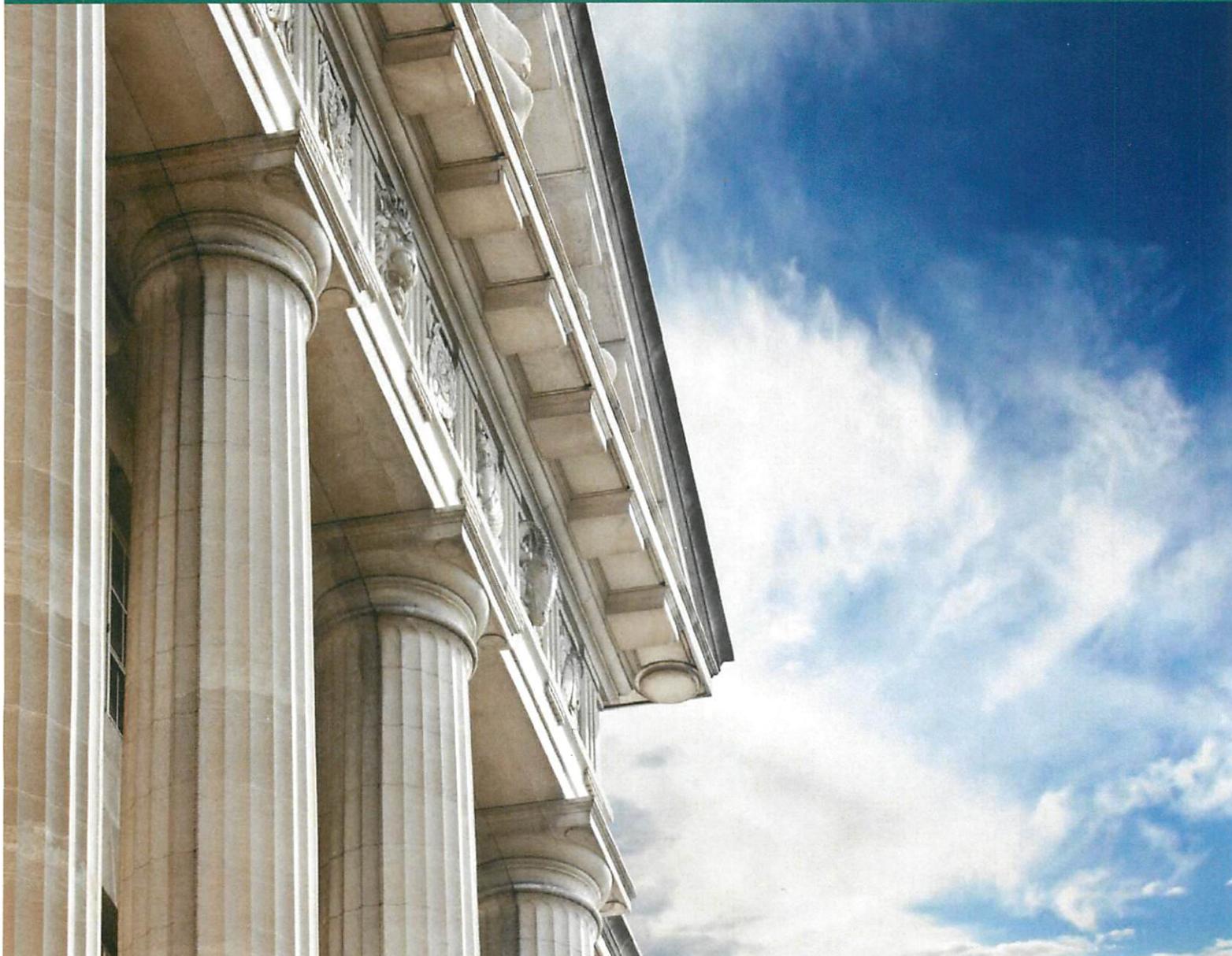


Butler County Employees' Retirement System

**Report on 2017 Actuarial Valuation Including
Determination of County Actuarially Determined
Contribution for 2017**





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for

Butler County Employees' Retirement Board

Leslie A. Osche	Commissioner/Chairman
Kimberly D. Geyer	Commissioner
Kevin E. Boozel	Commissioner
Benjamin Holland	Controller/Secretary
Diane R. Marburger	Treasurer

May 25, 2017



Table of Contents

I. Introduction	1
II. Findings	2
III. Schedules	3
Schedule A – Changes in Plan Net Assets, Plan Assets, Plan Description and Contribution Information, and Historical Accounting Information	3
Schedule B – Allocation of Assets and Liabilities - January 1, 2017.....	9
Schedule C – Unfunded Actuarial Liability and Normal Cost	10
Schedule D – Actuarial Gain (Loss) for One Year Period Ending December 31, 2016.....	11
Schedule E – Amortization Schedule.....	12
Schedule F – Determination of Certified Actuarially Determined Contribution	13
Schedule G – Notes for Schedule B and I and the Actuarial Value of Assets	14
Schedule H – Approximate Rate of Return for 2016.....	16
Schedule I – Determination of Reserve Balances	17
Schedule J – Membership History	18
Schedule K – Changes in Plan Participation from January 1, 2016 to January 1, 2017	19
Schedule L – Age, Service and Average Salary Profile	20
Schedule M – Actuarial Assumptions and Actuarial Cost Method for Funding Purposes, January 1, 2017.....	21
Schedule N – Summary of Plan Provisions	24
Schedule O – Historical Trend Information.....	28

I. Introduction

The primary purpose of this report is to investigate and fully and fairly disclose the actuarial position of the Butler County Employees' Retirement System as of January 1, 2017 and to establish the proper appropriation for the 2017 plan year, in accordance with the funding standards of Section 6 of Act 96, 1971 of the Commonwealth of Pennsylvania as amended.

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.

Respectfully submitted,

Korn Ferry HayGroup, Inc.

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 13 of this report and which must be funded in 2017 is \$5,473,038. 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 9 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	\$	2,940,464.99
Retired Members Annuity Reserve Account	\$	2,940,464.99

III. Schedules

Schedule A

BUTLER COUNTY EMPLOYEES' RETIREMENT SYSTEM

CHANGES IN PLAN NET ASSETS FOR THE CALENDAR YEAR 2016 AND 2015

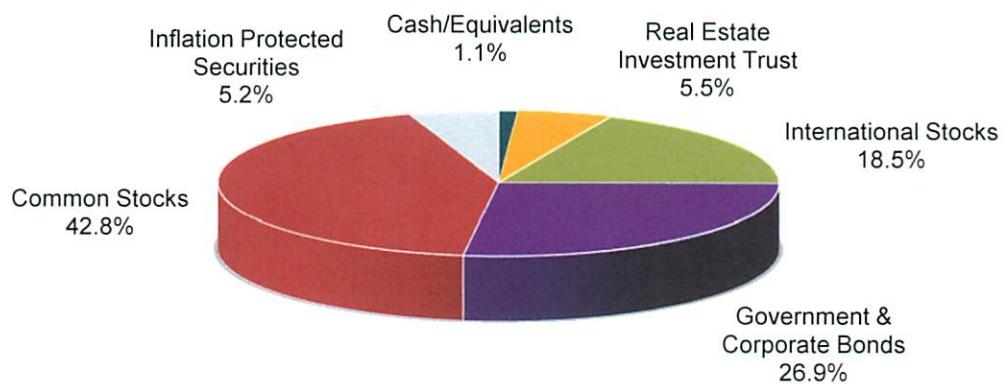
	Additions		
			<u>2016 Total</u>
	<u>2015 Total</u>		
Contributions			
County	\$ 5,474,488.00	\$	5,052,744.00
Plan Members	\$ 3,231,334.36	\$	3,187,124.33
Miscellaneous	\$ 0.00	\$	(63,967.40)
Total Contributions	<u>\$ 8,705,822.36</u>	<u>\$</u>	<u>8,175,900.93</u>
Investment Income			
Realized Gain	\$ 4,242,319.11	\$	\$
Unrealized Gain	<u>\$ 6,055,472.01</u>	<u>\$</u>	<u>(5,391,669.70)</u>
Net Gain in Fair Value	\$ 10,297,791.12	\$	\$ 1,593,144.52
Interest	\$ 1,944,539.65	\$	2,593,470.14
Dividends	\$ 2,760,277.46	\$	14,890.08
Net Accrued Interest	\$ 37,762.71	\$	(1,190,164.96)
Investment Income	<u>\$ 15,040,370.94</u>	<u>\$</u>	<u>\$</u>
Less Investment Expense	\$ 206,199.70	\$	199,146.28
Net Investment Income	<u>\$ 14,834,171.24</u>	<u>\$</u>	<u>(1,389,311.24)</u>
Total Additions	<u>\$ 23,539,993.60</u>	<u>\$</u>	<u>6,786,589.69</u>
Deductions			
Benefits	\$ 11,242,028.80	\$	10,628,197.75
Refunds of Member Contributions	\$ 223,631.95	\$	150,569.08
Administrative Expense	<u>\$ 130,940.76</u>	<u>\$</u>	<u>139,428.40</u>
Total Deductions	<u>\$ 11,596,601.51</u>	<u>\$</u>	<u>10,918,195.23</u>
Net Increase/(Decrease)	<u>\$ 11,943,392.09</u>	<u>\$</u>	<u>(4,131,605.54)</u>
Net Assets Held In Trust For Pension Benefits			
Beginning of Year	\$ 175,922,687.52	\$	180,054,293.06
End of Year	<u>\$ 187,866,079.61</u>	<u>\$</u>	<u>175,922,687.52</u>

Schedule A – Continued

BUTLER COUNTY EMPLOYEES' RETIREMENT SYSTEM PLAN ASSETS AS OF DECEMBER 31, 2016 AND 2015

	Assets		
	2016 Total	2015 Total	
Cash and Short-Term Investments	\$ 1,500,111.01	\$ 1,986,308.89	
Receivables	\$ 3,805.27	\$ 2,971.20	
Investments, at fair market value			
Government & Corporate Bonds	\$ 50,583,376.67	\$ 39,596,732.37	
Inflation Protected Securities	\$ 9,671,730.34	\$ 17,936,192.06	
Common Stocks	\$ 80,481,724.56	\$ 73,853,070.12	
International Stocks	\$ 34,680,088.61	\$ 32,996,635.88	
Real Estate Investment Trust	\$ 10,414,937.05	\$ 9,598,456.61	
Invested Cash/Accrued Income	\$ 586,629.42	\$ 0.00	
Total Investments	<u>\$ 186,418,486.65</u>	<u>\$ 173,981,087.04</u>	
Total Assets	<u>\$ 187,922,402.93</u>	<u>\$ 175,970,367.13</u>	
Liabilities			
Refunds Payable and Other	\$ 56,323.32	\$ 47,679.61	
Net Assets Held In Trust For Pension Benefits			
	<u>\$ 187,866,079.61</u>	<u>\$ 175,922,687.52</u>	

TOTAL ASSETS (MARKET VALUE 12-31-2016)



Schedule A - Continued

Butler County Employees' Retirement System

Plan Description and Contribution Information

Basis of Accounting: The Butler 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, 2017:

Retirees and Beneficiaries Receiving Benefits	589
Terminated Plan Members Entitled to but not yet Receiving Benefits	86
Active Plan Members	<hr/> 570
Total	<hr/> 1,245
Number of Participating Employers	1

Schedule A - Continued

Butler County Employees' Retirement System

Plan Description: The Butler 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 Butler 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

Year	Contribution *	County Contribution
2007	\$ 4,804,224	\$ 4,804,224
2008	\$ 4,712,669	\$ 4,712,669
2009	\$ 6,486,486	\$ 6,486,486
2010	\$ 6,095,561	\$ 6,095,561
2011	\$ 6,564,903	\$ 6,564,903
2012	\$ 6,860,358	\$ 6,860,358
2013	\$ 7,313,625	\$ 7,313,625
2014	\$ 6,152,213	\$ 6,152,213
2015	\$ 5,052,744	\$ 5,052,744
2016	\$ 5,474,488	\$ 5,474,488

Note: Effective in 2005 the Entry Age Funding Method was used to determine the annual required contribution. Prior to 2005 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.



Schedule A - Continued

SCHEDULE OF FUNDING PROGRESS

<u>Actuarial Valuation Date</u>	<u>Actuarial Value of Assets</u> (a)	<u>Actuarial Accrued Liability</u> (AAL) <u>- Entry Age</u>	<u>Unfunded AAL</u> (UAAL) <u>(b-a)</u>	<u>Funded Ratio</u> (a/b)	<u>Covered Payroll</u> (c)	<u>UAAL as a Percentage of Covered Payroll</u> ((b-a)/c)
1/1/2008	106,174,910	134,672,189	28,497,279	78.8%	29,936,923	95.2%
1/1/2009	102,163,256	145,148,259	42,985,003	70.4%	30,575,991	140.6%
1/1/2010	111,030,976	148,852,958	37,821,982	74.6%	31,576,155	119.8%
1/1/2011	120,338,204	160,325,187	39,986,983	75.1%	33,098,062	120.8%
1/1/2012	131,446,907	172,292,041	40,845,134	76.3%	34,891,445	117.1%
1/1/2013	144,118,424	186,098,445	41,980,021	77.4%	36,117,283	116.2%
1/1/2014	171,903,108	200,826,982	28,923,874	85.6%	36,891,238	78.4%
1/1/2015	180,054,293	203,079,020	23,024,727	88.7%	28,933,497	79.6%
1/1/2016	188,485,177	213,698,092	25,212,915	88.2%	30,826,860	81.8%
1/1/2017	197,288,110	222,337,689	25,049,579	88.7%	30,796,428	81.3%

Schedule A - Continued

HISTORICAL ACCOUNTING INFORMATION

The information was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation Date	01/01/2017
Actuarial Cost Method	Entry Age
Asset Valuation Method	The method that is prescribed by Pennsylvania State Law, Act 44 as described in Schedule M
Actuarial Assumptions:	
Investment Rate of Return *	7.5%
Projected Salary Increases *	3.5%
* Includes Inflation at	3%

ACCOUNTING PROCEDURES FOR CALCULATING - NET PENSION OBLIGATION (NPO)

Subsequent years Net Pension Liability calculation found in GASB 67 & 68 disclosure report

(1) Year	(2) ARC	(3) Interest on NPO ***	(4) ARC Adjustment **	(5) Pension Cost (2+3-4)	(6) Contribution	(7) Change in NPO (5-6)	(8) NPO Balance* (BB+7)
2005	4,293,595	0	0	4,293,595	4,293,595	0	0
2006	4,572,844	0	0	4,572,844	4,572,844	0	0
2007	4,804,224	0	0	4,804,224	4,804,224	0	0
2008	4,712,669	0	0	4,712,669	4,712,669	0	0
2009	6,486,486	0	0	6,486,486	6,486,486	0	0
2010	6,095,561	0	0	6,095,561	6,095,561	0	0
2011	6,564,903	0	0	6,564,903	6,564,903	0	0
2012	6,860,358	0	0	6,860,358	6,860,358	0	0
2013	7,313,625	0	0	7,313,625	7,313,625	0	0

* BB = Beginning balance for the year.

** ARC Adjustment - Amortization factor based upon level percentage of projected payroll.

*** Interest on the balance of the NPO at the beginning of the year using the investment return rate assumed in determining ARC. The interest is an estimate of the investment earnings lost to the plan on any contributions that were not made (7.5% when applicable).



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, 2017. The liabilities were determined from the actuarial valuation of the System based upon the data submitted by the County.

ASSETS

Members' Annuity Reserve Account	\$	44,870,878.87
County Annuity Reserve Account	\$	14,888,778.77
Retired Members' Reserve Account	\$	107,696,689.00
Unrealized Appreciation of Assets	\$	20,409,732.97
<i>Total Assets, (Market Value) of the Butler County Employees' Retirement Fund</i>	\$	187,866,079.61

LIABILITIES

Actuarial Present Value of:

Accumulated Plan Benefits		
Vested participants (398)	\$	36,957,277
Nonvested participants (172)	\$	418,970
Future Benefit Accruals	\$	38,597,912
Terminated Vested Benefits	\$	6,379,348
Retired Benefits	\$	107,696,689
Member Accumulated Deductions	\$	44,870,879
<i>Total Liabilities of the Butler County Employees' Retirement Fund</i>	\$	234,921,075

Schedule C

Unfunded Actuarial Liability and Normal Cost

Schedule C shows the development of the unfunded actuarial liability and the normal cost for 2017.

I. Unfunded Actuarial Liability January 1, 2017

1. Actuarial Liability:

(a) Active Participants

Retirement Benefits	\$ 56,676,905
Termination Benefits	4,650,297
Death Benefits	2,063,571
Total	\$ 63,390,773

(b) Terminated Vested Participants

\$ 6,379,348

(c) Retired Members and Beneficiaries

Retirement Benefits	\$ 105,407,088
Cost-of-Living Benefits	2,289,601
Total	\$ 107,696,689

(d) Member Accumulated Deductions

\$ 44,870,879

(e) Total (a) + (b) + (c) + (d)

\$ 222,337,689

2. Actuarial Value of Plan Assets (see page 15)

\$ 197,288,110

3. Unfunded Actuarial Liability as of January 1, 2017: (1e) – (2)

\$ 25,049,579

II. Normal Cost for 2017

1. Normal Cost for:

(a) Retirement Benefits

\$ 1,352,831

(b) Termination Benefits

222,263

(c) Death Benefits

53,963

(d) Normal Cost as of January 1, 2017

\$ 1,629,057

(e) Normal Cost with interest to end of year: (d) x 1.075

\$ 1,751,236



Schedule D

Actuarial Gain (Loss) for One Year Period Ending December 31, 2016

Schedule D shows the development of the actuarial gain (loss) for the 2016 plan year.

1. Unfunded Actuarial Liability as of January 1, 2016	\$ 25,212,915
2. Normal Cost as of January 1, 2016	1,692,995
3. Interest at 7.5% Per Year to December 31, 2016 on (1) and (2)	2,017,943
4. Employer Contributions for the 2016 Plan Year	5,474,488
5. Change in Unfunded Actuarial Liability Due to Cost of Living Increase to Retireds	0
6. Change in Unfunded Actuarial Liability Due to Change in Assumptions	<hr/> 0
7. Expected Unfunded Actuarial Liability as of January 1, 2017: (1) + (2) + (3) - (4) + (5) + (6)	23,449,365
8. Unfunded Actuarial Liability as of January 1, 2017	25,049,579
9. Actuarial Gain (Loss) for 2016 Plan Year: (7) – (8)	(1,600,214)

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 2017

						As of January 1, 2017
	Initial <u>Amount</u>	Effective <u>Date</u>	Remaining <u>Period</u>	Outstanding <u>Balance</u>	Amortization Charge or <u>(Credit)</u>	
Amortization of Liability for:						
(a) Initial UAAL	\$ 28,229,305	1/1/2005	18 Years	\$23,199,403	\$2,390,210	
(b) Ret. COLA inc.	787,778	1/1/2008	1 Years	106,762	114,768	
(c) Ret. COLA inc.	734,747	1/1/2009	2 Years	192,202	107,042	
(d) Experience loss	1,745,327	1/1/2006	4 Years	662,239	197,723	
(e) Experience loss	59,174	1/1/2007	5 Years	27,125	6,704	
(f) Experience gain	(2,392,470)	1/1/2008	6 Years	(1,272,202)	(271,036)	
(g) Experience loss	14,230,176	1/1/2009	7 Years	8,538,634	1,612,097	
(h) Experience loss	9,249,636	1/1/2010	8 Years	6,137,669	1,047,866	
(i) Experience loss	3,404,942	1/1/2011	9 Years	2,460,574	385,736	
(j) Experience loss	2,321,453	1/1/2012	10 Years	1,805,192	262,991	
(k) Experience loss	931,198	1/1/2013	11 Years	771,725	105,493	
(l) Salary assump chg.	(5,905,887)	1/1/2010	13 Years	(4,707,469)	(579,321)	
(m) Asset val method chg.	(7,397,011)	1/1/2010	13 Years	(5,896,020)	(725,589)	
(n) Mortality table chg.	1,865,621	1/1/2013	11 Years	1,546,122	211,351	
(o) Experience gain	(11,162,488)	1/1/2014	12 Years	(9,781,781)	(1,264,567)	
(p) Experience gain	(4,290,844)	1/1/2015	13 Years	(3,949,954)	(486,098)	
(q) Experience loss	3,752,830	1/1/2016	14 Years	3,609,144	425,148	
(r) Experience loss	1,600,214	1/1/2017	15 Years	1,600,214	181,284	
(s) Total				\$ 25,049,579	\$ 3,721,802	

Schedule F

Schedule F determines the certified actuarially determined contribution of \$5,473,038 for 2017 for the Butler County Employees' Retirement System.

1.	Total Amortization Charge/(Credit) (page 12 (s))	\$ 3,721,802
2.	Normal Cost with interest to end of year (page 10 II 1(e))	\$ 1,751,236
3.	Total Funding Requirement for 2017 (actuarially determined contribution for 2017): (1) + (2), but not less than 0	\$ 5,473,038

Notes:

The actuarially determined contribution for 2017 as a percentage of the estimated 2017 compensation (\$30,796,428) for active members is 17.77%.

The equivalent normal cost accrual rate to be applied to actual 2016 salaries to determine reimbursable expenses is 18.39%.

Schedule G

The following are notes to Schedules B and I:

Members' Annuity Reserve Account: The balance of \$44,870,878.87 in this account is the total of the contributions deducted from the salaries of the active and terminated vested members of the retirement system and the IRC 414(h)(2) pickup contributions together with the interest additions as of January 1, 2017. Since these accumulations represent the present value as of January 1, 2017, of future benefits, the reserve balance and liability are identical.

County Annuity Reserve Account: The balance of \$14,888,778.77 in this account as of January 1, 2017 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, 2017 amount to \$107,696,689.00. 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 1/1/2016	\$ 188,485,177.40
2. Contributions and Other Deposits Except Investment Income	\$ 8,705,822.36
3. Benefit Payments and Administrative Expenses or Other Payments	\$ 11,802,801.21
4. Interest at 1% less than the plan's assumed rate to the valuation date 2016: $0.065 \times [(1) + 0 \times (2) - 11/24 \times (3)]$	\$ 11,899,911.41
5. Preliminary Actuarial Value of Assets: (1) + (2) - (3) + (4)	\$ 197,288,109.96
6. Market Value of Assets as of 1/1/2017	\$ 187,866,079.61
7. 80% of Market Value: $.8 \times (6)$	\$ 150,292,863.69
8. 120% of Market Value: $1.2 \times (6)$	\$ 225,439,295.53
9. Actuarial Value of Assets as of 1/1/2017: Greater of (5) and (6) but not less than (7) nor more than (8)	\$ 197,288,109.96

Schedule H

APPROXIMATE RATE OF RETURN FOR 2016 PLAN YEAR

		<u>Actuarial Value</u>	<u>Market Value</u>
1. Value as of December 31, 2015	\$	188,485,177.40	\$ 175,922,687.52
2. Contributions Received During Year	\$	8,705,822.36	\$ 8,705,822.36
3. Benefits and Expenses Paid During Year	\$	11,802,801.21	\$ 11,802,801.21
4. Value as of December 31, 2016	\$	197,288,109.96	\$ 187,866,079.61
5. Non-Investment Increment: (2) - (3)	\$	(3,096,978.85)	\$ (3,096,978.85)
6. Investment Increment: (4) - (1) - (5)	\$	11,899,911.41	\$ 15,040,370.94
7. Time Weighted Value of Assets: (1) + .5 x (5)	\$	186,936,687.98	\$ 174,374,198.10
8. Approximate Rate of Return for 2016: (6) / (7)		6.37%	8.63%

HISTORY OF RATE OF RETURNS

<u>Plan Year</u>	<u>Actuarial Value Rate of Return</u>	<u>Market Value Rate of Return</u>
2015	6.37%	(0.67%)
2014	8.44%	8.44%
2013	17.25%	17.25%
2012	7.99%	13.53%
2011	6.25%	0.95%
2010	6.32%	13.29%
2009	6.22%	20.12%
2008	(5.44%)	(23.54%)
2007	11.10%	9.34%
Five Year Average (2012 - 2016):		9.21%
Ten Year Average (2007 - 2016):		6.95%
		9.27%
		5.99%

Schedule I**Determination of Reserve Balances**

	M.A.R.A.	C.A.R.A.	R.M.R.A.	TOTAL
Balance 1/1/2016	\$ 43,112,525.04	\$ 17,423,084.52	\$ 101,032,817.00	\$ 161,568,426.56
County Appropriations		5,474,488.00		5,474,488.00
Member Contributions	3,221,618.08	9,716.28		3,231,334.36
Member Purchases		0.00		0.00
Net Investment Income		8,984,898.93		8,984,898.93
Investment Expenses		(206,199.70)		(206,199.70)
Member Contributions Refunded	(223,631.95)			(223,631.95)
Pension Payments			(11,026,004.57)	(11,026,004.57)
Death Benefits			(216,024.23)	(216,024.23)
Retiree and Death Benefit Transfers	(3,562,804.12)	(7,367,552.29)	10,930,356.41	0.00
Cost of Living Funding Requirement		0.00	0.00	0.00
Administrative Expenses		(130,940.76)		(130,940.76)
Miscellaneous	(0.14)	(0.02)	0.16	0.00
Balance Before Interest	42,547,706.91	24,187,494.96	100,721,144.77	167,456,346.64
Interest Allocated in 2016	2,323,171.96	(6,358,251.20)	4,035,079.24	
Balance Before Actuarial Adjustments	44,870,878.87	17,829,243.76	104,756,224.01	167,456,346.64
Actuarial Adjustments		(2,940,464.99)	2,940,464.99	
Ending Balance 12/31/2016	44,870,878.87	14,888,778.77	107,696,689.00	167,456,346.64
Unrealized Appreciation				20,409,732.97
Total Assets (12/31/2016) (Market Value)				187,866,079.61



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
2017	279	377	656	158	431	589
2016	280	385	665	150	428	578
2015	269	381	650	150	424	574
2014	299	538	837	131	344	475
2013	298	544	842	120	327	447
2012	294	544	838	113	307	420
2011	273	541	814	113	299	412
2010	264	547	811	103	279	382
2009	240	542	782	97	268	365
2008	244	538	782	93	259	352



Schedule K

Changes in Plan Participation From January 1, 2016 to January 1, 2017

ACTIVE PARTICIPANTS

Number as of January 1, 2016		578
Changes During Plan Year:		
Retired	(-)	23
Terminated and Vested	(-)	4
Terminated	(-)	17
Died	(-)	0
New Participants	(+)	36
Number as of January 1, 2017		570

RETIRED PARTICIPANTS

Number as of January 1, 2016		578
Changes During Plan Year:		
Returned to Active Service	(-)	0
Died	(-)	19
New Retirements from Active Service	(+)	23
New Surviving Annuitants	(+)	4
Vested Terminated Participants Whose Benefits Commenced	(+)	3
Number as of January 1, 2017		589

TERMINATED VESTED PARTICIPANTS

Number as of January 1, 2016		87
Changes During Plan Year:		
Returned to Active Service	(-)	1
Terminated	(-)	1
Benefits Commenced	(-)	3
Died	(-)	0
New Termination's with Vesting	(+)	4
Number as of January 1, 2017		86



Schedule L

Age, Service and Average Salary Profile of the Active Members on January 1, 2017.

MALES -- FULL YEARS OF SERVICE TO JANUARY 1, 2017

<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	4	0	0	0	0	0	0	4	\$ 39,501
25-29	26	10	0	0	0	0	0	36	\$ 47,118
30-34	12	23	5	0	0	0	0	40	\$ 53,187
35-39	7	14	12	5	0	0	0	38	\$ 59,487
40-44	5	8	3	14	0	0	0	30	\$ 60,907
45-49	3	6	9	14	5	5	0	42	\$ 66,373
50-54	2	7	1	4	5	6	1	26	\$ 63,324
55-59	3	5	6	6	2	4	1	27	\$ 58,258
60-64	0	3	0	1	0	3	2	9	\$ 58,053
65 +	1	1	1	2	2	0	1	8	\$ 61,243
Total	63	77	37	46	14	18	5	260	\$ 58,034

Average Age: 42.09
Average Service: 11.32

FEMALES -- FULL YEARS OF SERVICE TO JANUARY 1, 2017

<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	3	0	0	0	0	0	0	3	\$ 41,823
25-29	17	4	0	0	0	0	0	21	\$ 46,029
30-34	12	15	9	0	0	0	0	36	\$ 47,365
35-39	10	9	7	3	0	0	0	29	\$ 50,505
40-44	9	6	5	10	4	0	0	34	\$ 51,969
45-49	6	10	10	12	10	3	2	53	\$ 50,654
50-54	5	7	7	11	12	8	3	53	\$ 55,045
55-59	0	9	9	14	5	4	4	45	\$ 50,997
60-64	2	1	5	6	1	7	5	27	\$ 50,411
65 +	0	2	2	2	1	1	1	9	\$ 46,744
Total	64	63	54	58	33	23	15	310	\$ 50,669

Average Age: 46.36
Average Service: 13.28

Schedule M

Actuarial Assumptions and Actuarial Cost Method for Funding Purposes, January 1, 2017.

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%
5 but less than 6	175%
6 or more	100%

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 (age - 30) x 3 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%



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, 1971.
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
1/40	2.500%	01/01/1971
1/60	1.667%	04/01/2009

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) 2.500% of 1/12th of Final Average Salary multiplied by years of credited service on the 1/40 Class,
- (b) 1.667% of 1/12th of Final Average Salary multiplied by years of credited service on the 1/60 Class for all participants hired on or after 04/01/2009,

PLUS

- (c) 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 1/40 Class must contribute between 9% and 19% of salary.

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

15. Deposit Administrator

Investment Managers:

The Vanguard Group

Twin Capital Management, Inc.

Custodian:

PNC Institutional Investments

Investment Consultant:

Bogdahn Consulting

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 ten times in the past from January, 1972 through January, 1997 and since then as follows:

PERCENTAGE/ANNUAL CHANGE IN C.P.I.	EFFECTIVE DATE OF INCREASE
85%	1/1/1998
85%	1/1/1999
85%	1/1/2000
100%	1/1/2001
100%	1/1/2003
100%	1/1/2004
100%	1/1/2005
100%	1/1/2006
100%	1/1/2007
100%	1/1/2008

18. Early Retirement Provision - The Retirement Board has authorized the following Early Retirement Provisions:

<u>Percent of Additional Service</u>	<u>Early Retirement Period</u>
20%	1/1/95 - 12/31/95



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>
2007	\$ 2,837,111	\$ 4,804,224	\$ 6,894,495	\$ 1,907	\$ 14,537,737
2008	2,915,351	4,712,669	(556,398)	0	7,071,622
2009	3,008,531	6,486,486	(657,790)	0	8,837,227
2010	3,215,066	6,095,561	8,375,059	0	17,685,686
2011	3,377,203	6,564,903	3,242,320	0	13,184,426
2012	3,574,018	6,860,358	7,828,492	0	18,262,868
2013	3,681,528	7,313,625	16,115,506	0	27,110,659
2014	3,374,588	6,152,213	15,762,233	0	25,289,034
2015	3,187,124	5,052,744	8,796,476	(63,967)	16,972,377
2016	3,231,334	5,474,488	8,984,899	0	17,690,721

EXPENSES BY TYPE

<u>Fiscal Year</u>	<u>Benefits</u>	<u>Refunds</u>	<u>Administrative/Miscellaneous</u>	<u>Total</u>
2007	\$ 5,077,901	\$ 534,100	\$ 680,708	\$ 6,292,709
2008	4,715,178	376,774	726,871	5,818,823
2009	6,068,085	319,928	669,637	7,057,650
2010	6,076,804	448,877	570,335	7,096,016
2011	5,803,804	171,311	487,732	6,462,847
2012	7,515,368	340,963	491,756	8,348,087
2013	7,685,968	284,710	332,365	8,303,043
2014	13,660,062	1,587,169	375,532	15,622,763
2015	10,628,198	150,569	338,575	11,117,342
2016	11,242,029	223,632	337,140	11,802,801