



**Cavanaugh Macdonald**  
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**Report of the Actuary on the  
Annual Valuation of the Shelby  
County Government Retiree  
Health and Life Insurance Plans**

**Prepared as of June 30, 2017**





# Cavanaugh Macdonald

CONSULTING, LLC

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November 27, 2017

Board of Trustees  
Shelby County Government Retiree Health  
and Life Insurance Plans  
160 North Main Street, Suite 850  
Memphis, TN 38103

Members of the Board:

Governmental Accounting Standards Board Statements (GASB) No. 43 and No. 45 require actuarial valuations of retiree health care and other post-employment benefit plans. We are submitting the results of the actuarial valuation of the Shelby County Government's (the County) Retiree Health and Life Insurance Plans (the Plan) prepared as of June 30, 2017. While not verifying the data at the source, the actuary performed tests for consistency and reasonability. The valuation indicates that the Annual Required Contribution (ARC) under GASB Statements No. 43 and No. 45 is \$9,129,451, or 3.72% of active covered payroll, payable for the fiscal year ending June 30, 2017.

The promised medical, drug, and life insurance benefits of the Plan are included in the actuarially calculated contribution rates which were developed using the entry age normal actuarial cost method. GASB requires the discount rate used to value a plan be based on the likely return of the assets held in trust to pay benefits. As of June 30, 2017, the Plan has assets in a trust solely to provide benefits to retirees and their beneficiaries. As such, the valuation is based on an assumed discount rate of 5.25%. Based on historical contributions to a qualified trust in the amount of the ARC and analysis performed on the asset investment mix, the use of a valuation discount rate higher than 5.25% may be supported. The unfunded accrued liability is being amortized by regular annual contributions as a level dollar amount within a 20-year period, on the assumption that the amortization period will decrease by one each subsequent year.

The unfunded accrued liability decreased significantly when compared to the prior valuation. One reason for this decrease is that the assets performed very well during the year, with a return of more than 13%. Another reason is that health care costs (premium amounts) for the Aetna (Medicare) participants that were expected to increase by 5.75% did not increase at all and costs for the Cigna (pre-Medicare) participants were expected to increase by 7.75% but only increased by 3.72%. Another reason is due to a change in demographics; that is, the count of inactive (retirees and spouses) with health insurance coverage decreased.

The assumptions recommended by the actuary are in the aggregate reasonably related to the prior experience and to reasonable expectations of anticipated experience under the Plan and meet the parameters for the disclosures under GASB Statements No. 43 and No. 45. Since the previous valuation, changes have been made to the assumed initial per capita costs of health care, the assumed rates of health care inflation used to project the per capita health care costs and the assumed participation for spouses of male retirees. Also, the normal cost now includes an assumption for administrative expenses.

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This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries and meet the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the health care plans and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the Plan.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

Respectfully submitted,

A handwritten signature in blue ink that reads 'Edward J. Koebel'.

Edward J. Koebel, EA, FCA, MAAA  
Principal and Consulting Actuary

A handwritten signature in blue ink that reads 'Bradley R. Wild'.

Bradley R. Wild, ASA, FCA, MAAA  
Actuary

EJK/BRW:brw



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Shelby County Government Retiree Health and Life Insurance Plans

**SECTION I - SUMMARY OF PRINCIPAL RESULTS**

1. For convenience of reference, the principal results of the valuation are summarized below:

Valuation Date	June 30, 2017	June 30, 2016
Active members:		
Number	5,011	5,100
Annualized Compensation	\$245,415,321	\$244,518,118
Retired members and beneficiaries:		
Number of Retirees		
Health Insurance	1,497	1,601
Life Insurance	2,682	2,672
Total*	<u>2,974</u>	<u>2,792</u>
Number of Covered Spouses	457	548
Number of Surviving Spouses	<u>209</u>	<u>226</u>
Total	3,640	3,566
Assets:		
Market Value	\$232,120,856	\$199,169,337
Actuarial Value	\$232,120,856	\$199,169,337
Unfunded Actuarial Accrued Liability (UAAL)	\$46,675,092	\$104,286,468
Amortization Period (Years)	20	21
Funding Ratio	84.14%	65.63%
<b>Fiscal Year Ending</b>	<b>June 30, 2018</b>	<b>June 30, 2017</b>
Annual Required Contribution (ARC) in Dollars:		
Normal Cost	\$5,644,553	\$6,137,405
UAAL	<u>3,484,898</u>	<u>7,580,061</u>
Total	\$9,129,451	\$13,717,466
ARC as a Percent of Active Covered Payroll:		
Normal Cost	2.30%	2.51%
UAAL	<u>1.42%</u>	<u>3.10%</u>
Total	3.72%	5.61%
Discount Rate	5.25%	5.25%

\*Not all retirees with health insurance benefits participate in the Life Insurance Plan and not all retirees with life insurance benefits participate in the Health Insurance Plan.



**SECTION I - SUMMARY OF PRINCIPAL RESULTS (CONTINUED)**

2. The valuation indicates that the Annual Required Contribution (ARC) under GASB Statement No. 43 and GASB Statement No. 45 is \$9,129,451, or 3.72% of active covered payroll payable for the fiscal year ending June 30, 2017. Actual net claims and net premiums paid on behalf of retirees may be treated as employer contributions in relation to the ARC. Comments on the valuation results as of June 30, 2017 are given in Section IV and further discussion of the contribution levels is set out in Sections V and VI.
3. The last valuation was performed as of June 30, 2016. The following changes have been made since the previous valuation:
  - To reflect recent experience of the Retiree Health Insurance Plan:
    - The assumed initial per capita costs of health care were revised to reflect the Plan's health care offerings effective January 1, 2017.
    - The assumed rates of health care inflation used to project the per capita health care costs were revised.
    - The assumed rate of participation of spouses of future retirees.
4. The unfunded accrued liability decreased significantly when compared to the prior valuation. One reason for this decrease is that the assets performed very well during the year, with a return of more than 13%. Another reason is that health care costs (premium amounts) for the Aetna (Medicare) participants that were expected to increase by 5.75% did not increase at all and costs for the Cigna (pre-Medicare) participants were expected to increase by 7.75% but only increased by 3.72%. Another reason is due to a change in demographics; that is, the count of inactives (retirees and spouses) with health insurance coverage decreased.
5. Schedule D of this report outlines the full set of actuarial assumptions and methods employed in the current valuation.
6. The valuation takes into account the Plan as in effect June 30, 2017.



**SECTION II - MEMBERSHIP DATA**

Data regarding the membership of the Plan for use as a basis of the valuation were furnished by the County. Schedule B provides detailed information regarding the membership data.

**SECTION III - ASSETS**

As of June 30, 2017, the total market value of assets amounted to \$232,120,856, as reported by the auditor. The estimated investment return for the plan year was 13.18%. Schedule C shows the receipts and disbursements of the Plan for the year preceding the valuation date and a reconciliation of the Plan balances at market value.

**SECTION IV - COMMENTS ON VALUATION**

1. Schedule A of this report outlines the results of the actuarial valuation. The results are shown based upon a discount rate of 5.25%, assuming the County will fund the OPEB liability in advance. The valuation was prepared in accordance with the actuarial assumptions and the actuarial cost method, which are described in Schedule D.
2. Since the previous valuation, the assumed initial per capita costs of health care, the assumed rates of health care inflation used to project the per capita health care costs and the assumed rate of participation of spouses of future male retirees have been revised to reflect recent experience. The normal cost includes an assumption for administrative expenses.



**SECTION IV - COMMENTS ON VALUATION (CONTINUED)**

3. The valuation shows the Plan has an actuarial accrued liability of \$151,600,770 for benefits expected to be paid on account of the present active membership, based on service to the valuation date. The liability on account of benefits payable to retirees and retiree spouses amounts to \$127,195,178. The total actuarial accrued liability of the Plan amounts to \$278,795,948. Against these liabilities, the Plan has present assets for valuation purposes of \$232,120,856. Therefore, the unfunded actuarial accrued liability is equal to \$46,675,092.

**SECTION V - CONTRIBUTIONS PAYABLE UNDER THE PLAN**

1. The actuarially determined employer contribution rates based on the June 30, 2017 actuarial valuation are shown in the following table.

<b>Annual Required Contribution Rate (ARC)</b>		
<b>Component</b>	<b>% of Active Covered Payroll:</b>	<b>Dollar Amount</b>
Normal Cost	2.30%	\$5,644,553
Accrued Liability	<u>1.42%</u>	<u>3,484,898</u>
Total	3.72%	\$9,129,451

2. The valuation indicates a normal contribution of \$5,644,553, or 2.30% of total active covered payroll, is required to meet the cost of benefits currently accruing. Estimated budgeted administrative expenses are included in the normal cost rate.
3. The unfunded actuarial accrued liability amounts to \$46,675,092 as of the valuation date. An accrued liability contribution of \$3,484,898, or 1.42% of total active covered payroll, is sufficient to amortize the unfunded actuarial accrued liability over a 20-year period, based on a 5.25% investment rate of return and level dollar amortization.
4. The total Annual Required Contribution is, therefore, \$9,129,451, or 3.72% of total active covered payroll.



**SECTION VI - COMMENTS ON LEVEL OF FUNDING**

The valuation indicates that a recommended employer contribution of \$9,129,451, or 3.72% of covered payroll, is required to meet the parameters established under GASB Statements No. 43 and No. 45. This corresponds to a contribution required to meet the cost of benefits currently accruing and provide for the amortization of the unfunded actuarial accrued liability over a period of 20 years.

**SECTION VII - ACCOUNTING INFORMATION**

1. Governmental Accounting Standards Board Statements No. 43 and No. 45 set forth certain items of required supplementary information to be disclosed in the financial statements of the Plan and the employer. One such item is the distribution of the number of employees by type of membership, as shown in the following table.

<b>Number of Active and Retired Members As of June 30, 2017</b>	
Actives	5,011
Retirees	
Health Insurance	1,497
Life Insurance	2,682
Total*	<u>2,974</u>
Covered spouses	457
Surviving spouses	<u>209</u>
Total	<u>3,640</u>
Total	8,651

\*Not all retirees with health insurance benefits participate in the Life Insurance Plan and not all retirees with life insurance benefits participate in the Health Insurance Plan.



Shelby County Government Retiree Health and Life Insurance Plans

**SECTION VII - ACCOUNTING INFORMATION (CONTINUED)**

2. Another such item is the Schedule of Funding Progress, as shown in the following table.

Schedule of Funding Progress						
Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)** (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b - a) / c)
7/1/2009*	45,847,000	303,390,000	257,543,000	15.11	248,298,000	103.72
7/1/2010*	61,592,000	322,954,000	261,362,000	19.07	253,977,000	102.91
7/1/2011*	88,232,000	320,558,000	232,326,000	27.52	252,878,000	91.87
6/30/2012	105,471,758	410,937,835	305,466,077	25.67	241,767,204	126.35
6/30/2013	133,454,082	389,781,193	256,327,111	34.24	249,503,836	102.73
6/30/2014	177,594,759	312,691,527	135,096,768	56.80	239,751,560	56.35
6/30/2015	197,900,076	299,697,092	101,797,016	66.03	243,154,660	41.87
6/30/2016	199,169,337	303,455,805	104,286,468	65.63	244,518,118	42.65
6/30/2017	232,120,856	278,795,948	46,675,092	83.26	245,415,321	19.02

\*Results prior to 6/30/2012 were reported by the prior actuary.

\*\*Results prior to 6/30/2014 were determined using the Projected Unit Credit cost method.

3. Following is information to assist the County in the calculation of the Annual OPEB Cost (AOC) and the Net OPEB Obligation (NOO) for the fiscal year ending June 30, 2017.

Annual OPEB Cost and Net OPEB Obligation	
Fiscal Year Ending June 30, 2017	
(a) Employer Annual Required Contribution	\$13,717,466
(b) Valuation Discount Rate	5.25%
(c) Interest on Net OPEB Obligation: (i) * (b)	(\$738,772)
(d) Amortization Factor	13.2022
(e) Adjustment to Annual Required Contribution: (i) / (d)	(\$1,065,872)
(f) Annual OPEB Cost: (a) + (c) - (e)	\$14,044,566
(g) Employer contributions for Fiscal Year ending June 30, 2016	\$15,873,291
(h) Change in Net OPEB Obligation/(Asset): (f) - (g)	(\$1,828,725)
(i) Net OPEB Obligation/(Asset) at beginning of Fiscal Year	(\$14,071,851)
(j) Net OPEB Obligation/(Asset) at end of Fiscal Year: (h) + (i)	(\$15,900,576)



**SECTION VII - ACCOUNTING INFORMATION (CONTINUED)**

Trend Information				
Fiscal Year Ending	Annual OPEB Cost (AOC)	Actual Contributions	Percentage of AOC Contributed	Net OPEB Obligation (NOO)
6/30/2009	\$31,600,000	\$18,329,123	58.00%	\$ 5,269,835
6/30/2010	29,007,000	20,611,575	71.06	13,665,260
6/30/2011	30,122,000	24,850,458	82.50	18,936,802
6/30/2012	26,928,000	31,914,109	118.52	13,950,693
6/30/2013	32,983,376	29,266,521	88.73	17,667,548
6/30/2014	28,942,589	36,731,249	126.91	9,912,490
6/30/2015	15,616,289	31,445,399	201.36	(5,916,620)
6/30/2016	13,110,694	21,265,925	162.20	(14,071,851)
6/30/2017	14,044,566	15,873,291	113.02	(15,900,576)

4. The information presented in the required supplementary schedules was determined as part of the actuarial valuation as of June 30, 2017. Additional information as of the latest actuarial valuation follows.

Valuation date	June 30, 2017	
Actuarial cost method	Entry Age Normal	
Amortization method	Level Dollar, Closed	
Remaining amortization period	20 Years	
Asset valuation method	Market Value of Assets	
Actuarial assumptions:		
Investment Rate of Return*	5.25%	
Projected Salary Increases*	2.75% - 5.75%	
*Includes inflation at	2.75%	
	<u>Pre-Medicare</u>	<u>Medicare</u>
Health care cost trend rate	7.75%	5.75%
Ultimate trend rate	5.00%	5.00%
Year of Ultimate trend rate	2023	2020

The assumed investment rate of return reflects the fact that assets are set aside within the County that are legally held exclusively for retiree health care and life insurance benefits.



**SECTION VII - ACCOUNTING INFORMATION (CONTINUED)**

5. On June 2, 2015, GASB Statement No. 74 and GASB Statement No. 75 (GASB 74 and 75) were unanimously adopted by the GASB Board. The disclosure requirements of GASB 74 and 75 will be similar to the disclosure requirements for pension benefits under GASB Statement No. 67 and GASB Statement No. 68. GASB 74 relates to accounting disclosures for plan sponsors and, as such, replaces GASB 43 beginning with fiscal years ending June 30, 2017. GASB 75 relates to accounting disclosures for contributing employers and, as such, replaces GASB 45 beginning with fiscal years ending June 30, 2018. GASB 74 and 75 will require applicable OPEB plan sponsors and contributing employers to disclose the net OPEB liability on the statement of financial position and book an accounting expense based upon the entry age normal actuarial cost method. Beyond the use of a specified actuarial cost method, GASB's new disclosure standards will also require the discount rate used to calculate liabilities to be based upon the yield of 20-year, tax-exempt municipal bonds and the expected rate of return on plan assets, to the extent plan assets are projected to be available for the payment of future benefits. Additionally, GASB 74 and 75 will bring about many other changes in the liability valuation and accounting disclosure processes currently in place which are expected to significantly impact data collection, timing, and effort. As details for the new GASB OPEB disclosure standards emerge, planning and coordination between plan sponsors, contributing employers, actuaries, and auditors is recommended.



**SCHEDULE A – RESULTS OF THE VALUATION**

	Participant Medical	Spouse Medical	Participant Life Insurance	Total
1 Payroll	\$245,415,321	N/A	N/A	\$245,415,321
2 Actuarial Present Value of Future Benefits (PVFB)				
Present value of prospective benefits payable in respect of:				
(a) Present active members	\$105,638,323	\$41,604,671	\$39,850,936	\$187,093,930
(b) Pre-Medicare: Present retired members and spouses, if applicable	24,147,729	10,336,950	1,146,726	\$35,631,405
(c) Medicare: Present retired members and spouses, if applicable	<u>\$26,122,309</u>	<u>\$11,108,105</u>	<u>\$54,333,359</u>	<u>\$91,563,773</u>
(d) Total	\$155,908,361	\$63,049,726	\$95,331,021	\$314,289,108
3 Actuarial Accrued Liability (AAL)				
Present value of prospective benefits payable in respect of:				
(a) Present active members	\$84,565,005	\$32,498,014	\$34,537,751	\$151,600,770
(b) Pre-Medicare: Present retired members and spouses, if applicable	24,147,729	10,336,950	1,146,726	\$35,631,405
(c) Medicare: Present retired members and spouses, if applicable	<u>26,122,309</u>	<u>11,108,105</u>	<u>54,333,359</u>	<u>\$91,563,773</u>
(d) Total	\$134,835,043	\$53,943,069	\$90,017,836	\$278,795,948
4 Present Assets for Valuation Purposes*	<u>\$112,261,408</u>	<u>\$44,912,099</u>	<u>\$74,947,349</u>	<u>\$232,120,856</u>
5 Unfunded Actuarial Accrued Liability (UAAL) [(3d) – (4)]	\$22,573,635	\$9,030,970	\$15,070,487	\$46,675,092
6 Normal Contribution	\$3,214,941	\$1,325,243	\$1,104,369	\$5,644,553
7 UAAL Contribution*				
(a) Present active members	1,062,035	399,196	433,137	\$1,894,368
(b) Pre-Medicare: Present retired members and spouses, if applicable	303,266	126,976	14,381	\$444,623
(c) Medicare: Present retired members and spouses, if applicable	<u>328,065</u>	<u>136,449</u>	<u>681,393</u>	<u>\$1,145,907</u>
(d) Total	1,693,366	662,620	1,128,911	\$3,484,898
8 Annual Required Contribution (ARC) [(6) + (7)]	\$4,908,307	\$1,987,863	\$2,233,280	\$9,129,451
9 ARC as a Percent of Total Payroll [(8) ÷ (1)]	2.00%	0.81%	0.91%	3.72%
10 Expected Benefit Payments	\$6,447,650	\$1,786,414	\$3,152,177	\$11,386,241
11 ARC as a Percent of Expected Benefit Payments [(8) ÷ (10)]	76.13%	111.28%	70.85%	80.18%

\*For the purposes of these metrics, assets were allocated to the AAL based upon the aggregate funding ratio.



**SCHEDULE A – RESULTS OF THE VALUATION (CONTINUED)**

<b>Projected Net Benefit Cash Flows</b>	
<b>Year Ending</b>	<b>Total</b>
6/30/2018	\$11,386,241
6/30/2019	\$12,605,144
6/30/2020	\$13,708,896
6/30/2021	\$14,690,287
6/30/2022	\$15,487,559
6/30/2023	\$16,503,692
6/30/2024	\$17,616,809
6/30/2025	\$18,704,040
6/30/2026	\$19,576,278
6/30/2027	\$20,082,598



**SCHEDULE B – MEMBERSHIP DATA EXHIBITS**

Distribution of Active Members As of June 30, 2017										
Attained Age	Years of Service to Valuation Date									Totals
	Less than 1 Year	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 or more	
Under 25	41	15	0	0	0	0	0	0	0	56
25 - 29	112	222	17	0	0	0	0	0	0	351
30 - 34	78	223	106	11	1	0	0	0	0	419
35 - 39	65	145	114	91	45	0	0	0	0	460
40 - 44	39	115	94	125	185	31	1	0	0	590
45 - 49	31	108	110	134	241	130	43	0	0	797
50 - 54	28	95	87	107	198	134	164	28	0	841
55 - 59	16	66	62	76	145	103	129	55	15	667
60 - 64	11	38	55	60	84	64	79	58	30	479
65 - 69	5	19	18	49	52	39	34	34	12	262
70 & Over	2	5	16	11	17	11	14	9	4	89
<b>Totals</b>	428	1,051	679	664	968	512	464	184	61	5,011

Statistics for Active Members As of June 30, 2017		
Number	Average Age	Average Service
5,011	47.7	13.1



**SCHEDULE B – MEMBERSHIP DATA EXHIBITS (CONTINUED)**

Distribution of Inactive Members As of June 30, 2017					
Age	Health Care				Life Insurance
	Retirees	Covered Spouses	Surviving Spouses	Total	
Under 50	10	14	1	25	22
50-54	51	27	0	78	114
55-59	139	46	2	187	284
60-64	269	61	11	341	472
65-69	277	80	18	375	600
70-74	284	112	30	426	503
75-79	213	72	45	330	325
80 & Over	254	45	102	401	362
<b>Totals</b>	1,497	457	209	2,163	2,682

Statistics for Inactive Members As of June 30, 2017		
	Average Age	
	Health Care	Life Insurance
Service Retirees	70.0	68.9
Disabled Retirees	66.8	66.0
Covered Spouses	68.4	n/a
Surviving Spouses	79.3	n/a



Shelby County Government Retiree Health and Life Insurance Plans

**SCHEDULE C - PLAN ASSETS**

GASB Statement No. 43 and No. 45 define plan assets as resources, usually in the form of stocks, bonds, and other classes of investments, that have been segregated and restricted in a trust, or equivalent arrangement, in which (a) employer contributions to the plan are irrevocable, (b) assets are dedicated to providing benefits to retirees and their beneficiaries, and (c) assets are legally protected from creditors of the employers or plan administrator, for the payment of benefits in accordance with the terms of the plan.

As of June 30, 2017, the total market value of assets amounted to \$232,120,856, as reported by the auditor.

<i>Receipts</i>	
(1) Retiree Contributions	\$ 6,310,326
(2) Employer Contributions	15,873,291
(3) Other Revenue	22,231
(4) Net Investment Income	<u>26,639,833</u>
(5) Total Receipts	\$ 48,845,681
<i>Disbursements</i>	
(6) Benefit Payments	\$ 14,865,282
(7) Administrative Expenses	<u>536,864</u>
(8) Total Disbursements	\$ 15,402,146
(9) Excess of Receipts Over Disbursements: (4) - (8)	\$ 33,443,535
<i>Reconciliation of Asset Balances</i>	
(10) Market Value at June 30, 2016	\$ 199,169,337
(11) Adjustment	(492,016)
(12) Adjusted Market Value at June 30, 2016	198,677,321
(13) Excess of Receipts Over Disbursements	<u>33,443,535</u>
(14) Market Value at June 30, 2017	\$ 232,120,856
(15) Estimated Rate of Return on Market Value of Assets	13.18%



**SCHEDULE D - OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS**

**VALUATION DATE:** June 30, 2017

**DISCOUNT RATE:** 5.25% per annum (net of investment expenses), compounded annually.

This valuation was prepared for Governmental Accounting Standards Board (GASB) financial reporting purposes. In this report, the assumed discount rate was 5.25% per annum, compounded annually and was the assumption used by the prior actuary for all prior valuations. While a discount rate of 5.25% may not be unreasonable, it is recommended the discount rate be reviewed using a process based upon GASB pronouncements and actuarial standards of practice.

Under GASB Statements No. 43 and No. 45, the discount rate for an advanced-funded OPEB plan should be the blended rate that reflects the proportionate amounts of plan and employer assets expected to be used to pay benefits. As such, the blended rate should be based upon a plan's funding goals (as outlined in a plan's funding policy and/or historical contribution practices), the long-term expected rate of return on plan assets, and the long-term expected rate of return on employer assets. If a plan's funding policy is to pay the annual required contribution (as determined using the long-term expected rate of return on plan assets), producing a funded plan over the long-term, then plan assets are expected to be used, and the long-term expected rate of return on plan assets may be appropriate. A discount rate lower than the long-term expected rate of return on plan assets may indicate contributions to be made over the long-term will be less than the annual required contribution (as determined using the long-term expected rate of return on plan assets).

The Actuarial Standards Board has issued Actuarial Standard of Practice (ASOP) No. 27, "Selection of Economic Assumptions for Measuring Pension Obligations", which provides guidance to actuaries in selecting economic assumptions for measuring obligations under defined benefit plans. Under the guidance provided by ASOP No. 27, an analysis was performed in 2013 using the investment manager's capital market assumptions and target asset allocations for the Shelby County OPEB Trust. This analysis estimated the expected range of long-term (50 year) rates of return on plan assets to be:

- 25th Percentile: 6.26%
- 50th Percentile: 7.28%
- 75th Percentile: 8.30%

As of June 30, 2017, the Plan's funding ratio (assets as a percent of liabilities) was 84.14%. As the Plan currently determines the annual required contribution (ARC) using level dollar amortization with a closed amortization period that is currently 20 years, the continued payment of the ARC (a combination of current service costs and an amount to pay off the unfunded liability) should result in a funded plan over the long-term.

**EXPENSES:** Estimated budgeted administrative expenses of 0.24% of payroll are added to the normal cost rate.

**ACTUARIAL METHOD:** Costs were determined using the Entry Age Normal (EAN) Actuarial Cost Method. Under this method, a calculation is made for post-employment benefits to determine the uniform and constant percentage rate of employer contribution that, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required to meet the cost of all benefits payable on the member's behalf.

**ASSET VALUATION METHOD:** Market value of assets.



**SCHEDULE D - OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS (CONTINUED)**

**HEALTH CARE COST TREND RATES:** Following is a chart detailing the trend assumptions applied to annual per capita health care costs and contributions.

Year Beginning July 1	Medical and Prescription Cost Trend	
	CIGNA Plans	Medicare Supplement Plans
2017	7.75%	5.75%
2018	7.00%	5.50%
2019	6.50%	5.25%
2020	6.00%	5.00%
2021	5.50%	5.00%
2022	5.25%	5.00%
2023 and beyond	5.00%	5.00%

**AGE RELATED MORBIDITY:** Per capita health care costs are adjusted to reflect expected cost changes related to age. The increase to the net incurred claims was assumed to be:

Participant Age	Annual Increase
< 30	0.0%
30 - 34	1.0%
35 - 39	1.5%
40 - 44	2.0%
45 - 49	2.6%
50 - 54	3.3%
55 - 59	3.6%
60 - 64	4.2%
65 - 69	3.0%
70 - 74	2.5%
75 - 79	2.0%
80 - 84	1.0%
85 - 89	0.5%
90 and over	0.0%

**SPOUSE COVERAGE IN HEALTH CARE PLANS:** Use of actual census data and current plan elections for spouses of current retirees. For spouses of future retirees and current retirees for whom spouse date of birth was not provided but are indicated as married with Family coverage, it is assumed that female spouses are three years younger than males. We have assumed all current retirees with family coverage and indicated as married cover a spouse.

**ANTICIPATED MEDICARE PART A COVERAGE:** It is assumed that 100% of future retirees hired on or after April 1, 1986 are eligible for premium-free Medicare Part A. It is assumed that 5% of future retirees hired prior to April 1, 1986 are ineligible for premium-free Medicare Part A.



**SCHEDULE D - OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS (CONTINUED)**

**ANTICIPATED PLAN PARTICIPATION:** The assumed annual rates of future retiree participation and election of spouse coverage are as follows:

Participant	Health Care		Life Insurance
Retiree	<i>Years of Service at Retirement</i>		95%
	Less than 7.5	20%	
	7.5 – 10	35%	
	11 – 15	45%	
	16 – 19	55%	
	20 or more	75%	
Spouse	<i>Spouse's Gender</i>		n/a
	Female	50%	
	Male	15%	

**ANTICIPATED PLAN ELECTIONS:** The assumed rates of coverage elections for current retirees under age 65 and future retirees are as follows:

Plan	Applicability	Election Rate
CIGNA HMO	Under Age 65	92%
CIGNA HRA Standard	Under Age 65	8%
AETNA Standard	Age 65 or Older and With Part A Coverage	76%
AETNA Premium	Age 65 or Older and With Part A Coverage	24%
AETNA Standard Med	Age 65 or Older and With No Part A Coverage	76%
AETNA Premium Med	Age 65 or Older and With No Part A Coverage	24%

**ANNUAL EXPECTED MEDICAL/RX CLAIMS (MEDICAL AND RX ARE AGE ADJUSTED TO AGE 65):**

Following is a chart detailing expected medical and prescription claims age adjusted to age 65 for adult coverage for the year following the valuation date. The assumed health care claims costs are based on the premium rates provided by the County and are assumed to include administrative expenses.

AETNA				CIGNA	
With Medicare Part A		Without Medicare Part A		HMO	HRA Standard
Standard	Premium	Standard	Premium		
\$1,149	\$2,677	\$5,129	\$7,001	\$16,035	\$7,401



**SCHEDULE D - OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS (CONTINUED)**

**SALARY INCREASES:**

Service	Increase per year
Less than 5	5.75%
5-9	4.75
10-14	4.25
15-19	3.75
20-24	3.25
25 or more	2.75

**SEPARATIONS FROM SERVICE:** Representative values of the assumed rates of death, disability, withdrawal, service retirement and early retirement are as follows:

**Plan A**

Age	Annual Rate of					
	Death*		Disability*		Withdrawal	Retirement
	Male	Female	Male	Female		
20	0.0231%	0.0128%	0.100%	0.200%	14.00%	
25	0.0306	0.0150	0.100	0.200	14.00	
30	0.0557	0.0239	0.100	0.200	10.00	
35	0.0850	0.0390	0.100	0.200	7.00	
40	0.1063	0.0530	0.130	0.230	5.50	
45	0.1341	0.0817	0.146	0.310	4.50	
50	0.1852	0.1206	0.450	0.500	4.50	
55	0.3264	0.2528	0.720	0.800	5.00	6.0%
60	0.6690	0.5129	0.950	1.000	7.00	7.0
65	1.2562	0.9664	1.150	1.200	7.00	22.0
67	1.6010	1.1861	1.150	1.200	7.00	100.0

\*90% of deaths and disabilities are assumed to be non-hazardous duty.



Shelby County Government Retiree Health and Life Insurance Plans

**SCHEDULE D - OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS (CONTINUED)**

**Plan B**

Age	Annual Rate of							
	Death*		Disability*		Withdrawal	Retirement		
	Male	Female	Male	Female		General		Deputy Sheriff
					Male	Female		
20	0.0231%	0.0128%	0.100%	0.200%	14.00%			
25	0.0306	0.0150	0.100	0.200	14.00			
30	0.0557	0.0239	0.100	0.200	10.00			
35	0.0850	0.0390	0.100	0.200	7.00			
40	0.1063	0.0530	0.130	0.230	5.50	3.43%	11.50%	
45	0.1341	0.0817	0.146	0.310	4.50	2.10	7.45	
50	0.1852	0.1206	0.450	0.500	4.50	10.00	10.00	
55	0.3264	0.2528	0.720	0.800	5.00	15.00	15.00	15.0%
57	0.4395	0.3461	0.812	0.880	5.80	3.00	3.00	3.0
60	0.6690	0.5129	0.950	1.000	7.00	20.00	20.00	100.0
65	1.2562	0.9664	1.150	1.200	7.00	100.00	100.00	100.0
70	2.0825	1.6391	1.150	1.200	7.00	100.00	100.00	100.0

\*75% of deaths and disabilities are assumed to be line-of-duty for deputy sheriffs. 10% of deaths and disabilities are assumed to be line-of-duty for general employees.

**Plan C**

Age	Annual Rate of							
	Death*		Disability*		Withdrawal	Retirement**		
	Male	Female	Male	Female		Less than 25 years of service	25 or more years of service	
					Public Safety		Non-Public Safety	
20	0.0231%	0.0128%	0.100%	0.200%	14.00%			
25	0.0306	0.0150	0.100	0.200	14.00			
30	0.0557	0.0239	0.100	0.200	10.00			
35	0.0850	0.0390	0.100	0.200	7.00			
40	0.1063	0.0530	0.130	0.230	5.50		12.0%	20.0%
45	0.1341	0.0817	0.146	0.310	4.50		12.0	20.0
50	0.1852	0.1206	0.450	0.500	4.50		12.0	20.0
55	0.3264	0.2528	0.720	0.800	5.00	7.0%	12.0	20.0
60	0.6690	0.5129	0.950	1.000	7.00	7.0	12.0	20.0
62	0.8729	0.6747	1.030	1.080	7.00	10.0	100.0	20.0
65	1.2562	0.9664	1.150	1.200	7.00	12.0	100.0	20.0
67	1.6010	1.1861	1.150	1.200	7.00	100.0	100.0	100.0

\*90% of deaths and disabilities are assumed to be non-hazardous duty.



**SCHEDULE D - OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS (CONTINUED)**

**Plan D**

Age	Annual Rate of						
	Death*		Disability*		Withdrawal	Retirement	
	Male	Female	Male	Female		Public Safety	Non-Public Safety
20	0.0231%	0.0128%	0.100%	0.200%	14.00%		
25	0.0306	0.0150	0.100	0.200	14.00		
30	0.0557	0.0239	0.100	0.200	10.00		
35	0.0850	0.0390	0.100	0.200	7.00		
40	0.1063	0.0530	0.130	0.230	5.50		
45	0.1341	0.0817	0.146	0.310	4.50		
50	0.1852	0.1206	0.450	0.500	4.50	7.0%	
55	0.3264	0.2528	0.720	0.800	5.00	10.0	
60	0.6690	0.5129	0.950	1.000	7.00	100.0	
62	0.8729	0.6747	1.030	1.080	7.00	100.0	7.0%
65	1.2562	0.9664	1.150	1.200	7.00	100.0	10.0%
67	1.6010	1.1861	1.150	1.200	7.00	100.0	10.0
70	2.0825	1.6391	1.150	1.200	7.00	100.0	100.0

\*90% of deaths and disabilities are assumed to be non-hazardous duty.

**DEATHS AFTER RETIREMENT:** The RP-2000 Combined Mortality Table set forward three years for males and set forward one year for females and using a Scale AA projection to 2025 is used for the period after retirement and for dependent beneficiaries. The RP-2000 Disabled Mortality Table set forward 6 years for males and set forward 9 years for females and using a Scale AA projection to 2015 is used for the period after disability retirement. Representative values of the assumed rates of death after service and disability retirement are as follows:

Age	Annual Rate of Death After			
	Service Retirement		Disability Retirement	
	Male	Female	Male	Female
50	0.1852%	0.1206%	2.7972%	1.6058%
55	0.3264	0.2528	3.2604	2.3581
60	0.6690	0.5129	4.0993	3.2776
65	1.2562	0.9664	5.3291	4.5353
70	2.0825	1.6391	6.9314	6.2883
75	3.6640	2.5332	9.3519	8.3148
80	6.9785	4.2601	12.7610	11.7874
85	12.6336	7.4311	17.9791	16.7020



**SCHEDULE E - SUMMARY OF MAIN PLAN PROVISIONS**  
**AS INTERPRETED FOR VALUATION PURPOSES**

**ELIGIBILITY AND BENEFITS**

At the time of retirement, participating employees of the County qualify for retiree health care benefits (including their spouses and current dependents) and life insurance coverage (if hired on or prior to June 11, 2007) under the Plan. Eligible participants are required to be receiving a benefit from the System.

Covered spouses, dependents, and survivors qualify for health care benefits at the same contribution level as the member.

Pension plan specific eligibility and benefits are as follows:

Pension Plan A

Retirement: Employees who retire at age 65 regardless of amount of credited service or age 55 with at least 7.5 years of credited service will receive health care and life insurance benefits for life. Spouses of retirees may be covered at the retirees' option, provided the election is made on the date the employee leaves active service.

Termination: Current employees who terminate employment and are not eligible for a retirement or disability benefit are not eligible for health care or life insurance benefits at retirement. Some current deferred vested retirees were grandfathered and are receiving health care and life insurance benefits.

Disability: Employees who become disabled at any age receive health care and life insurance benefits for life. Spouses of retirees may be covered at the retirees' option, provided the election is made on the date the employee leaves active service.

Death: Spouses of employees who die during active service with at least 7.5 years of credited service but less than 15 years will receive health care benefits for two years. Spouses of employees who die during active service with at least 15 years of credited service will receive health care benefits for two years followed by an option to continue health care benefits for life (if the surviving spouse elects to commence pension benefits) or to defer health care benefits to age 65 (if the surviving spouse elects to defer commencement of pension benefits).

Pension Plan B

Retirement: Employees who retire with at least 25 years of credited service or at age 60 (age 55 if Deputy Sheriff) and 10 years of credited service will receive health care and life insurance benefits for life. Spouses of retirees may be covered at the retirees' option, provided the election is made on the date the employee leaves active service.

Termination: Since all Pension Plan B participants are currently eligible for service retirement, termination benefits are not applicable.

Disability: Employees who become disabled at any age receive health care and life insurance benefits for life. Spouses of retirees may be covered at the retirees' option, provided the election is made on the date the employee leaves active service.

Death: Spouses of employees who die during active service will receive health care benefits for life.



**SCHEDULE E - SUMMARY OF MAIN PLAN PROVISIONS**  
**AS INTERPRETED FOR VALUATION PURPOSES (CONTINUED)**

**ELIGIBILITY AND BENEFITS (CONTINUED)**

Pension Plan C

Retirement: Employees hired on or before June 11, 2007 who retire with at least 25 years of credited service or at age 65 or at age 55 with at least 7.5 years of credited service will receive health care and life insurance benefits for life. Spouses of retirees may be covered at the retirees' option, provided the election is made on the date the employee leaves active service. Employees hired after June 11, 2007 who retire with at least 25 years of credited service or at age 65 or at age 55 with at least 15 years of credited service will receive health care benefits in the form of Medicare Supplement benefits upon becoming eligible for Medicare. Spouses of retirees may be covered at the retirees' option, provided the spouse is participating in the active employee health care plan on the date the employee leaves active service and the election is made on the date the employee leaves active service.

Termination: Current employees who terminate employment and are not eligible for a retirement or disability benefit are not eligible for health care or life insurance benefits at retirement. Some current deferred vested retirees were grandfathered and are receiving health care and life insurance benefits.

Disability: Employees hired on or before June 11, 2007 who become disabled at any age receive health care and life insurance benefits for life. Spouses of these retirees may be covered at the retirees' option, provided the election is made on the date the employee leaves active service. Employees hired after June 11, 2007 who become disabled at any age receive health care benefits for life. Spouses of these retirees may be covered at the retirees' option, provided the election is made on the date the employee leaves active service.

Death: Spouses of employees who die during active service with at least 15 years of credited service will receive health care benefits for life.

Pension Plan D

Retirement: General employees who retire at age 62 with at least 15 years of credited service will receive health care benefits in the form of Medicare Supplement benefits upon becoming eligible for Medicare. Public safety employees who retire at age 50 with at least the last 20 years of credited service being in a public safety classification, or at age 55 with at least 15 years of credited service, will also receive health care benefits in the form of Medicare Supplement benefits upon becoming eligible for Medicare. Spouses of retirees may be covered at the retirees' option, provided the spouse is participating in the active employee health care plan on the date the employee leaves active service and the election is made on the date the employee leaves active service.

Termination: Current employees who terminate employment and are not eligible for a retirement or disability benefit are not eligible for health care or life insurance benefits at retirement.

Disability: Employees who become disabled at any age receive health care benefits for life. Spouses of retirees may be covered at the retirees' option, provided the election is made on the date the employee leaves active service.

Death: Spouses of employees who die during active service with at least 15 years of credited service will receive health care benefits for life.



**SCHEDULE E - SUMMARY OF MAIN PLAN PROVISIONS  
AS INTERPRETED FOR VALUATION PURPOSES (CONTINUED)**

**COST OF COVERAGE**

*Monthly Health Care Contributions*

Participation in the Plan requires retirees, survivors, covered spouses, and dependents to pay a percentage of the premium based on service at retirement according to the chart below:

Years of Service at Retirement	Retiree Contribution Percentage				
	CIGNA Plans	With Medicare Part A		Without Medicare Part A	
		Aetna Standard	Aetna Premium	Aetna Standard	Aetna Premium
Less than 7.5	100%	100%	100%	100%	100%
7.5 - 10	60%	50%	78%	25%	43%
11 - 15	50%	45%	76%	22%	41%
16 - 19	40%	40%	74%	20%	40%
20 or more	30%	30%	70%	15%	36%

The following chart details the monthly health care premiums for retirees, spouses, and dependents as of January 1, 2017.

Medical Coverage Tier	AETNA			
	With Medicare Part A		Without Medicare Part A	
	Standard	Premium	Standard	Premium
Single	\$120.42	\$279.79	\$494.54	\$ 655.08
Single + Spouse	240.84	559.58	989.08	1,310.16

CIGNA		
Medical Coverage Tier	HMO	HRA Standard
Single	\$ 1,059.44	\$ 501.72
Family	2,118.87	1,070.93

*Monthly Life Insurance Premiums*

Eligible retirees covered under the self-insured program pay monthly premiums for retiree life insurance coverage in the amount of \$0.13 per \$1,000 of life insurance coverage.

**MEDICAL CENTER RETIREES**

Based on the direction of the County, those former Medical Center retirees who have been identified by the County as eligible for health insurance benefits have a liability included in this report, but no liability has been valued for life insurance benefits, as any liability for life insurance benefits is assumed to be a liability to the Medical Center.



**SCHEDULE F - 10-YEAR PROJECTION OF FUNDING  
RATIO AND EMPLOYER CONTRIBUTION RATES**

The results of actuarial valuations are a “snapshot” of the financial position on the valuation date, based on the assumed number of active employees and current beneficiaries. Projections simulate future actuarial valuation results over a forecast period (ten years in this case) by “creating” future new hires and performing valuations using the projected membership. The following items are assumed for the projected results provided on the following page.

- Active Employee Growth Rate: 0%
- Valuation Discount Rate: 5.25%
- Investment Rate of Return: 5.25% each year
- Actuarial Value of Assets: Market Value of Assets
- Amortization Method: Level Dollar, Closed
- June 30, 2017 Amortization Period: 20 Years
- Future Contributions: Based on Expected Actuarially Required Contributions

All other demographic and economic changes are assumed to occur in accordance with the actuarial assumptions used for the actuarial valuation.



**SCHEDULE F - 10-YEAR PROJECTION OF FUNDING RATIO AND EMPLOYER CONTRIBUTION RATES (CONTINUED)**

