



CONSULTING GROUP



A DEFINED BENEFIT ACTUARIAL VALUATION

For:

Knox County Employee Benefit System Knox County Board of Education Retirement Plan

As of:

January 1, 2017

Prepared by:
USI Consulting Group



CONSULTING GROUP

March 15, 2017

CONFIDENTIAL

Ms. Kim Bennett
Executive Director
Knox County Retirement and Pension Board
City-County Bldg, Room 371
400 Main Street
Knoxville, TN 37902-2409

Re: Knox County Board of Education Retirement Plan

Dear Kim:

We are pleased to present our Actuarial Valuation Report for the Plan Year beginning January 1, 2017. A summary of the principal results of the report is provided for your convenience on pages one through three. Details supporting the cost calculations will be included in the GASB report that will be issued later this year.

The Actuarially Determined Contribution for the fiscal year is \$551,669 calculated as payable on July 1, 2017.

We would be happy to answer any questions you may have regarding this report.

Sincerely,

USI CONSULTING GROUP

A handwritten signature in black ink, appearing to read "Bob Cross".

Bob Cross, ASA, MAAA, FCA
President, Southeast and Midwest

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

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**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

VALUATION AS OF 1/1/2017

PRINCIPAL RESULTS OF THE VALUATION

Below is a summary of the principal results of this year's valuation compared with the previous valuation. Amounts for each valuation period reflect the actuarial cost method, assumptions and plan benefits in effect at that time.

	<u>As of January 1, 2016</u>	<u>As of January 1, 2017</u>
<u>CONTRIBUTION LIMITATIONS</u>		
Actuarially Determined Contribution	\$ 726,969	\$ 551,669
Expected Employee Contribution	\$ 0	\$ 0
<u>SUPPORTING INFORMATION</u>		
Market Value of Assets	\$ 59,928,360	\$ 57,734,604
Actuarial Value of Assets	\$ 60,724,857	\$ 59,378,498
Entry Age Normal Accrued Liability	\$ 71,594,594	\$ 68,983,539
Present Value of Accumulated Benefits	\$ 71,594,594	\$ 68,983,539
Funding Ratio – Actuarial Value of Assets as a Percentage of Present Value of Accumulated Benefits	84.8%	86.1%
Funding Ratio – Market Value of Assets as a Percentage of Present Value of Accumulated Benefits	83.7%	83.7%
Funding Ratio Discount Rate	7.0%	7.0%
Number of Lives Included in the Valuation	441	433
Present Value of All Future Benefits	\$ 71,594,594	\$ 68,983,539

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

VALUATION AS OF 1/1/2017

EXECUTIVE SUMMARY

Purpose and Scope

The principal purposes of this actuarial valuation report are:

1. To present our calculation of the Plan contributions under the Knox County Employee Benefit System Knox County Board of Education funding policy,
2. To review plan experience during the year ended December 31, 2016 and the funded status of the plan as of January 1, 2017.

The valuation is based upon employee data and financial information provided by Knox County. This data was not audited or otherwise verified by us other than for tests of reasonable consistency with prior year data.

Actuarial Methods and Assumptions

This valuation report is based on the cost method, assumptions, and plan provisions outlined on pages 11 through 16. The actuarially determined contribution is calculated in accordance with the Knox County Board of Education Retirement Plan funding policy. No changes have been made from the methods and assumptions used to produce last year's report.

In our opinion, all costs, liabilities, rates of interest and other factors under the plan have been determined on the basis of actuarial assumptions and methods, which are each reasonable, taking into account the experience of the plan in addition to future expectations and which, when combined, represent our best estimate of anticipated experience under the plan.

Plan Experience

During 2016, the market value of plan assets decreased from \$59,928,360 to \$57,734,604 with a net investment return of approximately 6.53%. This investment performance is below the 7.0% assumption, creating a market value loss of about \$269,000. On a gross return basis, there is a gain of approximately \$179,000 and this gain is used in the asset smoothing calculation. The actuarial value of plan assets decreased from \$60,724,857 to \$59,378,498 with a net investment return of approximately 7.91%. This resulted in an asset gain of about \$523,000. The plan also experienced a liability gain of approximately \$749,000. Most of this gain is a result of the actual cost of living adjustment for the past year (1.5% increase) being less than the 3% assumption. The net actuarial gain to the plan was about \$1,272,000.

Recall that the asset smoothing method recognizes each year's investment gains and losses over a five year period. See page 6 for more details of the method. In this way, the actuarial value of assets methodology smoothes out much of the volatility of annual changes in the market value of assets. Note that this year, the actuarial value of assets is greater than the market value of assets.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

VALUATION AS OF 1/1/2017

**EXECUTIVE SUMMARY
(Continued)**

Contribution Requirements

The actuarially determined contribution for the 2017 fiscal year is \$551,669, calculated as payable on July 1, 2017. Please see page 9 for more details.

Funding Policy

Actuarially determined contributions to the Plan are determined each year as part of the Actuarial Valuation process. These contributions are determined according to the following funding policy:

- | | |
|-------------------------|--|
| Actuarial Cost Method: | Entry Age Normal |
| Asset Valuation Method: | The asset smoothing method utilized for the BOE Plan shall be that investment gains or losses will be recognized over (5) years, providing that the actuarial value of assets shall not be greater than 110% of market value, nor less than 90% of market value. |
| Amortization Method: | The amortization policy shall be that the UAAL, as of January 1, 2014 and any changes thereafter as a result of a change in assumptions or methods or benefit or plan changes, shall be amortized over a fixed period of 19 years beginning January 1, 2014. The amortization period for experience gains and losses shall be 10 years from the date of the actuarial valuation. |

Funding Status

The plan's funding ratio, on an actuarial value of assets basis, as shown on page 1 increased from 84.8% in 2016 to 86.1% in 2017. Note that the funding ratio on a market value basis remained level at 83.7% for the 2017 plan year.

The funded ratio is appropriate for assessing the need for or the amount of future contributions, based on the assumptions stated in this report.

Future measurements may differ significantly from the information contained within this report. These measurements will be based on the market value of assets, which varies based on the underlying portfolio experience, as well as plan sponsor contributions, benefit payments and expenses paid from plan assets. Liability calculations will be produced in accordance with current census data, as well as the interest rates and mortality tables in effect at that time. There has been no analysis of potential future impacts associated with this report.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

VALUATION AS OF 1/1/2017

**EXECUTIVE SUMMARY
(Continued)**

This report has been prepared in accordance with generally accepted actuarial standards and procedures, and conforms to the Guidelines for Professional Conduct of the American Academy of Actuaries. It is based upon the employee and financial data submitted to USI Consulting Group by the plan sponsor and the retirement plan provisions as outlined herein.

The undersigned actuary is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

USI CONSULTING GROUP



Jaime Packer, ASA, EA, MAAA
Associate Vice President & Actuary



Diane Padernacht
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Dan Grosso
Actuarial Team Leader

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

FINANCIAL STATEMENT AS OF 1/1/2017

ASSETS	<u>1/1/2016</u>	<u>1/1/2017</u>
Cash and Cash Equivalent	(437,690)	(2,634,203)
Participants' Contributions Receivable	0	0
Interest Receivable	38,467	38,234
Investment Securities	(2,087,119)	2,342,516
Mutual Funds	54,719,145	50,096,689
Corporate Bonds	792,719	1,005,011
US Treasuries	3,967,724	4,082,611
Federal Agency Debt Securities	257,737	221,057
Federal Agency Mortgage	<u>2,751,202</u>	<u>2,648,578</u>
Total Assets	60,002,185	57,800,491
 LIABILITIES AND NET ASSETS		
Payables	73,825	65,887
Acquisition Indebtedness	0	0
Other Liabilities	<u>0</u>	<u>0</u>
Total Liabilities	73,825	65,887
NET ASSETS	59,928,360	57,734,604
 STATEMENT OF RECEIPTS AND DISBURSEMENTS		
Net Assets at Beginning of Year		59,928,360
Contributions Received or Receivable		
Employer	726,969	
Employees	1,953	
Others	0	
Total Contributions		728,922
Dividends and Income		209,616
Other Income		0
Net Realized Gain (Loss)		3,352,058
Net Unrealized Gain (Loss)		<u>593,661</u>
Total Income		4,884,257
Distribution of Benefits		
Directly to Participants or Beneficiaries	6,645,023	
Other	0	6,645,023
Fees and Commissions		123,697
Other Expenses		<u>309,293</u>
Total Expenses		7,078,013
Net Income (loss)		(2,193,756)
NET ASSETS AT END OF YEAR		57,734,604
 Net Investment Return		6.53%
Gross Investment Return		7.32%

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

DETERMINATION OF VALUATION ASSETS AS OF 1/1/2017

1. ASSET GAIN/(LOSS) AS OF 1/1/2017

(1) Expected market value of assets as of 1/1/2017:	
(a) Market value of assets as of 1/1/2016	\$ 59,928,360
(b) Expected return on assets at 7.0%	\$ 4,194,985
(c) Contributions	\$ 728,922
(d) Benefit Payments and Expenses	\$ (7,078,013)
(e) Net interest on (c) - (d), weighted for timing	<u>\$ (218,460)</u>
(f) Total: (a) + (b) + (c) + (d) + (e)	\$ 57,555,794
 (2) Actual Market value of assets as of 1/1/2017:	 \$ 57,734,604
 (3) Asset gain/(loss) as of 1/1/2017: (2) - (1)(f)	 \$ 178,810

2. DETERMINATION OF VALUATION ASSETS AS OF 1/1/2017

(1) Market value of assets as of 1/1/2017:		\$ 57,734,604	
 (2) Recognition of asset gain/(loss) over a five year period:			
<u>Year Ending</u>	<u>Asset</u>	<u>Portion Not</u>	<u>Amount</u>
<u>December 31</u>	<u>Gain/(Loss)</u>	<u>X Yet Recognized</u>	<u>= Deferred</u>
2016	\$ 178,810	4/5	\$ 143,048
2015	\$ (4,253,553)	3/5	\$ (2,552,132)
2014	\$ (305,728)	2/5	\$ (122,291)
2013	\$ 4,437,407	1/5	\$ 887,481
Total:			\$ (1,643,894)
 (3) Accrued contributions as of 1/1/2017:			 \$ 0
 (4) Valuation assets as of 1/1/2017: (1) - (2) + (3)			 \$ 59,378,498

3. VALUATION ASSETS AS OF 1/1/2017

(1) Valuation assets as of 1/1/2016: (1) + (2) + (3) + (4) + (5)	\$ 60,724,857
(2) Contributions, including receivables:	\$ 728,922
(3) Benefit payments:	\$ (6,645,023)
(4) Plan expenses:	\$ (432,990)
(5) Return on assets:	<u>\$ 5,002,732</u>
(6) Valuation assets as of 1/1/2017: (1) + (2) + (3) + (4) + (5)	\$ 59,378,498
(7) 110% of Market Value	\$ 63,508,064
(8) Final Actuarial Value of Assets, no more than (7)	\$ 59,378,498

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

VALUATION RESULTS AS OF 1/1/2017

1. PRESENT VALUE OF FUTURE BENEFITS

The value of all projected retirement, death, disability, and vested termination benefits expected to be paid to all current plan participants, discounted to the valuation date with interest, mortality, withdrawal, and disability decrements.

	<u>Lives</u>	<u>Retirement</u>	<u>Death</u>	<u>Withdrawal</u>	<u>Disability</u>	<u>Total</u>
Active	0	0	0	0	0	0
Terminated	0	0	0	0	0	0
Retired	<u>433</u>	<u>68,983,539</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>68,983,539</u>
Totals	433	68,983,539	0	0	0	68,983,539

2. ENTRY AGE ACCRUED LIABILITY

The portion of the present value of future benefit attributable to prior normal costs.

Active	0
Terminated	0
Retired	<u>68,983,539</u>
Total	68,983,539

3. ACTUARIAL VALUE OF ASSETS

59,378,498

4. UNFUNDED ACCRUED LIABILITY (2 - 3)

9,605,041

5. ENTRY AGE NORMAL COST

The amount required to fund the present value of benefits as a level percent of pay from entry age to retirement age.

A. Total Normal Cost	0
B. Expected Employee Contributions	<u>0</u>
C. Employer Normal Cost	0

The Normal Cost is zero because there are no active participants in the plan.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

DETERMINATION OF GAIN/LOSS AS OF 1/1/2017

1. ASSET GAIN/(LOSS) AS OF 1/1/2017

(1) Expected valuation assets as of 1/1/2017:	
(a) Valuation assets as of 1/1/2016	\$ 60,724,857
(b) Expected return on assets at 7.0%	\$ 4,250,740
(c) Contributions	\$ 728,922
(d) Benefit Payments	\$ (6,645,023)
(e) Net interest on (c) - (d), weighted for timing	\$ (203,561)
(f) Total: (a) + (b) + (c) + (d) + (e)	\$ 58,855,935
(2) Actual valuation assets as of 1/1/2017:	\$ 59,378,498
(3) Asset gain/(loss) as of 1/1/2017: (2) - (1)(f)	\$ 522,563

2. LIABILITY GAIN/(LOSS) AS OF 1/1/2017

(1) Expected EAN accrued liability as of 1/1/2017:	
(a) EAN accrued liability as of 1/1/2016	\$ 71,594,594
(b) Total normal cost	\$ 0
(c) Expected increase in liability at 7.0%	\$ 5,011,622
(d) Benefit Payments	\$ (6,645,023)
(e) Net interest on (c) - (d), weighted for timing	\$ (228,642)
(f) Total: (a) + (b) + (c) + (d) + (e)	\$ 69,732,551
(2) Actual EAN accrued liability as of 1/1/2017:	\$ 68,983,539
(3) Liability gain/(loss) as of 1/1/2017: (1)(f) - (2)	\$ 749,012

3. TOTAL GAIN/(LOSS) AS OF 1/1/2017

(1) Expected Unfunded Accrued Liability (UAL) as of 1/1/2017:	
(a) UAL as of 1/1/2016	\$ 10,869,737
(b) Total normal cost	\$ 0
(c) Expected increase in UAL at 7.0%	\$ 760,882
(d) Contributions	\$ (728,922)
(e) Net interest on (c) - (d), weighted for timing	\$ (25,081)
(f) Total: (a) + (b) + (c) + (d) + (e)	\$ 10,876,616
(2) Actual UAL accrued liability as of 1/1/2017:	\$ 9,605,041
(3) Total gain/(loss) as of 1/1/2017: (1)(f) - (2)	\$ 1,271,575

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

CONTRIBUTION REQUIREMENTS FOR PLAN YEAR ENDING DECEMBER 31, 2017

The Plan has an Unfunded Accrued Liability using the Individual Entry Age Normal cost method. The Actuarially Determined Contribution will be the Plan's Normal Cost reduced by Expected Employee Contributions (see pg. 7) plus a 16 year amortization of the Past Service Base in effect on January 1, 2017 (see below) plus amortizations of prior years' experience gain or loss (see pg. 8).

ACTUARIALLY DETERMINED EMPLOYER CONTRIBUTION

CHARGES:

(1) Employer Normal Cost		0
(2) Outstanding Charge Base	9,605,041	
(3) Amortization of Outstanding Charge Base		<u>533,319</u>
(4) Total Charges = (1) + (3)		533,319
(5) Interest Charge on (1) and (3)		18,350

Annual Contributions

	<u>2016</u>	<u>2017</u>
Total Actuarially Determined Employer Contribution as of Beginning of the Plan Year	702,787	533,319
Total Actuarially Determined Employer Contribution as of Beginning of fiscal year starting July 1	726,969	551,669
Expected Employee Contributions for the Plan Year	0	0

AMORTIZATION SCHEDULE

Description

	Year Est.	Initial Amount	Outstanding Balance	Amortization Payment	Years Remaining
Past Service Base	2013	18,652,856	16,600,227	1,642,300	16.0
(Gain)/Loss Base	2014	(4,106,438)	(3,150,924)	(546,415)	7.0
(Gain)/Loss Base	2015	(2,191,686)	(1,863,328)	(291,633)	8.0
(Gain)/Loss Base	2016	(743,453)	(689,643)	(98,926)	9.0
Balancing Base	2016	(19,079)	(17,700)	(2,539)	9.0
(Gain)/Loss Base	2017	(1,271,575)	(1,271,575)	(169,200)	10.0
Balancing Base*	2017	(2,016)	<u>(2,016)</u>	<u>(268)</u>	10.0
			9,605,041	533,319	

* The excess contributions (plus interest) of \$2,016 creates a 'gain' that lowers the amortization base and therefore decreases the Actuarially Determined Contribution for the current plan year.

Note: The 2013 Past Service Base was refreshed in 2014.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

PARTICIPANT DATA AS OF 1/1/2017

Active employees under assumed retirement age	
Number	0
Expected total annual compensation	N/A
Average accrued benefit	N/A
Average projected benefit	N/A
Average attained age	N/A
Average prior service	N/A
Other active and inactive employees	
Number	0
Average accrued benefit	N/A
Average attained age	N/A
Terminated deferred vested, deceased and disabled employees	
Number	0
Average accrued benefit	N/A
Average attained age	N/A
Retired employees, beneficiaries and contingent annuitants	
Number	433
Average monthly benefit	1,286.81
Average attained age	73.38

RECONCILIATION OF PARTICIPANT STATUS

	<u>Active</u>	<u>Inactive</u>	<u>Deferred Vested</u>	<u>Pay Status</u>	<u>Total</u>
Prior Valuation	1	0	0	440	441
Terminated - vested	0	0	0	0	0
Cashed Out	0	0	0	0	0
Death	0	0	0	(10)	(10)
Entered as Beneficiary	0	0	0	2	2
Retired	(1)	0	0	1	0
Rehired	0	0	0	0	0
Beneficiary Payments Cease	0	0	0	0	0
Data Corrections	0	0	0	0	0
Current Valuation	0	0	0	433	433

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

SUMMARY OF PLAN PROVISIONS

Effective Date Shall mean for credited service July 1, 1987 and for all other purposes June 26, 1990.

Eligibility
Participation Any person who is a “teacher” as defined by the Court of Appeals in its opinion of December 30, 1987 in the case of Knox County v. The City of Knoxville, et al, and who is entitled to maintain membership in a local pension system as a result of their membership in any applicable plan of the City of Knoxville Pension System on June 30, 1987, and who thereafter is employed as a result of the City of Knoxville ceasing to operate a separate school system and is so regularly employed by the Knox County Board of Education.

Normal Retirement
Eligibility Each member shall be eligible to retire at age 62 or on the first day of any of the thirty-five months next following age 62.

Benefit A monthly benefit payable for life, computed as of normal retirement date as one-twelfth of credited service multiplied by the sum of (A) and (B):

(A) Benefit Rate A times average base earnings

(B) Benefit Rate B times average excess earnings

Benefit Rate A and Benefit Rate B shall vary according to the member’s last birthday at time benefit payments are to commence, as follows:

Age	Benefit Rate A	Benefit Rate B
62 or earlier	0.75%	1.50%
63	0.78%	1.58%
64	0.84%	1.66%
65 or later	0.88%	1.76%

This amount is then reduced by the benefit accrued under the applicable City of Knoxville retirement plan as of June 30, 1987.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

**SUMMARY OF PLAN PROVISIONS
(Continued)**

Minimum Benefit	The monthly benefit, including 50% of the primary Social Security benefit, shall not be less than \$10 per year of credited service, with a maximum of \$250.
Earnings	Total compensation
Base Earnings	That part of earnings in any calendar year which does not exceed \$4,800.00 per annum.
Excess Earnings	That part of earnings in any calendar year which are in excess of base earnings.
Credited Service	Years and completed calendar months of service as an employee of either the City of Knoxville or Knox County.
Average Earnings	A 3-year arithmetic average determined for the number of full calendar years of credited service during which the earnings were the highest, or number of full calendar years actually completed if less than 3.
Accrued Benefit	Normal retirement benefit based on service and compensation up to the determination date less that benefit accrued under the applicable City of Knoxville retirement plan as of June 30, 1987.
Early Retirement	
Eligibility	Completion of 25 years of credited service.
Benefit	Upon early retirement, a member may elect to receive either (a) a deferred monthly benefit equal to his accrued benefit commencing at normal retirement date, or (b) a reduced benefit equal to the actuarially equivalent benefit described in (a) above, commencing immediately.
Disability Not In Line of Duty	
Eligibility	Completion of 15 years of credited service.
Benefit	Accrued benefit, based on credited service at time of disablement, payable immediately, plus a lump sum equal to six times the accrued monthly benefit.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

**SUMMARY OF PLAN PROVISIONS
(Continued)**

Disability in Line of Duty

Eligibility	Disablement in the course of performance of duty as an employee.
Benefit	Accrued benefit, based on credited service projected to age 62, payable immediately and reduced by any workers' compensation benefits paid.

Death Benefit

Eligibility	Completion of 15 years of credited service.
Benefit	50% of the monthly benefit that the participant would have been entitled to if he/she had elected the 50% joint and survivor form of payment, payable at the earliest time benefits could have commenced to the participant.

Deferred Vested

Eligibility	Completion of 10 years of credited service.
Benefit	A deferred monthly benefit equal to the accrued benefit commencing at normal retirement date, determined as of the date of termination, provided the member leaves his contributions in the fund.

Return of Employee Contribution

A minimum of employee contributions with interest is paid on death, termination, or retirement.

Normal Form of Annuity

Life Annuity

Optional Forms of Annuity

Certain and Life, Joint and Survivor, Cash Refund. Such options will be actuarially equivalent to a life annuity.

Employee Contributions

Each employee who is a member shall contribute to the fund an amount equal to (a) plus (b) where:

(a) The contribution rate shall be 3 percent of base earnings, and

(b) The contribution rate shall be 5 percent of excess earnings.

Cost of Living Increase

Currently the plan provides for increases to the monthly benefit amounts paid to retirees. The amount of the increase is tied to cost of living with an annual maximum of 3%.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

ACTUARIAL COST METHOD

Individual Entry Age Normal Cost.

Under this method, the annual cost is equal to the normal cost, plus amortization of unfunded accrued liabilities over a fixed period of years selected within the minimum (10 years) and maximum (5 to 30 years) periods permitted by law.

The normal cost is the sum of individual normal costs, determined as a level percentage of compensation which would have been necessary to fund the employee's projected retirement, death and withdrawal benefits, from entry age (the age at which the employee would have entered the plan had it been in effect on his employment date), to his retirement age. Thus, the dollar normal cost is expected to increase with the salary projection assumption.

The actuarial accrued liability is the accumulation, based on the actuarial assumptions, of all assumed prior normal costs. Thus, it represents the amount of reserves, which would be held by the plan, had it always been in effect for the present group of participants and had plan experience followed that predicted by the actuarial assumptions. The unfunded accrued liability is the excess, if any, of the accrued liability over the plan assets.

Actuarial gains and losses arising from differences between plan experience and that predicted by the actuarial assumptions, as measured by the difference between actual and expected unfunded accrued liabilities, are amortized over 10 years.

ATTRIBUTION PARAMETERS

The plan has no active participants.

ACCRUED AND VESTED BENEFITS

Vested benefits are based on the plan document's vesting schedule based on years of service. Please refer to the Summary of Plan Provisions section of this report for requirements for particular benefits.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

**SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS
(Continued)**

ACTUARIAL ASSUMPTIONS

Post-Retirement

Mortality – 1983 Group Annuity Mortality Table for Males and Females, no mortality improvement scale is applied.

There is no mortality improvement assumed at this time. The most recent experience study illustrates that the current mortality assumption, with no future improvement scale, is appropriate for the plan's population. This assumption will continue to be monitored in future studies and updated as needed.

Investment Return – 7.0% per annum.

Assumed benefit increases – 3.00% per annum on the participant's original benefit, based on plan provisions

Pre-Retirement

Mortality – N/A – All participants are retired.

Salary projection – N/A

Expense loading – None

Long-Term Inflation – This assumption is an underlying component of a number of these economic assumptions. This assumption reflects consumer price indices, forecasts of inflation, yields on government securities of various maturities, and yields on nominal and inflation-indexed debt.

Retirement age – N/A

Disability rates – N/A

Withdrawal rates – N/A

The actuarial assumptions used in the January 1, 2017 valuation were based on the results of an actuarial experience study prepared in 2012 based on data from January 1, 2002 through December 31, 2011.

An experience study will be performed during the 2017 plan year and any adjustments to the assumptions will be made starting with the January 1, 2018 report.

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

**SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS
(Continued)**

ASSET VALUATION

Each plan year's investment gain or loss is recognized over five years, subject to a 10% corridor around the market value of assets.

Investment Return – 7.0% per annum. The return reflects the anticipated gross long-term rate of return on plan assets based on the plan's current and expected future asset portfolio, as supported by the plan's investment manager. The following was the Board's adopted asset allocation policy as of December 31, 2016:

<u>Asset Class</u>	<u>Percentage</u>
Domestic Equity	27.50%
International Equity	27.50%
Public Real Estate	3.00%
Private Real Estate	7.00%
Core Fixed Income	15.00%
TIPS	5.00%
High Yield	15.00%
Total Assets	100%

**KNOX COUNTY EMPLOYEE BENEFIT SYSTEM
KNOX COUNTY BOARD OF EDUCATION RETIREMENT PLAN**

ACCUMULATED PLAN BENEFITS UNDER FASB ASC 960

Actuarial Present Values of Accumulated Plan Benefits (Accumulated Benefit Obligation):	<u>1/1/2016</u>	<u>1/1/2017</u>
Vested Benefits		
Participants currently receiving payments	71,123,501	68,983,539
Other Participants		
Active Employees	471,093	0
Deceased and Disabled Employees	0	0
Deferred Vested Terminated Employees	0	0
Total - Other Participants	<u>471,093</u>	<u>0</u>
Total Vested Benefits	71,594,594	68,983,539
Nonvested Benefits	<u>0</u>	<u>0</u>
Total Actuarial Present Values of Accumulated Plan Benefits	71,594,594	68,983,539
Statement of Changes in Actuarial Present Value of Accumulated Plan Benefits		
Actuarial Present Value of Accumulated Plan Benefits - 1/1/2016		71,594,594
Increase (Decrease) Attributable to:		
Interest Due to Change in the Discount Period		4,782,979
Benefits Paid		(6,645,023)
Assumption Change		0
Plan Amendment		0
Benefits Accumulated and Actuarial Experience Different From That Assumed		<u>(749,011)</u>
Actuarial Present Value of Accumulated Plan Benefits - 1/1/2017		68,983,539
Discount Rate	7.00%	7.00%