.2982	.2720	.2460	.2202	.1947
30	.2791	.2532	.2275	.2021	.1770
40	.2326	.2067	.1814	.1570	.1335
50	.1267	.1013	.0781	.0577	.0407
59	.0086	-	-	-	-

FIVE OR MORE YEARS OF SERVICE

<u>Age at Beginning of Year</u>	<u>Probability of Withdrawing and Forfeiting County Pension</u>	<u>Probability of Withdrawing and Retaining County Pension</u>
30	.0930	.0000
40	.0517	.0258
50	.0141	.0281
59	.0001	.0028



Schedule M - Continued

Retirement Rates: Members eligible to retire are assumed to retire in accordance with the following rates:

<u>AGE AT BEGINNING OF YEAR</u>	<u>PROBABILITY OF RETIRING DURING YEAR</u>
55-59	.07
60-61	.08
62-64	.15
65	.34
66-70	.23
71-79	.21
80	1.00

Disability Rates: Disability rates are not used.

Investment Return: 7.5% per annum, compounded annually.

Salary Increases: 3.5% per annum.

Valuation Assets: The asset method that is prescribed by Pennsylvania State Law, Act 44, which is the greater of the market value of assets as of the valuation date and the actuarial value of assets as of the prior valuation date plus contributions and other deposits except investment income minus benefit payments and administrative expenses or other payments plus credited interest at 1% less than the plan's assumed rate to the valuation date. The actuarial value of assets will be limited to a maximum of 120% and a minimum of 80% of the market value of assets as of the valuation date.

Administrative Expenses: Assumed to be paid from the County's general fund and not from plan assets. However, administrative expenses may from year to year be paid from the fund unless it is determined by the actuary that such payment will impair the actuarial soundness of the fund.

Actuarial Cost Method: The actuarial cost method used to determine the plan's funding requirements is the entry age normal method. Under this method, an actuarial accrued liability is determined as the actuarial present value of projected benefits for all participants minus the actuarial present value of future normal costs. The normal cost is determined as the annual amount required to fund between entry age and assumed exit age the actuarial present value of projected benefits for each active participant under the assumed retirement age.

Changes Since Prior Valuation: None.

Schedule N

Summary of Plan Provisions

1. **Effective Date** - The effective date of this plan is January 1, 1942.
2. **Eligibility for Plan Membership** - An employee shall be eligible to become a participant immediately upon becoming an employee.
3. **Accrued Benefit** - The Retirement Board has authorized benefits equal to a percentage of the members Final Average Salary for each year of service the member has participated in the following Classes:

Class	Percentage	Effective
1/120	0.833%	01/01/1942
1/100	1.000%	01/01/1950
1/80	1.250%	01/01/1965
1/60	1.667%	01/01/1972

4. Normal Retirement (Superannuation)

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) 0.833% of 1/12th of Final Average Salary multiplied by years of credited service on the 1/120 Class,
1.000% of 1/12th of Final Average Salary multiplied by years of credited service on the 1/100 Class,
1.250% of 1/12th of Final Average Salary multiplied by years of credited service on the 1/80 Class,
1.667% of 1/12th of Final Average Salary multiplied by years of credited service on the 1/60 Class,

PLUS

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

Schedule N - Continued

5. **Final Average Salary** - The average of the member's annual compensation received for the three years which produce the highest such average.
6. **Compensation** - Pick-up contributions plus remuneration 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.

7. **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 in 4(a),

PLUS

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

8. **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.

9. **Postponed Retirement** - A member may work past normal retirement age and continue to accrue pension credits.

Schedule N - Continued

10. 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.

11. Normal Form of Pension - Benefits are payable in the form of a modified cash refund life annuity, that is for the member's lifetime only, except that disability benefits shall cease upon cessation of disability.

12. Optional Retirement Benefits - A member may elect to receive the actuarial equivalent of his retirement benefit as a full cash refund annuity (Option One) 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.

13. 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 (7a) 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.

(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.

Schedule N - Continued

14. Employee Contributions

Employees on the 1/60 Class must contribute between 9% and 19% of salary.

15. Deposit Administrator

Investment Managers:

CIM Investment Managers	Bentall Kennedy/MEPT
C.S. McKee	Altair Management
Anchor Capital Advisors	Washington Alliance
Emerald Advisors	iNetworks
Navellier	Ameriserv
Swarthmore Group	Vanguard
Dimensional Bryan Fund	Attilanus
Janney Montgomery Scott	
Draper Triangle	

Custodian:
Huntingdon National Bank

Investment Consultant:
Morrison Fiduciary Advisors

16. Administration - Retirement Board as designated in Act 96 of 1971, the County Pension Law.

17. Cost-of-Living - The cost-of-living increase shall be reviewed at least once in every three years by the Retirement Board. Prior to 2017, a percentage of the CPI could be granted. After 2016, the annual CPI could be granted. The Board has granted cost-of-living increases in the past as follows:

PERCENTAGE/ANNUAL CHANGE IN C.P.I.	EFFECTIVE DATE OF INCREASE
25%	1/1/1987
25%	1/1/1989
25%	1/1/1990
25%	1/1/1993
25%	1/1/1997
100%	1/1/2000



Schedule O

Historical Trend Information

REVENUES BY SOURCE

<u>Fiscal Year</u>	<u>Employee Contributions</u>	<u>Employer Contributions</u>	<u>Investment Income</u>	<u>Miscellaneous</u>	<u>Total</u>
2009	\$ 5,117,588	\$ 19,227,192	\$ 5,855,234	\$ 0	\$ 30,200,014
2010	5,095,982	3,096,622	5,361,199	0	13,553,803
2011	5,319,515	2,286,304	16,980,180	0	24,585,999
2012	5,268,443	3,312,744	13,316,617	54,785	21,952,589
2013	5,246,490	3,790,653	23,563,316	24,155	32,624,614
2014	3,786,449	2,286,670	23,322,661	77,941	29,473,721
2015	3,345,109	1,162,800	20,453,863	59,264	25,021,036
2016	3,278,822	1,265,160	14,499,389	47,251	19,090,622
2017	3,608,538	1,999,290	16,773,898	843,973	23,225,699
2018	3,868,686	1,240,109	27,130,386	51,768	32,290,949

EXPENSES BY TYPE

<u>Fiscal Year</u>	<u>Benefits</u>	<u>Refunds</u>	<u>Administrative/ Miscellaneous</u>	<u>Total</u>
2009	\$ 7,626,306	\$ 845,693	\$ 811,578	\$ 9,283,577
2010	7,023,243	1,260,833	1,643,175	9,927,251
2011	7,843,692	959,166	3,739,013	12,541,871
2012	10,385,407	1,387,991	1,086,835	12,860,233
2013	11,586,605	1,100,134	1,191,673	13,878,412
2014	21,050,047	2,415,803	1,300,620	24,766,470
2015	15,013,622	505,191	1,140,716	16,659,529
2016	19,385,810	390,939	1,148,172	20,924,921
2017	17,380,674	394,555	1,116,886	18,892,115
2018	16,860,973	333,881	1,163,391	18,358,245



Schedule O - Continued

Plan Maturity Measures

Assets are accumulated over participants' careers to pay future benefits. The natural growth of liabilities and assets is referred to as plan maturity. As the plan matures, the size of the plan grows relative to the active members' payroll and will cause changes in the assets or liabilities to have a larger effect on the Actuarially Determined Contribution (ADC). The following table shows a history of the plan's maturity and the effect of a 1% change in plan assets or liabilities on the ADC.

<u>Fiscal Year</u>	<u>Actives Per Retirees</u>	<u>Ratio of Assets to Payroll</u>	<u>Effect on ADC of a 1% Change in Assets</u>	<u>Ratio of Actuarial Accrued Liability to Payroll</u>	<u>Effect on ADC of a 1% Change in Liability</u>
2018	.6	7.2	\$ 315,000	7.9	\$ 350,000

The Society of Actuaries' Retirement Plans Experience Committee (RPEC) has released the final report of the Pub-2010 Public Retirement Plans Mortality Tables. The primary focus of this study was a comprehensive review of recent mortality experience of public retirement plans in the United States. There are separate tables for teachers, safety employees, and general employees. The effect of changing to the Pub-2010 for General on the ADC is an increase of \$1,800,000.