

City Of Beckley, West
Virginia
Firemen's Pension and
Relief Fund

**Actuarial Valuation Report
for the Year Beginning July 1, 2017**



August 27, 2018

Mr. Billie L. Trump
City Treasurer, Recorder
409 S. Kanawha Street
Beckley, WV 25801

Lt. Ernest W. Parsons, Jr.
Pension Board Secretary
City of Beckley Firemen's Pension and Relief Fund

**Subject: City of Beckley Firemen's Pension and Relief Fund
Actuarial Valuation Report for the Year Beginning July 1, 2017**

Dear Mr. Trump and Lt. Parsons, Jr.:

Upon the request of the Municipal Pensions Oversight Board, we have performed an actuarial valuation as of July 1, 2017, for the City of Beckley, West Virginia Firemen's Pension and Relief Fund ("Fund" or "Plan"). This actuarial valuation has been performed in accordance with the West Virginia Code Chapter 8, Article 22, Sections 16 through 28, inclusive.

In accordance with West Virginia Code §8-22-20, this actuarial valuation report provides information on:

- The sponsor's funding requirements for the fiscal year ending June 30, 2019, based on the selected funding policy, i.e. the Alternative funding policy as defined in West Virginia Code §8-22-20(c)(1)
- The Fund's eligibility to receive an allocation of the premium tax for the fiscal year ending June 30, 2019
- The Fund's eligibility to provide supplemental benefits for the plan year beginning July 1, 2019

This report also provides illustrative projections under two other funding policies available to the sponsor – the Optional funding policy as defined in West Virginia Code §8-22-20(e), and the Conservation funding policy as defined in West Virginia Code §8-22-20(f).

West Virginia Code §8-22-20 (c)(4), requires (1) a review of the actuarial assumptions and methods at least once every five years and (2) that the Actuary shall provide a report to the oversight board with recommendations on any changes to the actuarial process. Consequently, an experience review was performed for the period July 1, 2009, through June 30, 2014. The assumptions and methods were recommended by the actuary, in the report *2016 Experience Review for the Years July 1, 2009, to July 1, 2014*, approved by the Municipal Pensions Oversight Board, and became effective for the actuarial valuation as of July 1, 2015.

This actuarial valuation is based upon:

Plan Member Data – Data for active members and persons receiving benefits from the Fund as of June 30, 2017, was provided by the Fund's staff. We have tested this data for reasonableness.

Asset Values – A reconciliation of market value of assets during the plan year ended June 30, 2017, and a list of assets held as of June 30, 2017, by investment category, were provided by the Fund.

Plan Provisions – A summary of the key plan provisions valued are set forth in Section VII of the report: Summary of Principal Plan Provisions.

Actuarial Methods – Fund liabilities were measured using the Entry-Age Normal Actuarial Cost Method. The actuarial valuation was based on the market value of assets. The actuarial methods used in the actuarial valuation are set forth in Section VI of the report: Actuarial Assumptions and Methods.

Actuarial Assumptions – The actuarial assumptions used include a discount rate of 4.50%. The actuarial assumptions used in the actuarial valuation are set forth in Section VI of the report: Actuarial Assumptions and Methods.

The actuarial valuation results disclosed in this report are based on the data and actuarial assumptions and methods described above, and upon the provisions of the Plan as of the actuarial valuation date. Based on these items, we certify these results to be true and correct.

To the best of our knowledge, this actuarial statement is complete and accurate, and has been prepared in accordance with generally accepted actuarial principles and practices.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

This report should not be relied on for any purpose other than the purpose stated.



Mr. Billie L. Trump and Lt. Ernest W. Parsons, Jr.
City of Beckley Firemen's Pension and Relief Fund
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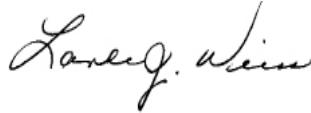
The signing actuaries are independent of the plan sponsor.

Alex Rivera and Lance J. Weiss are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

Sincerely,



Alex Rivera, FSA, EA, MAAA, FCA
Senior Consultant



Lance J. Weiss, EA, MAAA, FCA
Senior Consultant



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SECTION I

ACTUARIAL VALUATION RESULTS AS OF JULY 1, 2017

Executive Summary

Upon the request of the Municipal Pensions Oversight Board (MPOB), we have performed an actuarial valuation as of July 1, 2017, for the City of Beckley, West Virginia Firemen's Pension and Relief Fund ("Fund" or "Plan").

In accordance with West Virginia Code §8-22-20, this actuarial valuation report provides information on:

- The sponsor's funding requirements for the fiscal year ending June 30, 2019
- The Fund's eligibility to receive an allocation of the premium tax for the fiscal year ending June 30, 2019
- The Fund's eligibility to provide supplemental benefits for the plan year beginning July 1, 2019

This report is based on the sponsor's election to finance benefit obligations using the Alternative funding policy as defined in West Virginia Code §8-22-20 (c)(1).

The key features of the Alternative funding policy, effective as of June 30, 1991, are summarized below:

- The sponsor's initial Alternative contribution effective for plan year 1991 is the greater of 107% of the amount contributed for the plan year ended June 30, 1990, or the highest five-year average of contributions made since 1984.
- Sponsor contributions made in subsequent years cannot be less than 107% of the contribution made in the prior fiscal year.
- The actuary must certify in writing that the Fund is projected to be solvent under the Alternative funding policy for the next consecutive 15-year period. A plan is deemed to be solvent if projected assets are greater than zero over the 15-year projection period.
- Beginning September 1, 2003, any municipality which elected the Alternative funding policy has the option of reverting to the Standard funding policy if the plan's funded ratio is greater than 80%. In this case, the Standard minimum contribution equals the normal cost plus the amortization of the unfunded liability over a period of not more than 40 years commencing from July 1, 1991, less the allocable portion of the state premium tax fund for municipal pension and relief funds.
- Plan members hired before January 1, 2010, contribute 7.0% of pay; however, if elected by the Board of Trustees of the Plan, member contributions may be increased up to 9.5% of pay. Employees hired on or after January 1, 2010, contribute 9.5% of pay.
- The Plan also receives premium tax allocation assigned to the Fund for the plan year.

This report also provides illustrative projections under two other funding policies available to the sponsor – the Optional funding policy as defined in West Virginia Code §8-22-20(e), and the Conservation funding policy as defined in West Virginia Code §8-22-20(f).

Executive Summary (Continued)

The following table provides the Plan's funded status:

Funded Status as of:	July 1, 2017
Assets	\$17,744,129
Actuarial Accrued Liability	\$46,089,126
Unfunded Actuarial Accrued Liability	\$28,344,997
Funded Ratio	38.50%

The following table provides the employer contributions for the fiscal year ended June 30, 2018, under the Alternative funding policy:

Employer Contributions for FYE:	June 30, 2018
FYE 06/30/2017 Alternative Contribution	\$629,462
7% Increase in Alternative Contribution	\$44,062
FYE 06/30/2018 Alternative Contribution	\$673,524
Additional Contribution	\$0
Final FYE 06/30/2018 Alternative Contribution	\$673,524

The following table provides the estimated employer contributions for the fiscal year ending June 30, 2019, under the Alternative funding policy:

Estimated Employer Contributions for FYE:	June 30, 2019
FYE 06/30/2018 Alternative Contribution	\$673,524
7% Increase in Alternative Contribution	\$47,147
FYE 06/30/2019 Alternative Contribution	\$720,671
Additional Contribution to satisfy 15-year Solvency Test on an Open Group Basis (to receive 100% of the State Premium Tax Allocation)	\$0
Estimated Employer Contribution for FYE 06/30/2019 to receive 100% of the State Premium Tax Allocation	\$720,671
Additional Contribution to satisfy 15-year Solvency Test on a Closed Group Basis (to grant Supplemental Benefits; i.e. COLA increases)	\$0
Estimated Employer Contribution for FYE 06/30/2019 to receive 100% of the State Premium Tax Allocation and to grant Supplemental Benefits; i.e. COLA increases	\$720,671

Executive Summary (Continued)

A sponsor using the Alternative funding policy must satisfy the solvency test, as referenced in West Virginia Code section §8-22-20 (c)(1) in order to receive 100% of the State premium tax allocation, or grant Supplemental Benefits to plan members. We understand that the minimum requirement to satisfy the statutory solvency test includes a demonstration that the assets are projected to be greater than zero over a 15-year period. The statutes also require that an actuary perform the projection and certify the solvency test. However, the statutes provide little guidance on the parameters used to perform the solvency projections.

Under the current minimum statutory requirements, a sponsor of a poorly funded plan could provide Supplement Benefits to members, effectively deplete assets over a 15-year period, and have no available assets reserved to pay the benefits of current or future retirees after the 15-year period. For this reason, we recommend performing projections that include a margin for conservatism and satisfy the minimum statutory requirement for solvency. For this purpose we recommend performing projections that assume contributions for members hired after the actuarial valuation date will not be used to finance the unfunded liabilities of current members as of the actuarial valuation date. That is, assets and liabilities associated with new plan members are excluded from the solvency projections used to certify the solvency test for purposes of providing Supplemental Benefits. In this report projections that exclude new members are called “Closed Group Projections.”

The statutes also require that the Plan satisfy the solvency test in order to receive the State premium tax allocation. For this purpose we recommend using less conservatism in the projections in order to ensure that the Plan receives the greatest allowable State premium tax allocation. A projection that includes assets and liabilities for members hired after the actuarial valuation would be less conservative. In this report projections that include new members are called “Open Group Projections.”

The sponsor is projected to satisfy the 15-year solvency test without making additional annual contributions in excess of the minimum alternative contribution.

Executive Summary (Continued)

Commentary on Premium Tax Allocation

Under §8-22-19 of the West Virginia Code, the plan sponsor is required to deposit the statutory contribution on a monthly basis at a rate of one-twelfth of the annual requirement, in order to receive the premium tax allocation from the Municipal Pensions Security Fund. Revenues which are specifically collected for the Fund, including employee payroll contributions, must be deposited within five days of receipt.

Based upon discussions with the MPOB, we understand the annual premium tax allocation is determined by September 1st each year. Municipalities can begin invoicing the MPOB for their share of the premium tax allocation after receiving their state provided actuarial study and after the municipality has made employer contributions to the local Plan. Each municipal treasurer shall use the invoice template provided by the MPOB to begin drawing down the state allocation for the municipal pension plan. This July 1, 2017, Actuarial Report from GRS is to be used by municipal pension plans to draw down the September 1, 2018 State Premium Tax Allocation which is allocated in Fiscal Year 2019. The actuarial valuation and projection results assume the sponsor will make the statutory contributions on a monthly basis in accordance with statutes, including any additional amounts needed to satisfy the 15-year solvency test on an open group projection basis, and will be eligible to receive the premium tax allocation.

Commentary on Solvency Projections and Supplemental Benefits

Under § 8-22-26a of the West Virginia Code, all retirees, surviving spouses, and disabled pensioners are eligible for Supplemental Benefits that include automatic cost-of-living benefits commencing on the first day of July following two years of retirement. The benefit equals the percentage increase in the Consumer Price Index, limited to 4.0 percent (2.0 percent for certain disabled pensioners), multiplied by the sum of the allowable amount (first \$15,000 of initial benefits paid) and the accumulated supplemental pensions paid in prior years.

The Court of Appeals decision requires that Supplemental Benefits be provided on “the allowable amount of the first \$15,000 of the total annual pension paid in addition to the accumulated supplemental pension from the previous years.” The decision implies that compound cost-of-living increases should be applied to both the allowable amount of \$15,000 and the accumulated supplemental pension amounts for prior years. Additional Supplemental Benefits are payable only if the Plan satisfies the minimum standard for actuarial soundness as defined in West Virginia Code § 8-22-20. This minimum standard requires that the fund remain “solvent” over the next 15-year projection period. Based on discussions with the West Virginia Municipal Pensions Oversight Board, and our understanding of the administrative practices of other local police and fire pension funds in West Virginia, the “solvency” requirement generally means that the fund’s market value of assets is projected to be greater than zero for all plan years prior to the end of the 15-year projection period. The projection is based on the most recent actuarial valuation and assumes the plan sponsor will make contributions according to the funding policy elected by the sponsor as defined by West Virginia Code, including any additional amounts needed to satisfy the 15-year solvency test on a closed group projection basis. Although the 15-year solvency test may satisfy the minimum standard for actuarial soundness under the statutes, it is not necessarily consistent with generally accepted actuarial principles.

Executive Summary (Continued)

The Supplemental benefits for plan year beginning July 1, 2019 will be based on the Consumer Price Index for calendar year 2018, and the projected results of the July 1, 2017 actuarial valuation.

Additional Remarks on the Actuarial Valuation Results

Following are additional remarks on the actuarial valuation results as of July 1, 2017:

- The actuarial assumptions and methods were recommended by the actuary, in the report *2016 Experience Review for the Years July 1, 2009, to July 1, 2014*, and approved by the Municipal Pensions Oversight Board and became effective beginning with the actuarial valuation as of July 1, 2015. The key actuarial assumptions are fully disclosed in Section VI of the report.
- The interest rate used to discount liabilities remained the same for the July 1, 2016 and July 1, 2017 actuarial valuations.
 - The interest rate assumption was developed by reviewing the Plan's current funded ratio, the 15-year projected funded ratio, the ratio of assets to benefits, the percentage of assets allocated to equities and the funding policy selected. The details of the methodology used to select the discount rate are presented in Section VI of the report. As of July 1, 2017, the Plan's funded ratio of 44% (using a testing interest rate of 5.50% for all plans using the Alternative funding policy), ratio of assets to benefits of 8.69, equity allocation of 58%, and 15-year projected funded ratio of 39%, resulted in a discount rate assumption of 4.50%.
- The Fund experienced an approximate annualized return of 8.36% on the market value of assets during the plan year ended June 30, 2017, which compares to the expected annualized return of 4.50%. The difference in actual versus expected return produced an asset (gain)/loss of (\$640,640).
- An actuarial valuation is based on the expectation of certain events such as salary increases, retirement, disability, mortality, termination, and cost of living increases. Demographic or liability experience (gains)/losses are generated when the actual occurrence of such events differs from the expectation. During the plan year ended June 30, 2017, the fund experienced a net liability (gain)/loss of (\$99,719) due to these events.

Alternative Funding

Following are additional remarks on the actuarial valuation projections under the current funding policy.

Based on the open group projections shown in Table 2, page II-2 and assuming that the sponsor makes the statutory required contributions, if all actuarial assumptions are realized in the future, including an investment return of 4.50%:

- The funded ratio is projected to decrease from 38% at June 30, 2017, to 29% at June 30, 2029, and then increase slowly to 88% at 2057.
- Employer contributions are expected to increase from \$673,524 (or 31% of pay) for the fiscal year end June 30, 2018, to 9,425,853 (or 106% of pay) for fiscal year end June 30, 2057.

Please note that a funded ratio of only 38% at June 30, 2017, means that the plan is underfunded.

Executive Summary (Continued)

The Alternative funding policy is not consistent with generally accepted actuarial principles because it does not recognize emerging gains or losses.

A funding policy consistent with generally accepted actuarial principles is typically based on the sponsor contributing the normal cost net of employee contributions plus an amortization of the unfunded actuarial accrued liability. The annual amortization amount is generally 6% to 7% of the unfunded actuarial accrued liability. Under state statute, the annual premium tax allocation can only be used to finance the amortization of the unfunded actuarial accrued liability. For fiscal year end 2019, the Alternative funding policy contribution of \$720,671 is sufficient to finance only 70% of the net employer normal cost of \$1,034,647. The state premium tax allocation of \$463,895 is sufficient to finance only 1.6% of the unfunded actuarial accrued liability of \$28,344,997.

This actuarial valuation assumes that the City will be able to make future contributions on a timely basis. The ability of the plan to become funded is heavily dependent on the City contributing the minimum employer contribution calculated under the Alternative funding policy for each and every future year. We did not perform an analysis of the ability of the City to make future contributions. Such an analysis is not within the scope of our assignment or within our analytical skill set. Failure to receive City contributions on a timely basis could jeopardize the sustainability of the Fund.

Please understand that minimum employer contribution calculated under the Alternative funding policy as defined in West Virginia Code 8-22-20 (c)(1) is just that – the minimum that needs to be contributed each and every year. Because this is an underfunded plan, we continue to recommend that the plan sponsor consider making additional contributions (in excess of the minimum requirement) to ensure that there are sufficient assets available in the fund in all years to pay the promised benefits.

If the minimum employer contributions (calculated under the Alternative funding policy) are not made or investment return is less than the assumption of 4.50%, the funded ratio will be lower and the cash flow strain could be higher. If another significant market downturn occurs while the plan's funded ratio is declining, the plan may need to liquidate assets in order to pay benefits which could have a further adverse effect on the funded status of the System.

Under the Alternative funding policy, City contributions increase by seven percent and do not change as a result of emerging actuarial experience. However, emerging experience gains and losses could impact the Plan's funded ratio as follows:

- If the actual return on assets is *less* than the assumed return of 4.50%, then contributions will generally *increase*. Conversely, if the actual return is *greater* than the assumed return, contributions will generally *decrease*.
- If salaries *increase* by more than assumed, contributions could *increase*. If salaries *decrease* by more than assumed, contributions could *decrease*.
- If active members retire *sooner* than expected, contributions will generally *increase*. If active members retire *later* than expected, contributions will generally *decrease*.
- If active members become disabled during the year, contributions could increase.
- If retired members die *later* than expected, contributions will increase. If retired members die *sooner* than expected, contributions will decrease.

Executive Summary (Continued)

- If the general inflation is *greater* than assumed, supplemental benefits will be greater than assumed and contributions will *increase*. Conversely, if general inflation is *lower* than assumed, contributions will *decrease*.

At least once every five years, GRS performs an experience review analysis and updates the actuarial valuation assumptions. For example, if salary increases were consistently lower than assumed during the experience period, then the salary increase rate would likely be lowered. Or if more members retired than assumed, then the retirement rates would likely be increased. Any change in actuarial assumption will also impact the City's funded ratio. The objective of a change in assumptions is to reduce the level of experience gains and losses in future actuarial valuations.

Schedule A: Summary of Key Valuation Results

Valuation Date	July 1, 2016	July 1, 2017
Valuation Interest Rate	4.50%	4.50%
Cost-of-Living Adjustment	2.75%	2.75%
Wage Inflation	3.75%	3.75%
Expected Payroll	\$2,080,112	\$2,183,999
Average Pay	\$53,336	\$53,268
Expected Benefit Payments	\$1,906,216	\$2,041,951
1. Actuarial Accrued Liability	<u>No.</u>	<u>No.</u>
(a) Actives	39	41
(b) Retirees	35	36
(c) Survivors	12	14
(d) Disabled Members	8	8
(e) Deferred Vested Members	0	0
(f) Total	94	99
2. Present Value of Future Normal Costs	\$9,907,497	\$11,499,831
3. Present Value of Benefits (1(f) + 2)	\$54,797,097	\$57,588,957
4. Market Value of Assets	\$16,966,940	\$17,744,129
5. Unfunded Actuarial Accrued Liability (1(f) - 4)	\$27,922,660	\$28,344,997
6. Funded Ratio (4 / 1(f))	37.80%	38.50%
7. Net Employer Normal Cost		
(a) Normal Cost	\$1,138,229	\$1,194,011
(b) Administrative Expenses	\$8,639	\$8,931
(c) Gross Normal Cost (a + b)	\$1,146,868	\$1,202,942
(d) Employee Contribution Rate ^a	7.46%	7.71%
(e) Expected Employee Contributions	\$155,264	\$168,295
(f) Net Employer Normal Cost (c - e)	\$991,604	\$1,034,647
(% of Compensation)	47.67%	47.37%
	FYE 2018	FYE 2019
8. Estimated Minimum Employer Contribution ^b		
(a) Prior Year Alternative Contribution	\$629,462	\$673,524
(b) Increase in Alternative Contribution	7.00%	7.00%
(c) Current Year Alternative Contribution	\$673,524	\$720,671
(d) Additional Contribution	\$0	\$0
(e) Alternative Contribution (c + d)	\$673,524	\$720,671

^a Blended rate reflecting 7.0% for members hired before January 1, 2010, and 9.5% for members hired after January 1, 2010.

^b Estimated Minimum Employer Contribution is based on Alternative funding policy and is assumed to be made in plan year ending June 30, 2019.

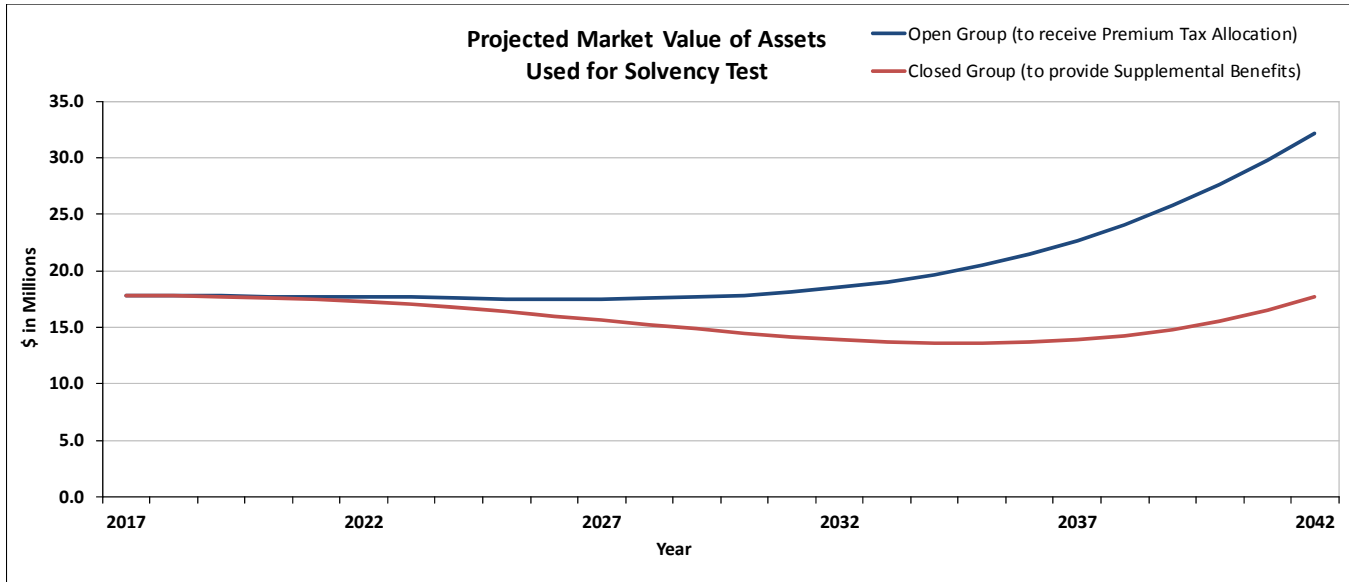
Schedule B: (Gain)/Loss Analysis

Experience (Gain)/Loss for Plan Year Ended June 30, 2017

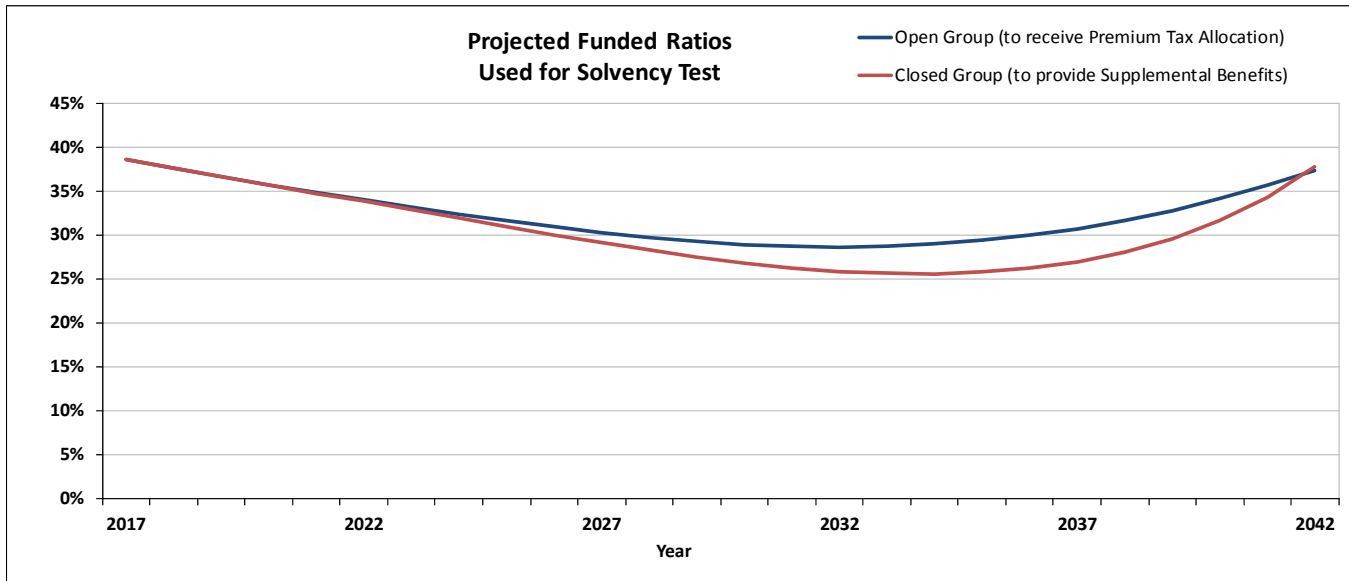
1. (a) Actuarial Accrued Liability as of 7/1/2016	\$44,889,600
(b) Normal Cost due 7/1/2016	\$1,138,229
(c) Interest on (a) and (b) to 6/30/2017	\$2,045,642
(d) Benefit Payments with interest to 6/30/2017	\$1,884,626
(e) Effect of Assumption Changes	\$0
(f) Expected Liability at 7/1/2017 [(a) + (b) + (c) - (d) + (e)]	\$46,188,845
(g) Actual Liability at 7/1/2017	\$46,089,126
(h) Liability (Gain)/Loss [(g) - (f)]	(\$99,719)
2. (a) Market Value of Assets as of 7/1/2016	\$16,966,940
(b) Interest on (a) to 6/30/2017	\$760,096
(c) Contributions with interest to 6/30/2017	\$1,261,079
(d) Benefit Payments with interest to 6/30/2017	\$1,884,626
(e) Expected Assets at 6/30/2017 [(a) + (b) + (c) - (d)]	\$17,103,489
(f) Actual Assets at 7/1/2017	\$17,744,129
(g) Asset (Gain)/Loss [(e) - (f)]	(\$640,640)
3. Total (Gain)/Loss [1(h) + 2(g)]	(\$740,359)

Graphs 1A and 1B: Solvency Projections

Graph 1A



Graph 1B



SECTION II

ACTUARIAL PROJECTIONS

ALTERNATIVE FUNDING POLICY

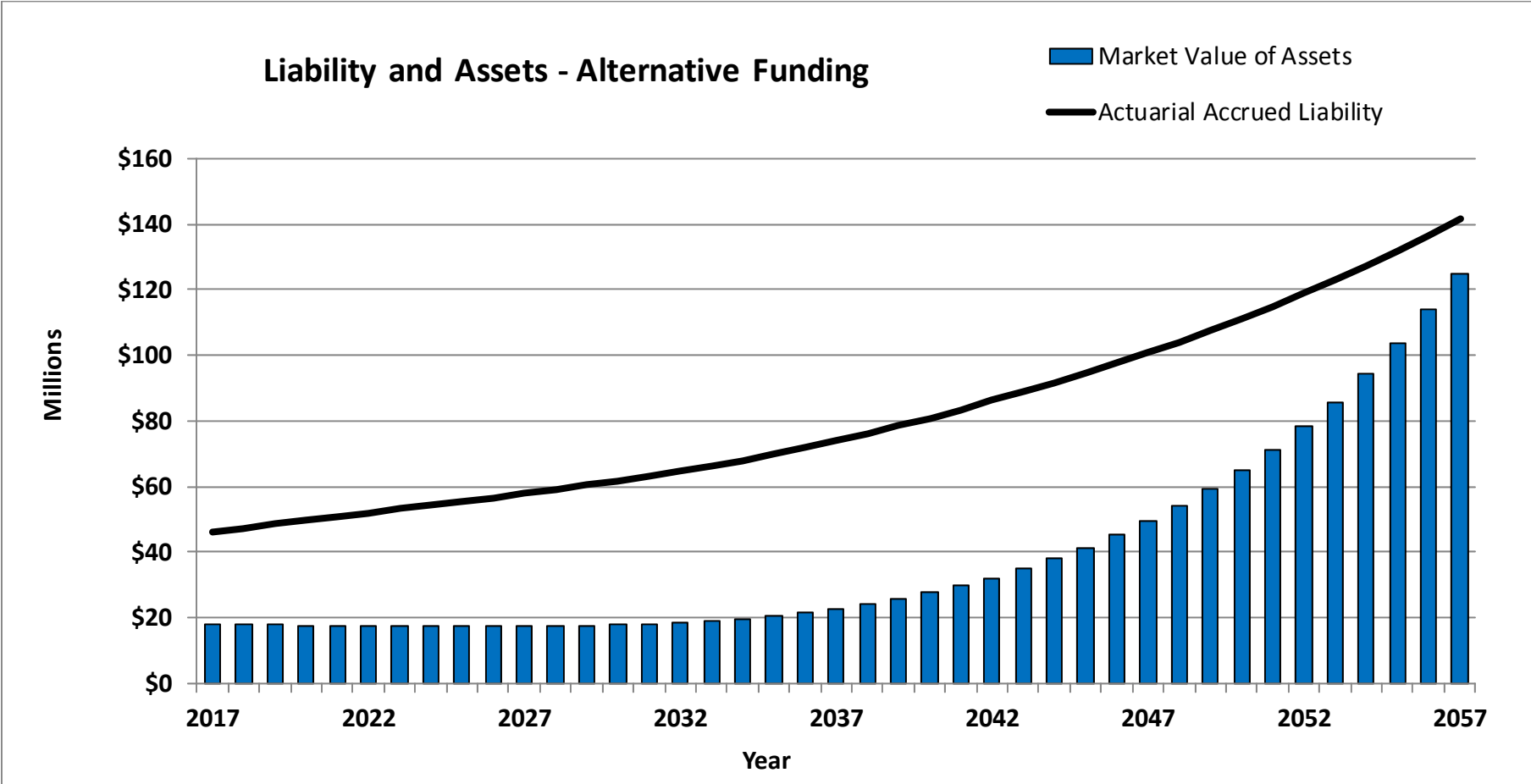
Alternative Funding on a Closed Group Basis, Table 1

Valuation Year End 30-Jun	Plan Number		Total Assets										Actuarial		
	Pay		Total Payroll	Assets (bov)	Benefit Payments	Employer Expenses	Employer Contributions	Employee Contributions	Premium Tax Allocation Contributions	Investment Income	Assets (eov)	Accrued Liability	Unfunded Liability	Funded Ratio	
	Active	Status													
2017	41	58	\$2,080,112	\$16,966,940	\$1,843,155	\$24	\$629,465	\$174,158	\$428,814	\$1,387,931	\$17,744,129	\$46,089,126	\$28,344,997	38%	
2018	37	61	2,183,999	17,744,129	2,041,951	8,931	673,524	168,295	443,192	781,443	17,759,701	47,296,299	29,536,598	38%	
2019	34	62	2,089,831	17,759,701	2,156,194	9,027	720,671	162,245	463,895	780,975	17,722,266	48,381,772	30,659,506	37%	
2020	31	64	2,007,514	17,722,266	2,248,292	9,130	771,118	156,800	434,800	777,593	17,605,155	49,370,497	31,765,342	36%	
2021	29	63	1,948,225	17,605,155	2,318,524	9,244	825,096	152,953	426,025	771,677	17,453,138	50,293,246	32,840,108	35%	
2022	26	65	1,888,636	17,453,138	2,391,475	9,265	882,853	149,106	419,982	764,278	17,268,616	51,147,129	33,878,513	34%	
2023	24	65	1,789,225	17,268,616	2,487,850	9,392	944,653	142,517	414,313	754,929	17,027,787	51,883,649	34,855,862	33%	
2024	21	65	1,675,811	17,027,787	2,595,855	9,419	1,010,779	135,000	406,135	742,810	16,717,237	52,478,292	35,761,055	32%	
2025	20	66	1,584,350	16,717,237	2,686,529	9,442	1,081,534	129,055	397,197	728,061	16,357,114	52,954,840	36,597,726	31%	
2026	18	66	1,526,935	16,357,114	2,749,136	9,570	1,157,241	125,528	395,456	712,027	15,988,660	53,356,040	37,367,380	30%	
2027	16	67	1,456,188	15,988,660	2,822,111	9,702	1,238,248	121,106	394,835	695,510	15,606,546	53,661,349	38,054,803	29%	
2028	15	67	1,391,076	15,606,546	2,888,249	9,834	1,324,925	117,134	393,875	678,659	15,223,055	53,876,276	38,653,221	28%	
2029	13	68	1,319,659	15,223,055	2,952,550	9,964	1,417,670	112,776	395,374	661,969	14,848,331	53,995,687	39,147,356	27%	
2030	12	68	1,238,908	14,848,331	3,019,435	10,093	1,516,907	107,444	394,534	645,686	14,483,374	54,007,141	39,523,767	27%	
2031	11	68	1,175,239	14,483,374	3,066,308	10,218	1,623,090	103,060	395,571	630,505	14,159,074	53,934,901	39,775,827	26%	
2032	10	67	1,116,023	14,159,074	3,105,013	10,337	1,736,706	98,894	396,739	617,509	13,893,572	53,785,531	39,891,959	26%	
2033	9	67	1,051,472	13,893,572	3,141,268	10,449	1,858,275	93,665	399,031	607,393	13,700,219	53,554,321	39,854,102	26%	
2034	8	67	987,169	13,700,219	3,168,439	10,553	1,988,354	88,177	400,056	600,880	13,598,694	53,247,045	39,648,351	26%	
2035	7	66	917,936	13,598,694	3,207,609	10,652	2,127,539	82,898	403,209	598,487	13,592,565	52,848,433	39,255,868	26%	
2036	6	66	828,333	13,592,565	3,252,662	10,740	2,276,467	75,923	406,085	600,429	13,688,067	52,337,770	38,649,703	26%	
2037	5	66	721,335	13,688,067	3,289,482	10,817	2,435,820	66,581	407,909	607,285	13,905,363	51,706,451	37,801,088	27%	
2038	4	65	609,445	13,905,363	3,328,135	10,887	2,606,327	56,537	409,160	619,800	14,258,165	50,944,435	36,686,270	28%	
2039	3	64	512,130	14,258,165	3,351,860	10,942	2,788,770	47,725	411,182	639,055	14,782,096	50,069,563	35,287,467	30%	
2040	2	63	417,003	14,782,096	3,369,821	10,982	2,983,984	38,996	413,330	666,429	15,504,032	49,084,415	33,580,383	32%	
2041	2	62	346,673	15,504,032	3,366,511	11,005	3,192,863	32,511	415,087	703,533	16,470,511	48,019,661	31,549,150	34%	
2042	1	61	263,657	16,470,511	3,377,359	11,011	3,416,363	24,777	417,767	751,644	17,692,693	46,854,999	29,162,306	38%	
2043	1	59	173,534	17,692,693	3,388,222	10,999	3,655,508	16,303	419,036	811,561	19,195,881	45,583,876	26,387,995	42%	
2044	0	58	121,655	19,195,881	3,360,098	10,970	3,911,394	11,434	420,325	885,446	21,053,412	44,258,839	23,205,427	48%	
2045	0	56	83,329	21,053,412	3,319,209	10,924	4,185,192	7,867	421,044	975,975	23,313,356	42,897,244	19,583,888	54%	
2046	0	54	56,800	23,313,356	3,267,347	10,862	4,478,155	5,396	421,478	1,085,302	26,025,477	41,514,515	15,489,038	63%	
2047	0	52	38,575	26,025,477	3,207,458	10,786	4,791,626	3,665	421,430	1,215,617	29,239,571	40,121,935	10,882,364	73%	
2048	0	51	25,706	29,239,571	3,142,263	10,696	5,127,040	2,442	420,992	1,369,131	33,006,216	38,727,181	5,720,965	85%	
2049	0	49	16,029	33,006,216	3,073,754	10,596	5,444,532	1,523	419,998	1,547,179	37,335,099	37,335,099	0	100%	
2050	0	47	9,601	37,335,099	3,002,358	10,485	13,790	912	0	1,613,364	35,950,321	35,950,321	0	100%	
2051	0	45	5,903	35,950,321	2,928,816	10,367	12,374	561	0	1,552,648	34,576,721	34,576,721	0	100%	
2052	0	43	2,390	34,576,721	2,855,288	10,242	11,055	227	0	1,492,439	33,214,911	33,214,911	0	100%	
2053	0	42	0	33,214,911	2,781,316	10,113	10,113	0	0	1,432,780	31,866,375	31,866,375	0	100%	
2054	0	40	0	31,866,375	2,706,236	9,980	9,979	0	0	1,373,767	30,533,905	30,533,905	0	100%	
2055	0	38	0	30,533,905	2,631,856	9,844	9,844	0	0	1,315,461	29,217,510	29,217,510	0	100%	
2056	0	37	0	29,217,510	2,558,196	9,707	9,707	0	0	1,257,862	27,917,176	27,917,176	0	100%	
2057	0	35	0	27,917,176	2,485,176	9,568	9,570	0	0	1,200,972	26,632,973	26,632,973	0	100%	

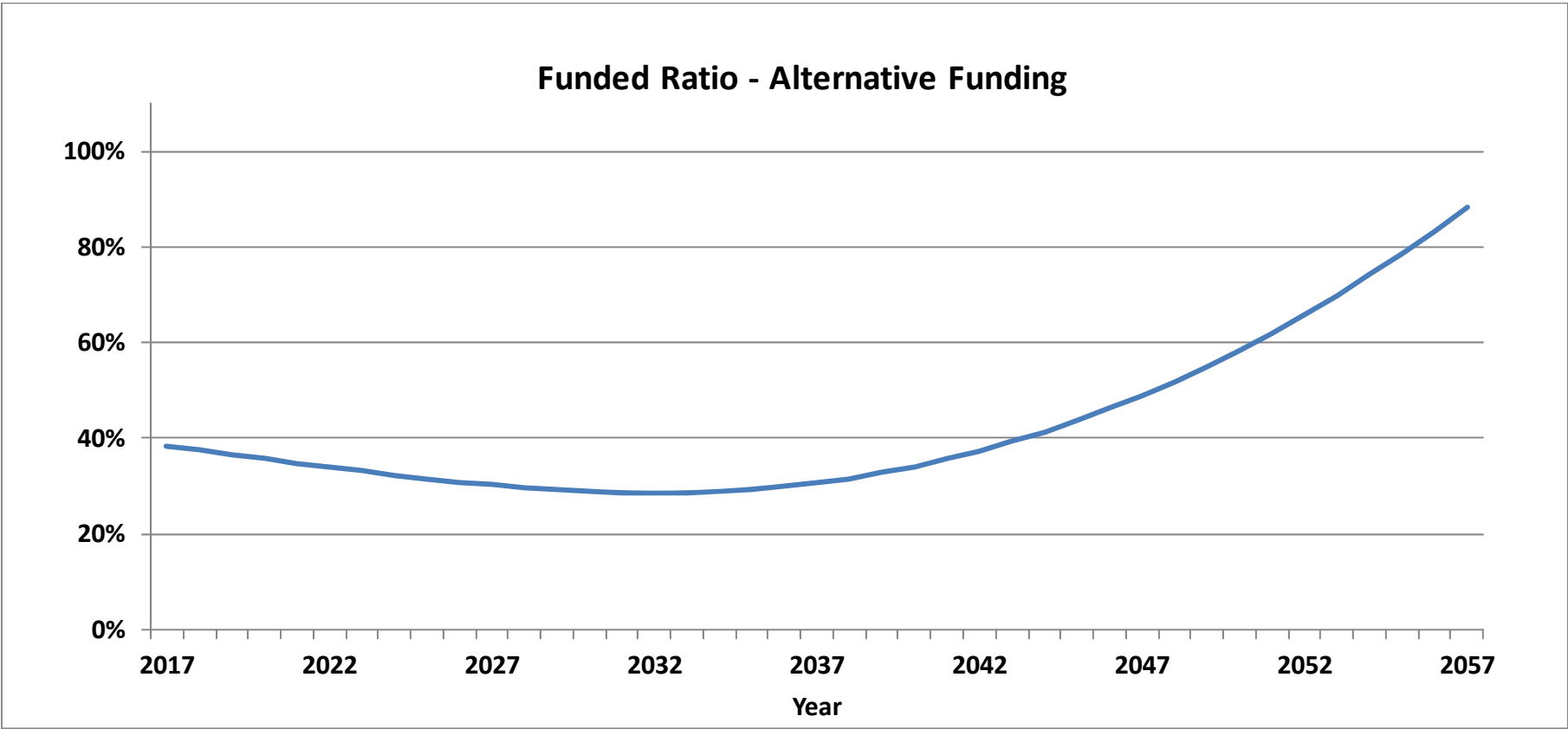
Alternative Funding on an Open Group Basis, Table 2

Valuation Plan Year End 30-Jun	Number		Total Assets										Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status	Total Payroll	Assets		Benefit		Employer	Employee	Premium Tax	Investment	Assets			
				(bov)	Payments	Expenses	Contributions	Contributions	Allocation	Income	(eoy)				
2017	41	58	\$2,080,112	\$16,966,940	\$1,843,155	\$24	\$629,465	\$174,158	\$428,814	\$1,387,931	\$17,744,129	\$46,089,126	\$28,344,997	38%	
2018	41	61	2,183,999	17,744,129	2,041,951	8,931	673,524	168,295	443,192	781,443	17,759,701	47,296,300	29,536,599	38%	
2019	41	62	2,250,550	17,759,701	2,156,194	9,418	720,671	178,903	463,895	781,337	17,738,895	48,467,391	30,728,496	37%	
2020	41	64	2,311,083	17,738,895	2,248,818	9,815	771,118	187,161	490,176	780,222	17,708,940	49,620,908	31,911,968	36%	
2021	41	63	2,412,606	17,708,940	2,320,495	10,249	825,096	198,872	506,465	779,093	17,687,722	50,800,273	33,112,551	35%	
2022	41	65	2,479,555	17,687,722	2,395,585	10,491	882,853	206,945	516,976	778,161	17,666,580	51,987,991	34,321,411	34%	
2023	41	65	2,541,396	17,666,580	2,494,636	10,916	944,653	216,142	533,126	776,936	17,631,885	53,157,292	35,525,407	33%	
2024	41	65	2,600,561	17,631,885	2,605,719	11,249	1,010,779	225,420	546,938	774,880	17,572,934	54,293,641	36,720,707	32%	
2025	41	66	2,703,439	17,572,934	2,700,173	11,610	1,081,534	238,457	561,719	772,311	17,515,172	55,436,728	37,921,556	32%	
2026	41	67	2,813,407	17,515,172	2,767,308	11,994	1,157,241	250,998	577,322	770,520	17,491,951	56,619,964	39,128,013	31%	
2027	41	67	2,914,009	17,491,951	2,845,472	12,383	1,238,248	263,218	593,522	770,162	17,499,246	57,829,734	40,330,488	30%	
2028	41	67	3,040,619	17,499,246	2,917,281	12,807	1,324,925	278,006	611,372	771,538	17,554,999	59,087,456	41,532,457	30%	
2029	41	68	3,142,933	17,554,999	2,987,875	13,172	1,417,670	290,445	627,682	775,171	17,664,920	60,384,054	42,719,134	29%	
2030	41	68	3,275,768	17,664,920	3,061,649	13,618	1,516,907	306,184	646,364	781,441	17,840,549	61,733,767	43,893,218	29%	
2031	41	68	3,413,315	17,840,549	3,116,218	14,010	1,623,090	321,370	663,682	791,207	18,109,670	63,160,819	45,051,149	29%	
2032	41	68	3,565,638	18,109,670	3,163,379	14,408	1,736,706	337,934	681,518	805,553	18,493,595	64,683,980	46,190,385	29%	
2033	41	68	3,712,811	18,493,595	3,208,757	14,785	1,858,275	353,420	699,493	825,261	19,006,501	66,305,859	47,299,358	29%	
2034	41	68	3,885,724	19,006,501	3,245,713	15,196	1,988,354	371,304	718,668	851,229	19,675,148	68,052,914	48,377,766	29%	
2035	41	68	4,047,074	19,675,148	3,295,848	15,568	2,127,539	388,590	737,884	884,104	20,501,848	69,914,400	49,412,552	29%	
2036	41	67	4,212,492	20,501,848	3,352,916	15,967	2,276,467	406,791	758,176	924,198	21,498,597	71,891,269	50,392,672	30%	
2037	41	67	4,373,649	21,498,597	3,402,573	16,362	2,435,820	421,671	778,463	972,266	22,687,881	73,991,323	51,303,442	31%	
2038	41	67	4,536,353	22,687,881	3,455,047	16,790	2,606,327	435,031	800,972	1,029,199	24,087,572	76,207,371	52,119,799	32%	
2039	41	67	4,697,485	24,087,572	3,503,131	17,231	2,788,770	448,608	824,075	1,095,982	25,724,644	78,534,451	52,809,807	33%	
2040	41	67	4,854,539	25,724,644	3,568,672	17,692	2,983,984	462,133	848,253	1,173,364	27,606,014	80,961,156	53,355,142	34%	
2041	41	67	5,041,565	27,606,014	3,632,143	18,183	3,192,863	478,545	873,726	1,262,182	29,763,005	83,511,036	53,748,031	36%	
2042	41	67	5,188,403	29,763,005	3,728,125	18,634	3,416,363	490,526	898,008	1,362,882	32,184,024	86,140,673	53,956,649	37%	
2043	41	67	5,363,148	32,184,024	3,840,942	19,182	3,655,508	505,667	925,747	1,475,580	34,886,402	88,850,350	53,963,948	39%	
2044	41	67	5,547,003	34,886,402	3,933,998	19,686	3,911,394	521,796	952,205	1,601,747	37,919,859	91,666,152	53,746,293	41%	
2045	41	66	5,743,895	37,919,859	4,032,976	20,203	4,185,192	539,740	978,834	1,743,123	41,313,569	94,596,530	53,282,961	44%	
2046	41	66	5,948,389	41,313,569	4,136,614	20,713	4,478,155	558,161	1,005,428	1,901,043	45,099,029	97,649,004	52,549,975	46%	
2047	41	66	6,161,434	45,099,029	4,245,021	21,231	4,791,626	577,921	1,032,465	2,076,982	49,311,770	100,828,487	51,516,717	49%	
2048	41	66	6,384,966	49,311,770	4,361,423	21,759	5,127,040	598,868	1,060,116	2,272,499	53,987,111	104,141,839	50,154,728	52%	
2049	41	65	6,617,092	53,987,111	4,484,696	22,293	5,485,933	620,679	1,088,124	2,489,229	59,164,087	107,595,913	48,431,826	55%	
2050	41	65	6,860,905	59,164,087	4,612,451	22,841	5,869,948	643,949	1,116,945	2,729,042	64,888,679	111,198,602	46,309,923	58%	
2051	41	65	7,117,520	64,888,679	4,745,632	23,401	6,280,844	668,594	1,146,405	2,994,020	71,209,508	114,960,377	43,750,869	62%	
2052	41	64	7,385,392	71,209,508	4,884,239	23,974	6,720,503	694,267	1,176,610	3,286,388	78,179,063	118,889,919	40,710,856	66%	
2053	41	64	7,666,536	78,179,063	5,027,191	24,564	7,190,938	721,404	1,207,770	3,608,588	85,856,008	122,997,933	37,141,925	70%	
2054	41	64	7,963,160	85,856,008	5,173,518	25,172	7,694,304	750,077	1,239,843	3,963,334	94,304,877	127,297,730	32,992,853	74%	
2055	41	64	8,272,394	94,304,877	5,324,556	25,796	8,232,905	779,790	1,272,993	4,353,543	103,593,755	131,800,659	28,206,904	79%	
2056	41	63	8,596,008	103,593,755	5,479,748	26,444	8,809,208	810,683	1,307,464	4,782,353	113,797,271	136,517,973	22,720,702	83%	
2057	41	63	8,931,382	113,797,271	5,640,389	27,115	9,425,853	842,403	1,343,241	5,253,145	124,994,408	141,458,751	16,464,343	88%	

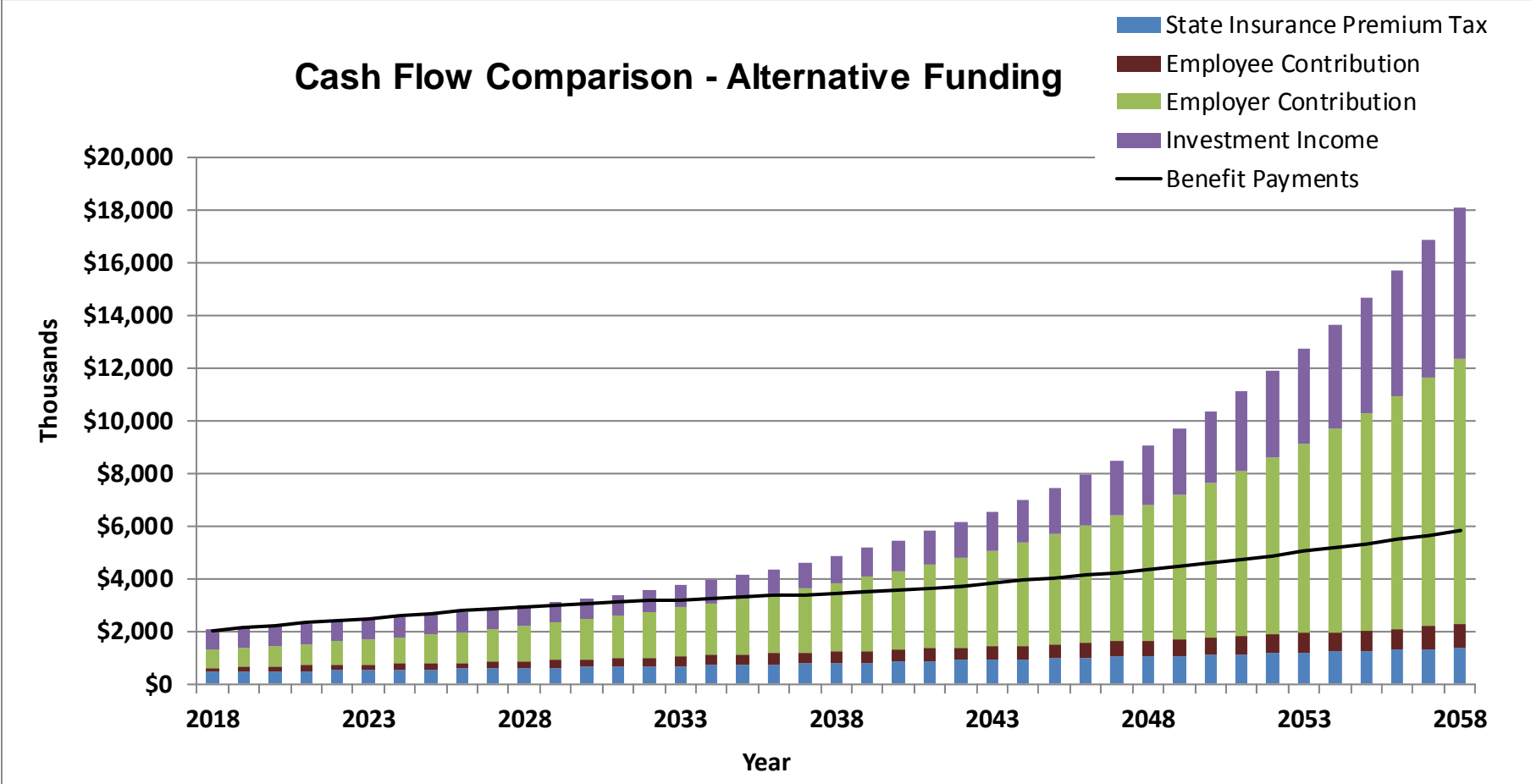
Open Group Actuarial Projections – Alternative Funding, Graph 2



Open Group Actuarial Projections – Alternative Funding, Graph 3



Open Group Actuarial Projections – Alternative Funding, Graph 4



SECTION III

FUNDING POLICY CHOICES

Actuarial Projections –Alternative/Optional/Conservation Funding

Funding Policy Choices

West Virginia Code §8-22-20 allows a municipality's governing body (City Council) the choice of changing from the Alternative funding policy to either the Optional funding policy or the Conservation funding policy. The Optional funding policy is defined in West Virginia Code §8-22-20(e)(1), and is effective for plan years beginning after January 1, 2010. The Conservation funding policy is defined in West Virginia Code §8-22-20(f)(1), and is effective for plan years beginning after April 1, 2011.

If the City Council elects either the Optional funding policy or the Conservation funding policy, the existing local Plan is closed, and new employees are covered in the multiple employer statewide plan - *Municipal Police Officers and Firefighters Retirement System*. Contributions to the statewide plan include:

- Employer contributions from 8.5% to 10.5% of pay. Currently, Employers contribute 8.5% of pay.
- Employee contributions of 8.5% of pay.

If the City Council elects the Optional funding policy, contributions to the closed local Plan include:

- Employer contributions equal to the normal cost, net of employee contributions, plus a 40-year closed period amortization from January 1, 2010, on a level dollar basis, of the unfunded actuarial accrued liability net of premium tax allocation applicable to the plan year.
- Employee contributions of 7% of pay if hired before January 1, 2010, which may be increased by up to 2.5% of pay if elected by the Board of trustees of the Plan. Employees hired after January 1, 2010, contribute 9.50% of pay.
- The premium tax allocation assigned to the Fund for the plan year.

If the City Council elects the Conservation funding policy, contributions to the closed local Plan are made to two asset accounts as follows:

- The first asset account (Benefit Payment Account) is used to finance benefits and expenses for the fiscal year on a pay-as-you-go basis. Sources to pay current year benefits and expenses include active member employee contributions of 5.5% (which is the current contribution rate of 7.0% of pay, less 1.5% which by law goes into the accumulation account), a portion of the premium tax allocation not assigned to the accumulation account as defined below, and employer contributions.
- The second account (Accumulation Account) cannot be used to pay benefits and expenses until assets exceed actuarial accrued liabilities. Contributions to the accumulation account include employee contributions of 1.5% of pay and a percentage of the premium tax allocation. The percentage of premium tax allocation is based on the amounts needed to produce 100% funding of liabilities in 35 years, from adoption, considering assets from both the benefit payment account and the accumulation account. This account also includes the Fund's assets prior to the adoption of Conservation funding policy.

Actuarial Projections –Alternative/Optional/Conservation Funding (Continued)

For purposes of evaluating the implication of selecting either the Optional funding policy or the Conservation funding policy, we have generated actuarial projections under the following two illustrative scenarios.

- Scenario I – The sponsor elects either the Optional funding policy or Conservation funding policy during fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.
- Scenario II – The sponsor elects either the Optional funding policy or the Conservation funding policy at some future date when/if contributions are projected to be less than under the current Alternative funding policy.

It is important to note that the plan sponsor can make only one election to either the Optional funding policy or the Conservation funding policy, and that the election is irrevocable. The projections assume employer contributions of 10.5% of pay for future members covered under the statewide plan.

Scenario I – Sponsor Immediately Elects either the Optional or Conservation Funding Policy

The following table shows the employer contribution for the fiscal year end June 30, 2019, if the sponsor elects either the Optional or Conservation funding policy in fiscal year end June 30, 2019:

Total Employer Contributions for FYE June 30, 2019				
	Local Plan		Statewide Plan	
Funding Method	Amount	Percent of Pay	Amount	Percent of Pay
Alternative	\$720,671	32.0%	NA	NA
Optional	\$2,210,766	105.8%	\$16,875	10.5%
Conservation	\$1,570,428	75.1%	\$16,875	10.5%

Graphs I(1), I(2), and I(3) on the following pages show the projected contribution and funded ratio pattern of the three separate funding policies. If the sponsor continues to make contributions under the Alternative policy, employer contributions are projected to increase from \$673,524 in fiscal year end 2018 to \$9,425,853 in fiscal year end 2057. In fiscal year end 2057, the plan is projected to be 88% funded.

If the Optional funding policy is selected in fiscal year end 2019, employer contributions to the local plan for fiscal year end 2019 are projected to increase from \$720,671 to \$2,210,766. However, over the 40-year projection period, total employer contributions to both the local plan and the statewide plan are projected to decrease from \$2,227,641 in fiscal year end 2019 to \$1,246,540 in fiscal year end 2049, and the Plan is projected to be fully funded in 2050.

Actuarial Projections –Alternative/Optional/Conservation Funding (Continued)

If the Conservation funding policy is selected in fiscal year end 2019, employer contributions to the local plan for fiscal year end 2019 are projected to increase from \$720,671 to \$1,570,428. During the 35-year projection period, total employer contributions to both the local plan and the statewide plan are projected to increase from \$1,587,303 in fiscal year end 2019 to \$2,965,750 in fiscal year end 2040 and the Plan is projected to be fully funded in 2041.

The Optional funding policy is consistent with actuarial standards of practice and produces a relatively stable dollar contribution pattern and reasonable growth in the funded ratio.

The Conservation funding policy produces a less stable contribution pattern an initially slower growth in the funded ratio when compared to the Optional funding policy. The projections of employer contributions under the Conservation funding policy are dependent on the expected number of retirements, disabilities, and resulting benefit payments. Actual experience could produce a significantly higher number of retirements, disabilities, and benefit payments, which would increase the employer's required contribution under the Conservation funding policy. Unlike the Optional funding policy, the Conservation funding policy does not have a built-in feature to smooth out emerging gains and losses.

The Alternative funding policy produces a lower funded ratio when compared to either the Optional funding policy or the Conservation funding policy and the 7% annual increases in employer contributions may eventually be cost prohibitive.

The details of the Optional and Conservation funding policy projections can be found in the Appendix. The details of the Alternative funding policy projection were presented in Section II.

Scenario II – Sponsor Elects Optional or Conservation Policy if/when Contributions are Lower

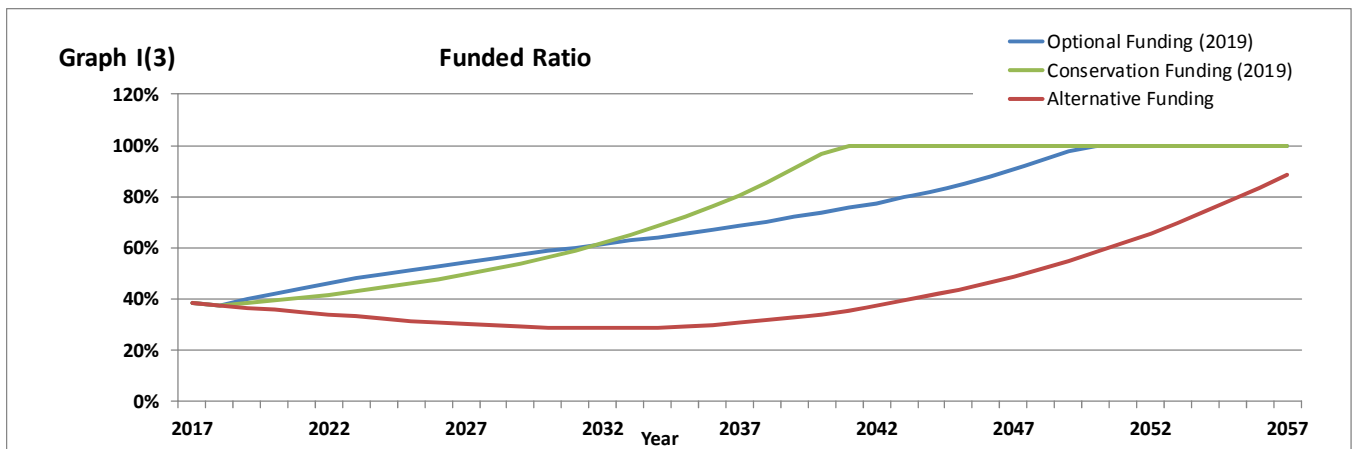
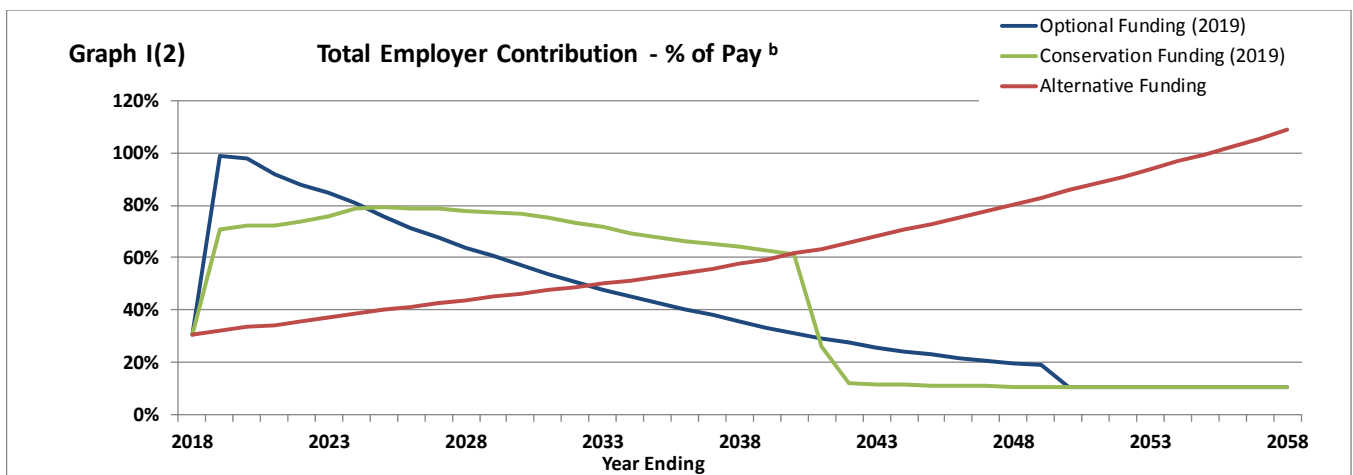
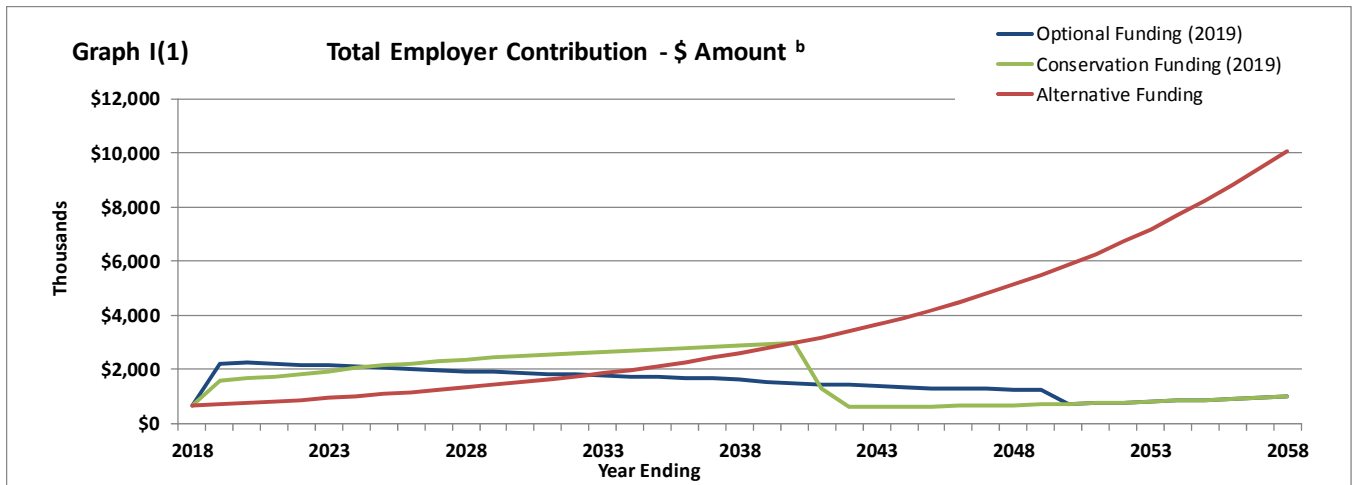
Under Scenario II, the plan sponsor is assumed to make contributions under the Alternative funding policy in future years, until the first year that either the Optional or Conservation policy produces a lower contribution. Under this assumption, the employer contributions under the Optional funding policy are not projected to be lower than contributions under the Alternative funding policy. In plan year end 2037, the employer contributions under the Conservation funding policy of \$2,299,084 are projected to be lower than contributions under the Alternative funding policy of \$2,435,820.

Graphs II(1), II(2), and III(3) show the projected contribution pattern and funded ratio. Based on these projections, the Conservation funding policy has lower projected employer contributions than the Alternative funding policy beginning in 2037. After 2037, the funded ratio under the Conservation funding policy increases at a lower rate than the Alternative funding policy. As stated above, however, the Conservation funding policy is dependent on expected benefits payments when considering the *expected number of retirement and disabilities*. The ultimate employer contributions depend on the *actual number of retirement and disabilities*, which could result in a more volatile contribution pattern when compared to the Optional funding policy.

The details of the Scenario II projections can be found in the Appendix.

Actuarial Projections –Alternative/Optional/Conservation Funding^a (Continued)

Scenario I

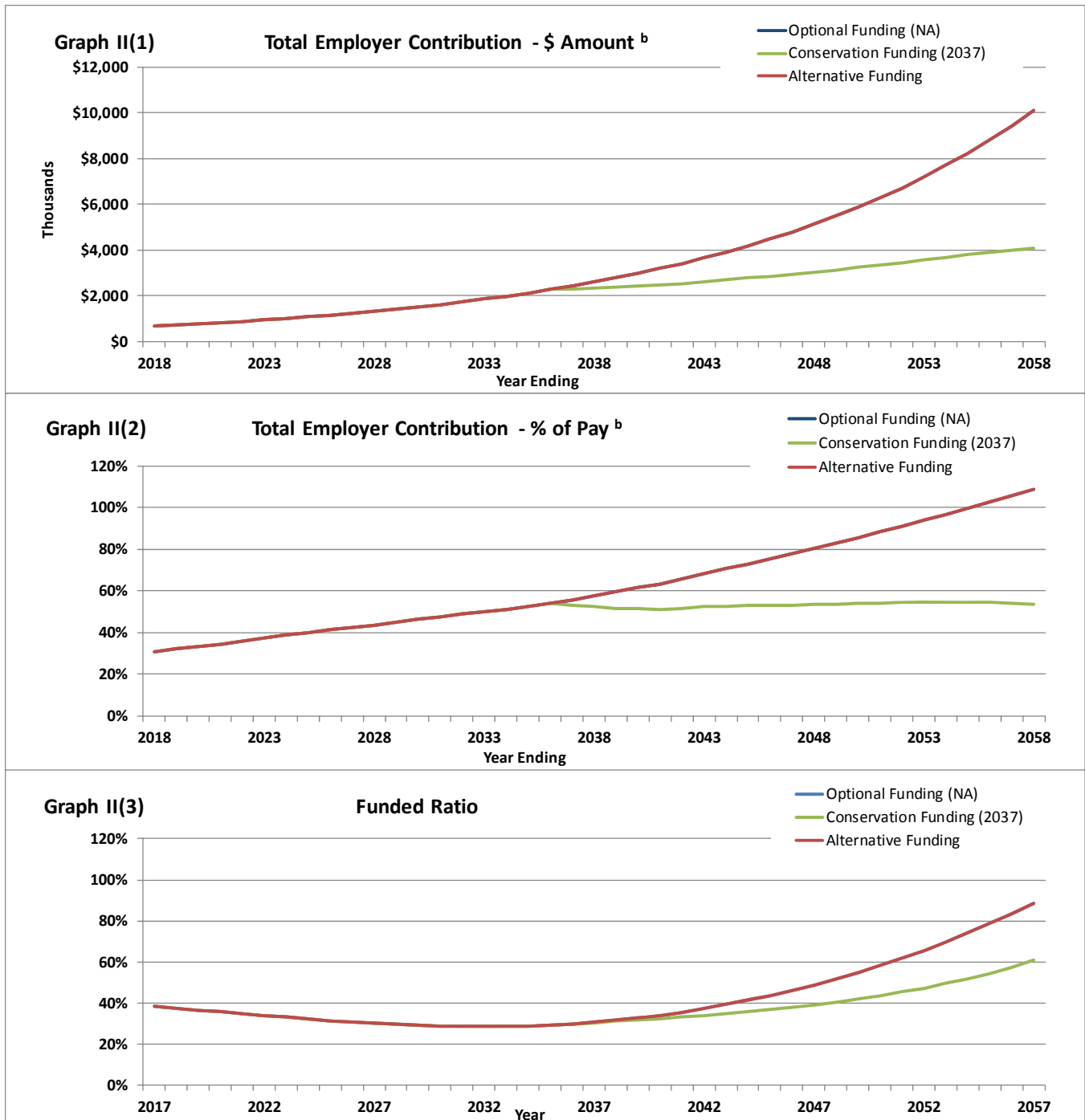


^a Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.

^b Based on total pay and includes contributions for future members projected to participate in the statewide plan.

Actuarial Projections –Alternative/Optional/Conservation Funding^a (Continued)

Scenario II



^a Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in the first year that contributions are lower than under the Alternative funding policy.

^b Based on total pay and includes contributions for future members projected to participate in the statewide plan.

SECTION IV

ACTUARIALLY DETERMINED CONTRIBUTION FOR GASB STATEMENT NOS. 67 AND 68 REPORTING

Actuarially Determined Contribution for GASB Statement Nos. 67 and 68 Reporting

Schedule C: Funding Progress and Employer Contributions

	July 1, 2016	July 1, 2017
Valuation Date		
Valuation Interest Rate	4.50%	4.50%
Cost-of-Living Adjustment	2.75%	2.75%
Wage Inflation	3.75%	3.75%
Actuarial Value of Assets	Market	Market
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Remaining Amortization Period ^a	24 Years, Level % of Pay	23 Years, Level % of Pay
Schedule of Funding Progress		
	July 1, 2016	July 1, 2017
Actuarial Valuation Date		
1. Market Value of Assets	\$16,966,940	\$17,744,129
2. Actuarial Accrued Liability	\$44,889,600	\$46,089,126
3. Unfunded Actuarial Accrued Liability (2 - 1)	\$27,922,660	\$28,344,997
4. Funded Ratio (1/2)	38%	38%
5. Expected Payroll	\$2,080,112	\$2,183,999
6. UAAL as Percentage of Covered Payroll (3/5)	1,342%	1,298%
Schedule of Employer Contributions ^c		
	FYE 2017	FYE 2018
1. Actuarially Determined Contribution		
(a) Employer Normal Cost	\$991,604	\$1,034,647
(b) Amortization of Unfunded Actuarial Accrued Liability	\$1,262,351	\$1,332,487
(c) Actuarially Determined Contribution (ADC) (a + b)	\$2,253,955	\$2,367,134
2. Employer Contribution ^b	\$629,465	\$673,524
3. Premium Tax Allocation	\$428,814	\$443,192
4. Percentage of ADC Contributed [(2 + 3)/1(c)]	47%	47%

^a Suggested amortization policy to comply with GASB Statement Nos. 67 and 68 Standards.

^b Estimated employer contribution for fiscal year end June 30, 2018.

^c The Alternative minimum contribution plus the premium tax allocation does not satisfy the Actuarially Determined Contribution as defined by GASB Statement Nos. 67 and 68.

SECTION V

**ACTUARIAL VALUATION DATA AS OF
JULY 1, 2017**

Actuarial Valuation Data as of July 1, 2017

Schedule D: Reconciliation of Assets

Plan Year Ending	June 30, 2016	June 30, 2017
A. Market Value of Assets Beginning of Year	\$16,814,980	\$16,966,940
Adjustment to Market Value of Assets at Beginning of Year	\$0	\$0
Market Value of Assets Beginning of Year	\$16,814,980	\$16,966,940
1. Revenue During Fiscal Year		
(a) Employee Contribution	\$167,650	\$174,158
(b) Governmental Contribution		
(i) From Local Government	\$588,285	\$629,465
(ii) From State Government	\$376,670	\$428,814
(iii) Reallocation from State Government	\$0	\$0
(iv) Total	\$964,955	\$1,058,279
(c) Earnings on Investments		
(i) Net Appreciation/(Depreciation)	(\$14,806)	\$183,038
(ii) Bond Interest	\$97,143	\$96,197
(iii) Dividends	\$418,485	\$474,944
(iv) Net Realized Gain (Loss) on Sale/Exchange	\$304,114	\$657,863
(v) Other	\$0	\$0
(vi) Less Investment Expense	(\$57,301)	(\$59,519)
(vii) Total	\$747,635	\$1,352,523
(d) Other Revenue	\$0	\$0
(e) Net Receivable Investment Income	\$41,654	\$35,408
(f) Receivable Contribution ^a		
(i) From Employee Contributions	\$0	\$0
(ii) From Local Government	\$0	\$0
(iii) From State Government	\$34,273	\$0
(iv) Total	\$34,273	\$0
(g) Total Revenue (sum of (a) through (f))	\$1,956,167	\$2,620,368
2. Expenditures During Fiscal Year		
(a) Benefits Paid	\$1,787,888	\$1,843,155
(b) Withdrawals	\$16,024	\$0
(c) Administrative Expenses	\$295	\$24
(d) Payable Benefits and Withdrawals	\$0	\$0
(e) Payable Administrative Expenses	\$0	\$0
(f) Total Expenditures (sum of (a) through (e))	\$1,804,207	\$1,843,179
B. Market Value of Assets End of Year		
[A + 1(g) - 2(f)]	\$16,966,940	\$17,744,129
C. Approximate Return on Assets	4.81%	8.36%

^a Receivable contributions for each respective plan year ending.

Actuarial Valuation Data as of July 1, 2017

Schedule E: Assets Held by Category

Plan Year Ending	June 30, 2016		June 30, 2017	
1. Cash and Short-term Investments	\$272,301	2%	\$974,481	5%
2. Government Securities				
(a) US Treasury Bills, Notes and Bonds	\$1,185,300		\$1,154,472	
(b) US State and Local Governmental Debt Securities	\$25,672		\$25,334	
(c) Foreign Governmental Debt Securities	\$0		\$0	
(d) Other	\$0		\$0	
(e) Total Government Securities (sum of (a) through (d))	\$1,210,972	7%	\$1,179,806	7%
3. Corporate Fixed Income				
(a) US Bonds	\$4,739,186		\$4,032,435	
(b) US Mortgage or other Asset Backed Securities	\$0		\$0	
(c) US Mutual Fund Shares (Bonds)	\$668,848		\$671,573	
(d) US Exchange Traded Funds (Bonds)	\$0		\$0	
(e) International Bonds	\$0		\$0	
(f) International Mutual Fund Shares (Bonds)	\$0		\$0	
(g) International Exchange Traded Funds (Bonds)	\$0		\$0	
(h) Total Corporate Fixed Income (sum of (a) through (g))	\$5,408,034	32%	\$4,704,008	27%
4. Corporate Equity				
(a) US Equity	\$5,684,211		\$6,161,540	
(b) US Mutual Fund Shares (Equity)	\$3,456,867		\$3,812,960	
(c) US Exchange Traded Funds (Equity)	\$0		\$0	
(d) International Equity	\$18,776		\$0	
(e) International Mutual Fund Shares (Equity)	\$249,953		\$329,150	
(f) International Exchange Traded Funds (Equity)	\$0		\$0	
(g) Total Corporate Equity (sum of (a) through (f))	\$9,409,807	56%	\$10,303,650	58%
5. Alternative Investments				
(a) Real Estate Investment Trust	\$0		\$0	
(b) Private Equity Fund	\$0		\$0	
(c) Hedge Funds	\$0		\$0	
(d) Other Alternative Investments	\$589,899		\$546,776	
(e) Total Alternative Investments (sum of (a) through (d))	\$589,899	3%	\$546,776	3%
6. Other	\$0	0%	\$0	0%
7. Receivable Contributions	\$0			
(a) From Employee Contributions	\$0		\$0	
(b) From Local Government	\$0		\$0	
(c) From State Government	\$34,273		\$0	
(d) Total Receivable Contributions (sum of (a) through (c))	\$34,273	0%	\$0	0%
8. Accruals				
(a) Receivable (other than State and Local Contributions)	\$41,654		\$35,408	
(b) Less Payable	\$0		\$0	
(c) Total	\$41,654	0%	\$35,408	0%
Market Value of Assets End of Year	\$16,966,940		\$17,744,129	
[sum of (1) through (8)]				

Actuarial Valuation Data as of July 1, 2017

Schedule F: Summary of Participant Activity

	Actives	Retirees	Disabled	Deferred Vested	Spouses and Beneficiaries	Totals
Total Participants July 1, 2016:	39	35	8	0	12	94
New Actives:	5					5
Returned to Actives Status:						0
Data Corrections/Other Changes:		(1)			1	0
Vested Terminations:						0
Non-Vested Terminations:						0
Disabled:						0
Retirements:	(3)	3				0
Deaths with Beneficiary:		(1)			1	0
Deaths w/o Beneficiary:						0
Expired Annuity or Stop Payment:						0
Net Changes:	2	1	0	0	2	5
Total Participants June 30, 2017:	41	36	8	0	14	99

Actuarial Valuation Data as of July 1, 2017

Schedule G: Distribution of Active Employees by Age and Length of Service

Attained Age	Years of Service to Valuation Date									Totals	Valuation Payroll ^a
	Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 35		
Under 20											\$ 0
20-24											\$ 0
25-29	4	1	1							6	\$ 251,124
30-34	1	3	2	1						7	\$ 319,482
35-39		1	1	3						5	\$ 251,600
40-44			2	2	3	2				9	\$ 484,929
45-49				1	5	1				7	\$ 457,221
50-54						2	2			4	\$ 289,578
55-59						1			1	2	\$ 124,496
60-64						1				1	\$ 61,545
65-69											\$ 0
Over 70											\$ 0
Totals	5	5	6	7	8	7	2	0	1	41	\$ 2,239,975
Averages _____											
Age: 41.0 years											
Service: 12.3 years											
Annual Pay: \$54,634 ^a											

^aBased on payroll at beginning of plan year.

Actuarial Valuation Data as of July 1, 2017

Schedule H: Participants Summary

Active Participants	July 1, 2016	July 1, 2017
Number of Actives	39	41
Total Annual Pay	\$2,185,145	\$2,239,975
Average Age	42.7	41.0
Average Service	13.8	12.3

Inactive Participants	July 1, 2016		July 1, 2017	
Type	No.	Annual Benefit	No.	Annual Benefit
Retirees	35	\$1,479,935	36	\$1,595,569
Survivors	12	\$154,667	14	\$199,670
Disabled Members	8	\$171,124	8	\$172,807
Deferred Vested Members	0	\$0	0	\$0

SECTION VI

ACTUARIAL ASSUMPTIONS AND METHODS

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017

Discount Rate

The following table outlines the factors used to determine the discount rate:

Funded Ratio as of Valuation Date ¹	Liquidity Ratio ²	Equity Exposure ³	Projected Funded Ratio after 15 Years ¹	Discount Rate
60% or more	10	50% or more	70% or more	6.5%
40% or more	8	40% or more	60% or more	6.0%
30% or more	6	30% or more	50% or more	5.5%
15% or more	4	n/a	40% or more	5.0%
Less than 15%	n/a	n/a	15% or more	4.5%
Less than 15%	n/a	n/a	Less than 15%	4.0%

¹Funded ratios based on a 6.0% investment return assumption for plans using an actuarially sound policy (standard or optional) and a 5.5% investment return assumption for other plans (alternative or conservation).

²Liquidity ratio equals assets as of the actuarial valuation date divided by expected benefit payments for the year.

³Based on investment policy.

As of June 30, 2017	
Assets	\$17,744,129
Liabilities using a 5.50% discount rate	\$40,515,523
Funded Ratio	44%
Expected Benefit Payments	\$2,041,951
Liquidity Ratio	8.69
Equity Exposure	58%
Projected Funded Ratio after 15 years	39%

Discount Rate

4.50%

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

The premium tax allocation is projected using the following methodology:

- (1) The Base Allocation for all Pension and Relief Funds is a fixed amount equal to \$8,709,689 in all future years. This amount is allocated to each individual Pension and Relief Fund in proportion to the number of eligible members, which includes active members covered in either the Pension and Relief Fund or the statewide plan, Municipal Police Officers and Firefighters Retirement System (“MPFRS”).
- (2) The Excess Allocation is equal to the excess of the current year premium tax assigned to all Pension and Relief Funds over the total Base Allocation. This amount is allocated to each individual Pension and Relief Fund in proportion to the number of eligible active and retired members covered in either the Pension and Relief Fund or the MPFRS.
- (3) We have assumed all Pension and Relief Funds will make the minimum statutory contribution requirement and will receive 100% of both the Base Allocation and the Excess Allocation assigned to the individual plan. Consequently, the projections do not include any reallocation of Expired Premium Tax Allocation for plan years beginning on and after July 1, 2019.
- (4) The total available premium tax allocation, net of expenses, as of September 1, 2018, includes a Base Allocation of \$8,709,689, an Excess Allocation of \$9,570,473, and an Expired Premium Tax Allocation of \$237,031.
- (5) For the plan year ending June 30, 2018, all Pension and Relief Funds reported a total of 1,717 eligible active members and 2,165 eligible retired members. The City of Beckley Firemen’s Pension and Relief Fund reported 41 eligible active members and 61 eligible retired members, based on the average number of plan participants for the 12-month period ending June 30, 2018. The Fund is eligible to receive a premium tax allocation of \$463,895 for the fiscal year ending June 30, 2019.
- (6) The total premium tax allocation was assumed to increase by 2.75% in calendar years ending on and after 2019.

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

General Inflation	2.75%																		
Expected Salary Increase	General Inflation: 2.75% <i>plus</i>																		
Service-based Increase:	Wage Inflation Increment: 1.00% <i>plus</i>																		
	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>Years of Service</u></th> <th style="text-align: center;"><u>Increase</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">20.00%</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">6.50%</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">3.50%</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">2.75%</td> </tr> <tr> <td style="text-align: center;">5-9</td> <td style="text-align: center;">2.50%</td> </tr> <tr> <td style="text-align: center;">10-29</td> <td style="text-align: center;">2.00%</td> </tr> <tr> <td style="text-align: center;">30-34</td> <td style="text-align: center;">1.25%</td> </tr> <tr> <td style="text-align: center;">after 34 years of service</td> <td style="text-align: center;">0.00%</td> </tr> </tbody> </table>	<u>Years of Service</u>	<u>Increase</u>	1	20.00%	2	6.50%	3	3.50%	4	2.75%	5-9	2.50%	10-29	2.00%	30-34	1.25%	after 34 years of service	0.00%
<u>Years of Service</u>	<u>Increase</u>																		
1	20.00%																		
2	6.50%																		
3	3.50%																		
4	2.75%																		
5-9	2.50%																		
10-29	2.00%																		
30-34	1.25%																		
after 34 years of service	0.00%																		
Post-retirement COLA	2.75% on first \$15,000 of Annual Benefit and on the accumulated supplemental pension amounts for prior years. Assumed to be payable to all members receiving payments.																		
Increase in State Insurance Premium Tax Allocation	2.75% on and after year 1																		
Cost Method	Entry-Age-Normal, Level-Percentage-of-Pay																		
<i>Amortization Policies:</i>																			
Alternative Plans and former Alternative Plans that selected the Conservation Policy	For GASB 67/68 Accounting: 30 – Year Closed Level-Percentage-of-Pay Amortization (from July 1, 2010 – 23 years remaining as of July 1, 2017).																		
Standard Plans and former Standard Plans that selected the Optional Policy	For funding and GASB 67/68 Accounting: 40-Year Closed Level-Dollar Amortization (from July 1, 1991 – 14 years remaining as of July 1, 2017)																		
Former Alternative Plans that selected the Optional Policy	For funding: 40-Year Closed Level-Dollar Amortization (from January 1, 2010 – 32.5 years remaining as of July 1, 2017). For GASB 67/68 Accounting: 30-Year Closed Level-Percentage-of-Pay Amortization (from July 1, 2010 – 23 years remaining as of July 1, 2017)																		

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

Asset Method	Market Value										
Turnover	<p>Sample Rates –</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Age</u></th> <th style="text-align: right;"><u>Rates</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">25</td> <td style="text-align: right;">9%</td> </tr> <tr> <td style="text-align: left;">35</td> <td style="text-align: right;">4%</td> </tr> <tr> <td style="text-align: left;">45</td> <td style="text-align: right;">2%</td> </tr> <tr> <td style="text-align: left;">50</td> <td style="text-align: right;">0%</td> </tr> </tbody> </table>	<u>Age</u>	<u>Rates</u>	25	9%	35	4%	45	2%	50	0%
<u>Age</u>	<u>Rates</u>										
25	9%										
35	4%										
45	2%										
50	0%										
Retirement	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Age</u></th> <th style="text-align: right;"><u>Rates^a</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">50</td> <td style="text-align: right;">45%</td> </tr> <tr> <td style="text-align: left;">51-55</td> <td style="text-align: right;">30%</td> </tr> <tr> <td style="text-align: left;">56-59</td> <td style="text-align: right;">35%</td> </tr> <tr> <td style="text-align: left;">60</td> <td style="text-align: right;">100%</td> </tr> </tbody> </table> <p>^aTerminated vested participants are assumed to retire at age 50.</p>	<u>Age</u>	<u>Rates^a</u>	50	45%	51-55	30%	56-59	35%	60	100%
<u>Age</u>	<u>Rates^a</u>										
50	45%										
51-55	30%										
56-59	35%										
60	100%										
Mortality	<p>Active: RP-2014 Blue Collar Healthy Employee^b</p> <p>Post-Retirement: RP-2014 Blue Collar Healthy Annuitant</p> <p>Disabled: RP-2014 Blue Collar Healthy Annuitant set forward four years</p> <p>Tables above incorporate generational mortality improvement using MP-2014 2-dimensional mortality improvement scales</p> <p>^bAssumes 10% of deaths are duty-related and 90% are non-duty related.</p>										
Disability	<p>Sample Rates –</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Age</u></th> <th style="text-align: right;"><u>Rates^c</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">30</td> <td style="text-align: right;">0.22%</td> </tr> <tr> <td style="text-align: left;">40</td> <td style="text-align: right;">0.50%</td> </tr> <tr> <td style="text-align: left;">50</td> <td style="text-align: right;">0.79%</td> </tr> </tbody> </table> <p>^cAssumes 60% duty related and 40% non-duty related. Also assumes 10% of non-duty disabled members receive a 20% reduction in benefits due to gainful employment.</p>	<u>Age</u>	<u>Rates^c</u>	30	0.22%	40	0.50%	50	0.79%		
<u>Age</u>	<u>Rates^c</u>										
30	0.22%										
40	0.50%										
50	0.79%										
Percent Married	90%										
Spouse Age	Females 3 years younger than males										

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

Administrative Expenses	Plan year 2018 administrative expenses assumed to be equal to 15% of all reported 2017 expenses. Future expenses assumed to increase by the general inflation assumption.
Refunds Paid	Assumes non-vested inactive members as of July 1, 2017, with accumulated member contribution balances will receive a refund of their contributions during plan year end June 30, 2018.
Data Adjustments and Assumptions	One member marked retired as of July 1, 2016 was actually deceased as of July 1, 2016.
Child Beneficiaries	Future survivor widow benefits are loaded by 12% to estimate impact of benefits provided to survivor children. The load assumes 90% of members are married with two children at time of death, and benefits for each child are paid for approximately 8 years.
General Projection Methodology	<p>Open group projections assume:</p> <ul style="list-style-type: none"> (i) Salaries will increase and members will decrement as specified in the actuarial assumption section. (ii) Active members who retire, become disabled, die or terminate during the year are replaced with new entrants such that the number of active members remains stable during the projection period. Pay for new entrants in future years is increased by the wage inflation assumption. The average age of a new entrant is based on observed experience over the last five years. (iii) Assets grow at the assumed rate of return. (iv) The sponsor makes the statutory required contribution on a monthly basis. (v) Non-vested members with accumulated plan balances as of July 1, 2017, will receive a refund during plan year end June 30, 2018. <p>Closed group projections are the same as the open group projections except active members who retire, become disabled, die, or terminate are <u>not</u> replaced with new entrants.</p>
Decrement Timing	Mid-Year

SECTION VII

SUMMARY OF PRINCIPAL PLAN PROVISIONS

Summary of Principal Plan Provisions

Actuarial Valuation as of July 1, 2017

Employee Eligibility — All compensated employees of the Fire Department are eligible to participate in the Firemen's Pension and Relief Fund.

Average Annual Compensation — The average of any three twelve-consecutive-month periods of employment which produces the highest average annual compensation.

Each twelve-consecutive-month annual compensation is limited to 120% of the *Average Adjusted Salary* received by the member in the two consecutive twelve-consecutive-month periods immediately preceding the twelve-consecutive-month period used in determining benefits.

The *Average Adjusted Salary* is base salary (exclusive of all overtime and other pay) of the year used in determining benefits multiplied by the ratio of total salary (includes all overtime and other pay) to base salary from the respective preceding twelve-consecutive-month period.

Determining Years of Service Credit (Credited Service) — The number of years that the member has contributed to the employees retirement and benefit fund.

Prior Military Service — A city may provide that members who have been honorably discharged from the military shall receive up to two years prior service credit for military service prior to their employment with the city.

Current Military Service — Any current member who has been on qualified military service in the armed forces of the United States with an honorable discharge may, within six months from his or her date of discharge, be given credit for continuous service in the paid police or fire department.

Any member who has served in active duty with the armed forces of the United States, whether prior to or subsequent to becoming a member of a paid police or fire department, shall receive one additional percent for each year so served in active military duty, up to a maximum of four additional percent.

Absence from the service because of sickness or injury for a period of two years or less shall not be construed as time out of service.

Contributions — Participating employees contribute 7.0% of compensation. Participating employees hired on or after January 1, 2010 contribute 9.5% of compensation. The municipality has elected to contribute the minimum employer contribution under the Alternative funding policy.

Normal Retirement — Members are eligible at the earlier of age 50 with 20 years of credited service or age 65.

Benefit Commencement — Annual retirement pension benefits commence upon retirement or upon the member attaining age fifty, whichever is later, payable in twelve monthly installments.

Summary of Principal Plan Provisions

Actuarial Valuation as of July 1, 2017 (Continued)

Accrued Benefit — The annual retirement benefit equals 60% of average annual compensation, not less than \$6,000, plus an additional percentage of average annual compensation for service over 20 years equal to 2% for each year of service between 20 and 25 and 1% for each year of service between 25 and 30 years. Employees serving in the military are eligible for an additional 1% of average annual compensation for each year of military service up to four years. The maximum benefit is limited to 75% of average annual compensation. Benefits continue for life.

Disability Retirement — Members are eligible after earning five years of service. No service requirement if disability is service related.

The monthly disability benefit equals the greater of 60% of monthly salary at disability or \$500. Employees serving in the military are eligible for an additional benefit of 1% of monthly salary at disability for each year of military service up to four years. Disability benefits, when aggregated with monthly state workers compensation benefits, shall not exceed 100% of the member's monthly compensation at the time of disability. Benefits continue for life or until recovery.

Death Benefits — Members are eligible after earning five years of service. No service requirement if death is service related. Retirees and terminated vested participants are also eligible.

The benefit is equal to 60% of the participant's benefit, but not less than \$300 per month, payable to the spouse until death or remarriage. Other dependents (children, parents, brothers and sisters) are also eligible for death benefits. To each dependent child, 20 percent of the participant's benefit until the child attains eighteen or marries; to each dependent orphaned child, 25 percent of the participant's benefit until the child attains 18 or marries; to each dependent parent, 10 percent of the participant's benefit for life, and to each dependent brother or sister, the sum of fifty dollars per month (but a total not to exceed \$100 per month) until such individual attains the age of eighteen years or marries.

In no case shall the payments to the surviving spouse and children be reduced below 65 percent of the total amount paid to all dependents.

Supplemental Pension Benefits — All retirees, surviving beneficiaries and disability pensioners are eligible for automatic cost-of-living benefits commencing on the first day of July following two years of retirement. The benefits equal the percentage increase in the Consumer Price Index, limited to 4% (2% for some disability retirees), multiplied by the sum of the allowable amount which is the first \$15,000 of the total annual benefits paid and the accumulated supplemental pension amounts for prior years.

Termination Benefits — Any member who terminates employment prior to retirement will be entitled to a refund of contributions without interest.

Refunds — Any member who terminates from their department without receiving a retirement pension shall be refunded all deductions made from his salary, without interest. Any member who receives such a refund and subsequently wishes to reenter the department must repay to the pension fund all sums refunded with interest at the rate of eight percent annual.

SECTION VIII

APPENDIX – PROJECTION DATA

Actuarial Projections – Optional Funding in 2019

Table A-1

Valuation Plan Year End 30-Jun	Number		Total Assets								Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
			Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Premium Tax		Assets (eoy)			
	Allocation Contribs.	Investment Income											
Pay Active	Status												
2017	41	58	\$16,966,940	\$1,843,155	\$24	\$629,465	\$174,158	\$428,814	\$1,387,931	\$17,744,129	\$46,089,126	\$28,344,997	38%
2018	37	61	17,744,129	2,041,951	8,931	673,524	168,295	443,192	781,443	17,759,701	47,296,299	29,536,598	38%
2019	34	62	17,759,701	2,156,194	9,027	2,210,766	162,245	463,895	814,133	19,245,519	48,381,772	29,136,253	40%
2020	31	64	19,245,519	2,248,292	9,130	2,226,147	156,800	490,176	879,750	20,740,970	49,370,497	28,629,527	42%
2021	29	63	20,740,970	2,318,524	9,244	2,167,635	152,953	506,465	944,454	22,184,709	50,293,246	28,108,537	44%
2022	26	65	22,184,709	2,391,475	9,265	2,120,555	149,106	516,976	1,006,899	23,577,504	51,147,129	27,569,625	46%
2023	24	65	23,577,504	2,487,850	9,392	2,070,907	142,517	533,126	1,066,536	24,893,349	51,883,649	26,990,300	48%
2024	21	65	24,893,349	2,595,855	9,419	2,005,762	135,000	546,938	1,122,035	26,097,810	52,478,292	26,380,482	50%
2025	20	66	26,097,810	2,686,529	9,442	1,931,936	129,055	561,719	1,172,772	27,197,321	52,954,840	25,757,519	51%
2026	18	66	27,197,321	2,749,136	9,570	1,867,254	125,528	577,322	1,219,682	28,228,401	53,356,040	25,127,639	53%
2027	16	67	28,228,401	2,822,111	9,702	1,819,325	121,106	593,522	1,263,650	29,194,191	53,661,349	24,467,158	54%
2028	15	67	29,194,191	2,888,249	9,834	1,765,334	117,134	611,372	1,304,743	30,094,691	53,876,276	23,781,585	56%
2029	13	68	30,094,691	2,952,550	9,964	1,714,888	112,776	627,682	1,342,975	30,930,499	53,995,687	23,065,188	57%
2030	12	68	30,930,499	3,019,435	10,093	1,659,474	107,444	646,364	1,378,160	31,692,413	54,007,141	22,314,728	59%
2031	11	68	31,692,413	3,066,308	10,218	1,600,972	103,060	663,682	1,410,386	32,393,987	53,934,901	21,540,914	60%
2032	10	67	32,393,987	3,105,013	10,337	1,548,802	98,894	681,518	1,440,236	33,048,087	53,785,531	20,737,444	61%
2033	9	67	33,048,087	3,141,268	10,449	1,498,865	93,665	699,493	1,468,034	33,656,427	53,554,321	19,897,894	63%
2034	8	67	33,656,427	3,168,439	10,553	1,445,129	88,177	718,668	1,493,911	34,223,320	53,247,045	19,023,725	64%
2035	7	66	34,223,320	3,207,609	10,652	1,391,364	82,898	737,884	1,517,661	34,734,865	52,848,433	18,113,568	66%
2036	6	66	34,734,865	3,252,662	10,740	1,336,697	75,923	758,176	1,538,755	35,181,014	52,337,770	17,156,756	67%
2037	5	66	35,181,014	3,289,482	10,817	1,273,184	66,581	778,463	1,556,841	35,555,784	51,706,451	16,150,667	69%
2038	4	65	35,555,784	3,328,135	10,887	1,197,022	56,537	800,972	1,571,427	35,842,720	50,944,435	15,101,715	70%
2039	3	64	35,842,720	3,351,860	10,942	1,116,913	47,725	824,075	1,582,346	36,050,977	50,069,563	14,018,586	72%
2040	2	63	36,050,977	3,369,821	10,982	1,042,018	38,996	848,253	1,589,994	36,189,435	49,084,415	12,894,980	74%
2041	2	62	36,189,435	3,366,511	11,005	967,736	32,511	873,726	1,595,067	36,280,960	48,019,661	11,738,701	76%
2042	1	61	36,280,960	3,377,359	11,011	905,720	24,777	898,008	1,597,932	36,319,028	46,854,999	10,535,971	78%
2043	1	59	36,319,028	3,388,222	10,999	840,269	16,303	925,747	1,598,376	36,300,502	45,583,876	9,283,374	80%
2044	0	58	36,300,502	3,360,098	10,970	774,229	11,434	952,205	1,597,180	36,264,482	44,258,839	7,994,357	82%
2045	0	56	36,264,482	3,319,209	10,924	720,381	7,867	978,834	1,595,785	36,237,215	42,897,244	6,660,029	84%
2046	0	54	36,237,215	3,267,347	10,862	673,267	5,396	1,005,428	1,595,201	36,238,298	41,514,515	5,276,217	87%
2047	0	52	36,238,298	3,207,458	10,786	630,915	3,665	1,032,465	1,596,205	36,283,304	40,121,935	3,838,631	90%
2048	0	51	36,283,304	3,142,263	10,696	591,435	2,442	1,060,116	1,599,393	36,383,730	38,727,181	2,343,451	94%
2049	0	49	36,383,730	3,073,754	10,596	553,428	1,523	1,088,124	1,605,196	36,547,651	37,335,099	787,448	98%
2050	0	47	36,547,651	3,002,358	10,485	16,254	912	802,506	1,595,841	35,950,321	35,950,321	0	100%
2051	0	45	35,950,321	2,928,816	10,367	12,374	561	0	1,552,648	34,576,721	34,576,721	0	100%
2052	0	43	34,576,721	2,855,288	10,242	11,055	227	0	1,492,439	33,214,912	33,214,912	0	100%
2053	0	42	33,214,912	2,781,316	10,113	10,113	0	0	1,432,780	31,866,376	31,866,376	0	100%
2054	0	40	31,866,376	2,706,236	9,980	9,979	0	0	1,373,767	30,533,906	30,533,905	0	100%
2055	0	38	30,533,906	2,631,856	9,844	9,844	0	0	1,315,461	29,217,511	29,217,510	0	100%
2056	0	37	29,217,511	2,558,196	9,707	9,707	0	0	1,257,862	27,917,177	27,917,176	0	100%
2057	0	35	27,917,177	2,485,176	9,568	9,570	0	0	1,200,972	26,632,974	26,632,973	0	100%

Actuarial Projections – Optional Funding in 2019

Table A-2

Employer Contributions

Valuation Plan Year End 30-Jun ^a	Closed Group Payroll	New Entrant Payroll	Total Payroll	Employee Contributions	Gross Normal Cost	Net Employer Normal Cost	Amortization of UAAL	Premium Tax Allocation Contributions	Net Employer Amortization Expenses	Optional Employer Contribution	Statewide Employer Contribution	
2018	\$2,183,999	\$0	\$2,183,999	\$168,295	\$1,194,011	\$1,025,716	\$1,640,014	\$463,895	\$1,176,119	\$8,931	\$2,210,766	\$0
2019	2,089,831	160,719	2,250,550	162,245	1,136,060	973,815	1,733,481	490,176	1,243,305	9,027	2,226,147	16,875
2020	2,007,514	303,569	2,311,083	156,800	1,085,753	928,953	1,736,017	506,465	1,229,552	9,130	2,167,635	31,875
2021	1,948,225	464,381	2,412,606	152,953	1,047,838	894,885	1,733,401	516,976	1,216,425	9,244	2,120,555	48,760
2022	1,888,636	590,918	2,479,555	149,106	1,012,773	863,667	1,731,101	533,126	1,197,975	9,265	2,070,907	62,046
2023	1,789,225	752,171	2,541,396	142,517	956,868	814,351	1,728,958	546,938	1,182,020	9,392	2,005,762	78,978
2024	1,675,811	924,750	2,600,561	135,000	893,636	758,636	1,725,600	561,719	1,163,881	9,419	1,931,936	97,099
2025	1,584,350	1,119,089	2,703,439	129,055	842,531	713,476	1,721,659	577,322	1,144,337	9,442	1,867,254	117,504
2026	1,526,935	1,286,473	2,813,407	125,528	810,489	684,961	1,718,316	593,522	1,124,794	9,570	1,819,325	135,080
2027	1,456,188	1,457,822	2,914,009	121,106	772,008	650,902	1,716,102	611,372	1,104,730	9,702	1,765,334	153,071
2028	1,391,076	1,649,543	3,040,619	117,134	736,354	619,220	1,713,516	627,682	1,085,834	9,834	1,714,888	173,202
2029	1,319,659	1,823,274	3,142,933	112,776	697,650	584,874	1,711,001	646,364	1,064,637	9,964	1,659,474	191,444
2030	1,238,908	2,036,860	3,275,768	107,444	653,781	546,337	1,708,224	663,682	1,044,542	10,093	1,600,972	213,870
2031	1,175,239	2,238,076	3,413,315	103,060	618,160	515,100	1,705,003	681,518	1,023,485	10,218	1,548,802	234,998
2032	1,116,023	2,449,615	3,565,638	98,894	584,680	485,786	1,702,235	699,493	1,002,742	10,337	1,498,865	257,210
2033	1,051,472	2,661,339	3,712,811	93,665	547,459	453,794	1,699,555	718,668	980,887	10,449	1,445,129	279,441
2034	987,169	2,898,556	3,885,724	88,177	510,331	422,154	1,696,540	737,884	958,656	10,553	1,391,364	304,348
2035	917,936	3,129,137	4,047,074	82,898	473,719	390,821	1,693,400	758,176	935,224	10,652	1,336,697	328,559
2036	828,333	3,384,159	4,212,492	75,923	426,708	350,785	1,690,121	778,463	911,658	10,740	1,273,184	355,337
2037	721,335	3,652,314	4,373,649	66,581	367,980	301,399	1,685,778	800,972	884,806	10,817	1,197,022	383,493
2038	609,445	3,926,908	4,536,353	56,537	306,567	250,030	1,680,072	824,075	855,997	10,887	1,116,913	412,325
2039	512,130	4,185,355	4,697,485	47,725	253,440	205,715	1,673,614	848,253	825,361	10,942	1,042,018	439,462
2040	417,003	4,437,537	4,854,539	38,996	202,029	163,033	1,667,447	873,726	793,721	10,982	967,736	465,941
2041	346,673	4,694,891	5,041,565	32,511	164,215	131,704	1,661,020	898,008	763,012	11,005	905,720	492,964
2042	263,657	4,924,746	5,188,403	24,777	124,202	99,425	1,655,580	925,747	729,833	11,011	840,269	517,098
2043	173,534	5,189,614	5,363,148	16,303	82,193	65,890	1,649,545	952,205	697,340	10,999	774,229	544,909
2044	121,655	5,425,349	5,547,003	11,434	57,293	45,859	1,642,386	978,834	663,552	10,970	720,381	569,662
2045	83,329	5,660,567	5,743,895	7,867	38,950	31,083	1,636,687	1,005,428	631,259	10,924	673,267	594,359
2046	56,800	5,891,589	5,948,389	5,396	26,363	20,967	1,631,551	1,032,465	599,086	10,862	630,915	618,617
2047	38,575	6,122,859	6,161,434	3,665	17,705	14,040	1,626,724	1,060,116	566,608	10,786	591,435	642,900
2048	25,706	6,359,260	6,384,966	2,442	11,682	9,240	1,621,615	1,088,124	533,491	10,696	553,428	667,722
2049	16,029	6,601,064	6,617,092	1,523	7,181	5,658	1,614,574	802,506	497,629	10,596	16,254	693,112
2050	9,601	6,851,303	6,860,905	912	4,221	3,309	0	0	0	10,485	12,374	719,387
2051	5,903	7,111,617	7,117,520	561	2,568	2,007	0	0	0	10,367	11,055	746,720
2052	2,390	7,383,002	7,385,392	227	1,036	809	0	0	0	10,242	10,113	775,215
2053	0	7,666,536	7,666,536	0	0	0	0	0	0	10,113	9,979	804,986
2054	0	7,963,160	7,963,160	0	0	0	0	0	0	9,980	9,844	836,132
2055	0	8,272,394	8,272,394	0	0	0	0	0	0	9,844	9,707	868,601
2056	0	8,596,008	8,596,008	0	0	0	0	0	0	9,707	9,570	902,581
2057	0	8,931,382	8,931,382	0	0	0	0	0	0	9,568	9,428	937,795

^a Assumes employer makes contributions for the applicable valuation plan year in the following fiscal year.

^b Amount required to remain at 100% funded.

Actuarial Projections – Conservation Funding in 2019

Table A-3

Valuation			Total Assets										Actuarial		
Plan	Number		Assets	Benefit	Expenses	Employer	Employee	Premium Tax		Assets	Accrued	Unfunded	Funded		
	Year End	Pay						Allocation	Investment					Liability	Liability
30-Jun	Active	Status	(boy)	Payments		Contribs.	Contribs.	Contribs.	Income	(eoy)					
2017	41	58	\$16,966,940	\$1,843,155	\$24	\$629,465	\$174,158	\$428,814	\$1,387,931	\$17,744,129	\$46,089,126	\$28,344,997	38%		
2018	37	61	17,744,129	2,041,951	8,931	673,524	168,295	443,192	781,443	17,759,701	47,296,299	29,536,598	38%		
2019	34	62	17,759,701	2,156,194	9,027	1,570,428	162,245	463,895	799,884	18,590,932	48,381,772	29,790,840	38%		
2020	31	64	18,590,932	2,248,292	9,130	1,640,559	156,800	490,176	837,262	19,458,307	49,370,497	29,912,190	39%		
2021	29	63	19,458,307	2,318,524	9,244	1,697,573	152,953	506,465	876,274	20,363,804	50,293,246	29,929,442	40%		
2022	26	65	20,363,804	2,391,475	9,265	1,762,988	149,106	516,976	917,002	21,309,136	51,147,129	29,837,993	42%		
2023	24	65	21,309,136	2,487,850	9,392	1,848,437	142,517	533,126	959,508	22,295,482	51,883,649	29,588,167	43%		
2024	21	65	22,295,482	2,595,855	9,419	1,948,473	135,000	546,938	1,003,856	23,324,475	52,478,292	29,153,817	44%		
2025	20	66	23,324,475	2,686,529	9,442	2,028,962	129,055	561,719	1,050,130	24,398,370	52,954,840	28,556,470	46%		
2026	18	66	24,398,370	2,749,136	9,570	2,078,760	125,528	577,322	1,098,436	25,519,710	53,356,040	27,836,330	48%		
2027	16	67	25,519,710	2,822,111	9,702	2,139,028	121,106	593,522	1,148,873	26,690,426	53,661,349	26,970,923	50%		
2028	15	67	26,690,426	2,888,249	9,834	2,190,443	117,134	611,372	1,201,533	27,912,825	53,876,276	25,963,451	52%		
2029	13	68	27,912,825	2,952,550	9,964	2,241,851	112,776	627,682	1,256,518	29,189,138	53,995,687	24,806,549	54%		
2030	12	68	29,189,138	3,019,435	10,093	2,294,304	107,444	646,364	1,313,925	30,521,647	54,007,141	23,485,494	57%		
2031	11	68	30,521,647	3,066,308	10,218	2,327,413	103,060	663,682	1,373,866	31,913,142	53,934,901	22,021,759	59%		
2032	10	67	31,913,142	3,105,013	10,337	2,351,678	98,894	681,518	1,436,464	33,366,346	53,785,531	20,419,185	62%		
2033	9	67	33,366,346	3,141,268	10,449	2,374,331	93,665	699,493	1,501,837	34,883,955	53,554,321	18,670,366	65%		
2034	8	67	34,883,955	3,168,439	10,553	2,386,955	88,177	718,668	1,570,107	36,468,870	53,247,045	16,778,175	68%		
2035	7	66	36,468,870	3,207,609	10,652	2,411,248	82,898	737,884	1,641,406	38,124,045	52,848,433	14,724,388	72%		
2036	6	66	38,124,045	3,252,662	10,740	2,441,728	75,923	758,176	1,715,859	39,852,329	52,337,770	12,485,441	76%		
2037	5	66	39,852,329	3,289,482	10,817	2,466,075	66,581	778,463	1,793,596	41,656,745	51,706,451	10,049,706	81%		
2038	4	65	41,656,745	3,328,135	10,887	2,490,655	56,537	800,972	1,874,757	43,540,644	50,944,435	7,403,791	85%		
2039	3	64	43,540,644	3,351,860	10,942	2,498,684	47,725	824,075	1,959,500	45,507,826	50,069,563	4,561,737	91%		
2040	2	63	45,507,826	3,369,821	10,982	2,499,809	38,996	848,253	2,047,991	47,562,072	49,084,415	1,522,343	97%		
2041	2	62	47,562,072	3,366,511	11,005	825,204	32,511	873,726	2,103,664	48,019,661	48,019,661	0	100%		
2042	1	61	48,019,661	3,377,359	11,011	110,437	24,777	0	2,088,494	46,854,999	46,854,999	0	100%		
2043	1	59	46,854,999	3,388,222	10,999	76,887	16,303	0	2,034,908	45,583,876	45,583,876	0	100%		
2044	0	58	45,583,876	3,360,098	10,970	56,819	11,434	0	1,977,779	44,258,839	44,258,839	0	100%		
2045	0	56	44,258,839	3,319,209	10,924	42,015	7,867	0	1,918,654	42,897,243	42,897,244	0	100%		
2046	0	54	42,897,243	3,267,347	10,862	31,829	5,396	0	1,858,256	41,514,514	41,514,515	0	100%		
2047	0	52	41,514,514	3,207,458	10,786	24,826	3,665	0	1,797,173	40,121,934	40,121,935	0	100%		
2048	0	51	40,121,934	3,142,263	10,696	19,939	2,442	0	1,735,824	38,727,180	38,727,181	0	100%		
2049	0	49	38,727,180	3,073,754	10,596	16,260	1,523	0	1,674,485	37,335,098	37,335,099	0	100%		
2050	0	47	37,335,098	3,002,358	10,485	13,789	912	0	1,613,364	35,950,320	35,950,321	0	100%		
2051	0	45	35,950,320	2,928,816	10,367	12,374	561	0	1,552,648	34,576,720	34,576,721	0	100%		
2052	0	43	34,576,720	2,855,288	10,242	11,054	227	0	1,492,439	33,214,910	33,214,911	0	100%		
2053	0	42	33,214,910	2,781,316	10,113	10,113	0	0	1,432,780	31,866,373	31,866,375	0	100%		
2054	0	40	31,866,373	2,706,236	9,980	9,980	0	0	1,373,767	30,533,906	30,533,905	0	100%		
2055	0	38	30,533,906	2,631,856	9,844	9,844	0	0	1,315,461	29,217,511	29,217,510	0	100%		
2056	0	37	29,217,511	2,558,196	9,707	9,706	0	0	1,257,862	27,917,176	27,917,176	0	100%		
2057	0	35	27,917,176	2,485,176	9,568	9,569	0	0	1,200,972	26,632,973	26,632,973	0	100%		

Actuarial Projections – Conservation Funding in 2019

Table A-4

Plan Year End 30-Jun	Benefit Payment Account ^a							Accumulation Account ^b					Statewide Employer Contribution	
	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	5.50% of Pay Employee Contribs.	100.00% of Premium Tax Allocation	Investment Income	Transfer (To)/From Accumulation Account	Assets (boy) ^c	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Employee Contribs.	0.00% of Premium Tax Allocation		Investment Income
2018	\$17,744,129	\$2,050,882	\$673,524	\$168,295	\$443,192	\$781,443	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	17,759,701	2,165,221	1,570,428	130,898	463,895	799,187	(18,558,888)	18,558,888	0	0	31,347	0	698	16,875
2020	0	2,257,422	1,640,559	126,687	490,176	0	0	18,590,933	0	0	30,113	0	837,262	31,875
2021	0	2,327,768	1,697,573	123,730	506,465	0	0	19,458,308	0	0	29,223	0	876,274	48,760
2022	0	2,400,740	1,762,988	120,776	516,976	0	0	20,363,805	0	0	28,330	0	917,002	62,046
2023	0	2,497,242	1,848,437	115,679	533,126	0	0	21,309,137	0	0	26,838	0	959,508	78,978
2024	0	2,605,274	1,948,473	109,863	546,938	0	0	22,295,483	0	0	25,137	0	1,003,856	97,099
2025	0	2,695,971	2,028,962	105,290	561,719	0	0	23,324,476	0	0	23,765	0	1,050,130	117,504
2026	0	2,758,706	2,078,760	102,624	577,322	0	0	24,398,371	0	0	22,904	0	1,098,436	135,080
2027	0	2,831,813	2,139,028	99,263	593,522	0	0	25,519,711	0	0	21,843	0	1,148,873	153,071
2028	0	2,898,083	2,190,443	96,268	611,372	0	0	26,690,427	0	0	20,866	0	1,201,534	173,202
2029	0	2,962,514	2,241,851	92,981	627,682	0	0	27,912,827	0	0	19,795	0	1,256,518	191,444
2030	0	3,029,528	2,294,304	88,860	646,364	0	0	29,189,140	0	0	18,584	0	1,313,925	213,870
2031	0	3,076,526	2,327,413	85,431	663,682	0	0	30,521,649	0	0	17,629	0	1,373,866	234,998
2032	0	3,115,350	2,351,678	82,154	681,518	0	0	31,913,144	0	0	16,740	0	1,436,464	257,210
2033	0	3,151,717	2,374,331	77,893	699,493	0	0	33,366,348	0	0	15,772	0	1,501,837	279,441
2034	0	3,178,992	2,386,955	73,369	718,668	0	0	34,883,957	0	0	14,808	0	1,570,108	304,348
2035	0	3,218,261	2,411,248	69,129	737,884	0	0	36,468,873	0	0	13,769	0	1,641,406	328,559
2036	0	3,263,402	2,441,728	63,498	758,176	0	0	38,124,048	0	0	12,425	0	1,715,859	355,337
2037	0	3,300,299	2,466,075	55,761	778,463	0	0	39,852,332	0	0	10,820	0	1,793,596	383,493
2038	0	3,339,022	2,490,655	47,395	800,972	0	0	41,656,748	0	0	9,142	0	1,874,757	412,325
2039	0	3,362,802	2,498,684	40,043	824,075	0	0	43,540,647	0	0	7,682	0	1,959,500	439,462
2040	0	3,380,803	2,499,809	32,741	848,253	0	0	45,507,829	0	0	6,255	0	2,047,991	465,941
2041	0	1,726,241	825,204	27,311	873,726	0	0	47,562,075	1,651,275	0	5,200	0	2,103,664	492,964
2042	0	0	0	0	0	0	0	48,019,664	3,388,370	110,437	24,777	0	2,088,494	517,098
2043	0	0	0	0	0	0	0	46,855,002	3,399,221	76,887	16,303	0	2,034,908	544,909
2044	0	0	0	0	0	0	0	45,583,879	3,371,068	56,819	11,434	0	1,977,779	569,662
2045	0	0	0	0	0	0	0	44,258,843	3,330,133	42,015	7,867	0	1,918,654	594,359
2046	0	0	0	0	0	0	0	42,897,246	3,278,209	31,829	5,396	0	1,858,256	618,617
2047	0	0	0	0	0	0	0	41,514,518	3,218,244	24,826	3,665	0	1,797,174	642,900
2048	0	0	0	0	0	0	0	40,121,939	3,152,959	19,939	2,442	0	1,735,824	667,722
2049	0	0	0	0	0	0	0	38,727,185	3,084,350	16,260	1,523	0	1,674,485	693,112
2050	0	0	0	0	0	0	0	37,335,103	3,012,843	13,789	912	0	1,613,364	719,387
2051	0	0	0	0	0	0	0	35,950,325	2,939,183	12,374	561	0	1,552,649	746,720
2052	0	0	0	0	0	0	0	34,576,726	2,865,530	11,054	227	0	1,492,439	775,215
2053	0	0	0	0	0	0	0	33,214,916	2,791,429	10,113	0	0	1,432,780	804,986
2054	0	0	0	0	0	0	0	31,866,380	2,716,216	9,980	0	0	1,373,767	836,132
2055	0	0	0	0	0	0	0	30,533,911	2,641,700	9,844	0	0	1,315,461	868,601
2056	0	0	0	0	0	0	0	29,217,516	2,567,903	9,706	0	0	1,257,862	902,581
2057	0	0	0	0	0	0	0	27,917,181	2,494,744	9,569	0	0	1,200,972	937,795

^a Employer contributions paid from the City's General Fund are used to finance benefits not covered by the applicable employee contributions or premium tax allocation.

^b Assets accumulate in the Pension and Relief Fund.

^c Includes transfer from Benefit Payment Account to Accumulation Account in Plan Year End June 30, 2018

Actuarial Projections – Optional Funding in (N/A)

Table A-5

Valuation Plan	Total Assets													
	Number		Assets							Premium Tax		Actuarial Liability	Unfunded Liability	Funded Ratio
	Year End	Pay	Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Allocation Contribs.	Investment Income	Assets (eoy)				
30-Jun	Active	Status												
2017	41	58	\$16,966,940	\$1,843,155	\$24	\$629,465	\$174,158	\$428,814	\$1,387,931	\$17,744,129	\$46,089,126	\$28,344,997	38%	
2018	41	61	17,744,129	2,041,951	8,931	673,524	168,295	443,192	781,443	17,759,701	47,296,300	29,536,599	38%	
2019	41	62	17,759,701	2,156,194	9,418	720,671	178,903	463,895	781,337	17,738,895	48,467,391	30,728,496	37%	
2020	41	64	17,738,895	2,248,818	9,815	771,118	187,161	490,176	780,222	17,708,940	49,620,908	31,911,968	36%	
2021	41	63	17,708,940	2,320,495	10,249	825,096	198,872	506,465	779,093	17,687,722	50,800,273	33,112,551	35%	
2022	41	65	17,687,722	2,395,585	10,491	882,853	206,945	516,976	778,161	17,666,580	51,987,991	34,321,411	34%	
2023	41	65	17,666,580	2,494,636	10,916	944,653	216,142	533,126	776,936	17,631,885	53,157,292	35,525,407	33%	
2024	41	65	17,631,885	2,605,719	11,249	1,010,779	225,420	546,938	774,880	17,572,934	54,293,641	36,720,707	32%	
2025	41	66	17,572,934	2,700,173	11,610	1,081,534	238,457	561,719	772,311	17,515,172	55,436,728	37,921,556	32%	
2026	41	67	17,515,172	2,767,308	11,994	1,157,241	250,998	577,322	770,520	17,491,951	56,619,964	39,128,013	31%	
2027	41	67	17,491,951	2,845,472	12,383	1,238,248	263,218	593,522	770,162	17,499,246	57,829,734	40,330,488	30%	
2028	41	67	17,499,246	2,917,281	12,807	1,324,925	278,006	611,372	771,538	17,554,999	59,087,456	41,532,457	30%	
2029	41	68	17,554,999	2,987,875	13,172	1,417,670	290,445	627,682	775,171	17,664,920	60,384,054	42,719,134	29%	
2030	41	68	17,664,920	3,061,649	13,618	1,516,907	306,184	646,364	781,441	17,840,549	61,733,767	43,893,218	29%	
2031	41	68	17,840,549	3,116,218	14,010	1,623,090	321,370	663,682	791,207	18,109,670	63,160,819	45,051,149	29%	
2032	41	68	18,109,670	3,163,379	14,408	1,736,706	337,934	681,518	805,553	18,493,595	64,683,980	46,190,385	29%	
2033	41	68	18,493,595	3,208,757	14,785	1,858,275	353,420	699,493	825,261	19,006,501	66,305,859	47,299,358	29%	
2034	41	68	19,006,501	3,245,713	15,196	1,988,354	371,304	718,668	851,229	19,675,148	68,052,914	48,377,766	29%	
2035	41	68	19,675,148	3,295,848	15,568	2,127,539	388,590	737,884	884,104	20,501,848	69,914,400	49,412,552	29%	
2036	41	67	20,501,848	3,352,916	15,967	2,276,467	406,791	758,176	924,198	21,498,597	71,891,269	50,392,672	30%	
2037	41	67	21,498,597	3,402,573	16,362	2,435,820	421,671	778,463	972,266	22,687,881	73,991,323	51,303,442	31%	
2038	41	67	22,687,881	3,455,047	16,790	2,606,327	435,031	800,972	1,029,199	24,087,572	76,207,371	52,119,799	32%	
2039	41	67	24,087,572	3,503,131	17,231	2,788,770	448,608	824,075	1,095,982	25,724,644	78,534,451	52,809,807	33%	
2040	41	67	25,724,644	3,568,672	17,692	2,983,984	462,133	848,253	1,173,364	27,606,014	80,961,156	53,355,142	34%	
2041	41	67	27,606,014	3,632,143	18,183	3,192,863	478,545	873,726	1,262,182	29,763,005	83,511,036	53,748,031	36%	
2042	41	67	29,763,005	3,728,125	18,634	3,416,363	490,526	898,008	1,362,882	32,184,024	86,140,673	53,956,649	37%	
2043	41	67	32,184,024	3,840,942	19,182	3,655,508	505,667	925,747	1,475,580	34,886,402	88,850,350	53,963,948	39%	
2044	41	67	34,886,402	3,933,998	19,686	3,911,394	521,796	952,205	1,601,747	37,919,859	91,666,152	53,746,293	41%	
2045	41	66	37,919,859	4,032,976	20,203	4,185,192	539,740	978,834	1,743,123	41,313,569	94,596,530	53,282,961	44%	
2046	41	66	41,313,569	4,136,614	20,713	4,478,155	558,161	1,005,428	1,901,043	45,099,029	97,649,004	52,549,975	46%	
2047	41	66	45,099,029	4,245,021	21,231	4,791,626	577,921	1,032,465	2,076,982	49,311,770	100,828,487	51,516,717	49%	
2048	41	66	49,311,770	4,361,423	21,759	5,127,040	598,868	1,060,116	2,272,499	53,987,111	104,141,839	50,154,728	52%	
2049	41	65	53,987,111	4,484,696	22,293	5,485,933	620,679	1,088,124	2,489,229	59,164,087	107,595,913	48,431,826	55%	
2050	41	65	59,164,087	4,612,451	22,841	5,869,948	643,949	1,116,945	2,729,042	64,888,679	111,198,602	46,309,923	58%	
2051	41	65	64,888,679	4,745,632	23,401	6,280,844	668,594	1,146,405	2,994,020	71,209,508	114,960,377	43,750,869	62%	
2052	41	64	71,209,508	4,884,239	23,974	6,720,503	694,267	1,176,610	3,286,388	78,179,063	118,889,919	40,710,856	66%	
2053	41	64	78,179,063	5,027,191	24,564	7,190,938	721,404	1,207,770	3,608,588	85,856,008	122,997,933	37,141,925	70%	
2054	41	64	85,856,008	5,173,518	25,172	7,694,304	750,077	1,239,843	3,963,334	94,304,877	127,297,730	32,992,853	74%	
2055	41	64	94,304,877	5,324,556	25,796	8,232,905	779,790	1,272,993	4,353,543	103,593,755	131,800,659	28,206,904	79%	
2056	41	63	103,593,755	5,479,748	26,444	8,809,208	810,683	1,307,464	4,782,353	113,797,271	136,517,973	22,720,702	83%	
2057	41	63	113,797,271	5,640,389	27,115	9,425,853	842,403	1,343,241	5,253,145	124,994,409	141,458,751	16,464,342	88%	

Actuarial Projections – Optional Funding in (N/A)

Table A-6

Valuation Plan Year End 30-Jun ^{a,b}	Employer Contributions								Minimum Payment			Statewide Employer Contribution
	Total Payroll	Employee Contributions	Gross Normal Cost	Net Employer Normal Cost	Amortization of UAAL	Premium Tax Allocation Contributions	Net Employer Amortization	Expenses	Optional Employer Contribution	Alternative Employer Contribution	Minimum Employer Contribution	
2018	\$2,183,999	\$168,295	\$1,194,011	\$1,025,716	\$1,640,014	\$463,895	\$1,176,119	\$8,931	\$2,210,766	\$720,671	\$720,671	\$0
2019	2,250,550	178,903	1,220,338	1,041,435	1,733,481	490,176	1,243,305	9,418	2,294,157	771,118	771,118	0
2020	2,311,083	187,161	1,245,171	1,058,010	1,830,888	506,465	1,324,423	9,815	2,392,247	825,096	825,096	0
2021	2,412,606	198,872	1,291,973	1,093,101	1,932,140	516,976	1,415,164	10,249	2,518,515	882,853	882,853	0
2022	2,479,555	206,945	1,323,806	1,116,862	2,039,280	533,126	1,506,154	10,491	2,633,506	944,653	944,653	0
2023	2,541,396	216,142	1,353,092	1,136,949	2,152,379	546,938	1,605,441	10,916	2,753,306	1,010,779	1,010,779	0
2024	2,600,561	225,420	1,381,123	1,155,703	2,271,284	561,719	1,709,565	11,249	2,876,517	1,081,534	1,081,534	0
2025	2,703,439	238,457	1,432,827	1,194,370	2,396,490	577,322	1,819,168	11,610	3,025,148	1,157,241	1,157,241	0
2026	2,813,407	250,998	1,489,612	1,238,614	2,529,794	593,522	1,936,272	11,994	3,186,880	1,238,248	1,238,248	0
2027	2,914,009	263,218	1,542,135	1,278,917	2,672,264	611,372	2,060,892	12,383	3,352,192	1,324,925	1,324,925	0
2028	3,040,619	278,006	1,608,263	1,330,257	2,824,477	627,682	2,196,795	12,807	3,539,859	1,417,670	1,417,670	0
2029	3,142,933	290,445	1,662,024	1,371,579	2,988,114	646,364	2,341,750	13,172	3,726,501	1,516,907	1,516,907	0
2030	3,275,768	306,184	1,731,597	1,425,414	3,163,810	663,682	2,500,128	13,618	3,939,160	1,623,090	1,623,090	0
2031	3,413,315	321,370	1,803,058	1,481,687	3,353,753	681,518	2,672,235	14,010	4,167,932	1,736,706	1,736,706	0
2032	3,565,638	337,934	1,882,166	1,544,232	3,560,092	699,493	2,860,599	14,408	4,419,239	1,858,275	1,858,275	0
2033	3,712,811	353,420	1,957,729	1,604,310	3,785,573	718,668	3,066,905	14,785	4,685,999	1,988,354	1,988,354	0
2034	3,885,724	371,304	2,046,846	1,675,542	4,032,852	737,884	3,294,968	15,196	4,985,706	2,127,539	2,127,539	0
2035	4,047,074	388,590	2,133,119	1,744,529	4,306,354	758,176	3,548,178	15,568	5,308,275	2,276,467	2,276,467	0
2036	4,212,492	406,791	2,221,924	1,815,133	4,610,531	778,463	3,832,068	15,967	5,663,169	2,435,820	2,435,820	0
2037	4,373,649	421,671	2,306,058	1,884,387	4,951,453	800,972	4,150,481	16,362	6,051,230	2,606,327	2,606,327	0
2038	4,536,353	435,031	2,390,089	1,955,059	5,336,838	824,075	4,512,763	16,790	6,484,612	2,788,770	2,788,770	0
2039	4,697,485	448,608	2,472,456	2,023,848	5,776,061	848,253	4,927,808	17,231	6,968,887	2,983,984	2,983,984	0
2040	4,854,539	462,133	2,552,211	2,090,078	6,281,486	873,726	5,407,760	17,692	7,515,530	3,192,863	3,192,863	0
2041	5,041,565	478,545	2,647,706	2,169,161	6,872,750	898,008	5,974,742	18,183	8,162,085	3,416,363	3,416,363	0
2042	5,188,403	490,526	2,726,286	2,235,761	7,580,412	925,747	6,654,665	18,634	8,909,060	3,655,508	3,655,508	0
2043	5,363,148	505,667	2,820,866	2,315,199	8,447,623	952,205	7,495,418	19,182	9,829,800	3,911,394	3,911,394	0
2044	5,547,003	521,796	2,917,159	2,395,363	9,547,135	978,834	8,568,301	19,686	10,983,350	4,185,192	4,185,192	0
2045	5,743,895	539,740	3,019,875	2,480,136	11,003,494	1,005,428	9,998,066	20,203	12,498,404	4,478,155	4,478,155	0
2046	5,948,389	558,161	3,126,757	2,568,596	13,053,074	1,032,465	12,020,609	20,713	14,609,918	4,791,626	4,791,626	0
2047	6,161,434	577,921	3,238,342	2,660,421	16,201,816	1,060,116	15,141,700	21,231	17,823,353	5,127,040	5,127,040	0
2048	6,384,966	598,868	3,355,912	2,757,043	21,763,035	1,088,124	20,674,911	21,759	23,453,713	5,485,933	5,485,933	0
2049	6,617,092	620,679	3,478,358	2,857,679	34,555,246	1,116,945	33,438,301	22,293	36,318,273	5,869,948	5,869,948	0
2050	6,860,905	643,949	3,607,025	2,963,077	49,509,550	1,146,405	48,363,145	22,841	49,079,343	6,280,844	6,280,844	0
2051	7,117,520	668,594	3,742,643	3,074,050	47,340,429	1,176,610	46,163,819	23,401	46,545,165	6,720,503	6,720,503	0
2052	7,385,392	694,267	3,884,554	3,190,287	44,724,431	1,207,770	43,516,661	23,974	43,524,357	7,190,938	7,190,938	0
2053	7,666,536	721,404	4,033,601	3,312,198	41,616,770	1,239,843	40,376,927	24,564	39,968,968	7,694,304	7,694,304	0
2054	7,963,160	750,077	4,190,711	3,440,633	37,968,422	1,272,993	36,695,429	25,172	35,825,801	8,232,905	8,232,905	0
2055	8,272,394	779,790	4,354,616	3,574,826	33,727,023	1,307,464	32,419,559	25,796	31,035,324	8,809,208	8,809,208	0
2056	8,596,008	810,683	4,526,110	3,715,426	28,834,575	1,343,241	27,491,334	26,444	25,531,799	9,425,853	9,425,853	0
2057	8,931,382	842,403	4,703,740	3,861,338	23,226,292	1,380,741	21,845,551	27,115	19,242,474	10,085,663	10,085,663	0

^a Assumes sponsor selects Optional funding policy if contributions are lower.

^b Assumes employer makes contributions for the applicable valuation plan year in the following fiscal year.

^c Amount required to remain at 100% funded.

Actuarial Projections – Conservation Funding in 2037

Table A-7

Valuation Plan	Total Assets												Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Year End 30-Jun	Number		Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Premium Tax		Assets (eoy)				
		Active	Pay Status						Allocation Contribs.	Investment Income					
2017	41	58	\$16,966,940	\$1,843,155	\$24	\$629,465	\$174,158	\$428,814	\$1,387,931	\$17,744,129	\$46,089,126	\$28,344,997	38%		
2018	41	61	17,744,129	2,041,951	8,931	673,524	168,295	443,192	781,443	17,759,701	47,296,300	29,536,599	38%		
2019	41	62	17,759,701	2,156,194	9,418	720,671	178,903	463,895	781,337	17,738,895	48,467,391	30,728,496	37%		
2020	41	64	17,738,895	2,248,818	9,815	771,118	187,161	490,176	780,222	17,708,939	49,620,908	31,911,969	36%		
2021	41	63	17,708,939	2,320,495	10,249	825,096	198,872	506,465	779,093	17,687,721	50,800,273	33,112,552	35%		
2022	41	65	17,687,721	2,395,585	10,491	882,853	206,945	516,976	778,161	17,666,580	51,987,991	34,321,411	34%		
2023	41	65	17,666,580	2,494,636	10,916	944,653	216,142	533,126	776,935	17,631,884	53,157,292	35,525,408	33%		
2024	41	65	17,631,884	2,605,719	11,249	1,010,779	225,420	546,938	774,880	17,572,933	54,293,641	36,720,708	32%		
2025	41	66	17,572,933	2,700,173	11,610	1,081,534	238,457	561,719	772,311	17,515,171	55,436,728	37,921,557	32%		
2026	41	67	17,515,171	2,767,308	11,994	1,157,241	250,998	577,322	770,520	17,491,950	56,619,964	39,128,014	31%		
2027	41	67	17,491,950	2,845,472	12,383	1,238,248	263,218	593,522	770,162	17,499,245	57,829,734	40,330,489	30%		
2028	41	67	17,499,245	2,917,281	12,807	1,324,925	278,006	611,372	771,538	17,554,998	59,087,456	41,532,458	30%		
2029	41	68	17,554,998	2,987,875	13,172	1,417,670	290,445	627,682	775,171	17,664,919	60,384,054	42,719,135	29%		
2030	41	68	17,664,919	3,061,649	13,618	1,516,907	306,184	646,364	781,441	17,840,548	61,733,767	43,893,219	29%		
2031	41	68	17,840,548	3,116,218	14,010	1,623,090	321,370	663,682	791,207	18,109,669	63,160,819	45,051,150	29%		
2032	41	68	18,109,669	3,163,379	14,408	1,736,706	337,934	681,518	805,553	18,493,593	64,683,980	46,190,387	29%		
2033	41	68	18,493,593	3,208,757	14,785	1,858,275	353,420	699,493	825,261	19,006,500	66,305,859	47,299,359	29%		
2034	41	68	19,006,500	3,245,713	15,196	1,988,354	371,304	718,668	851,230	19,675,147	68,052,914	48,377,767	29%		
2035	41	68	19,675,147	3,295,848	15,568	2,127,539	388,590	737,884	884,104	20,501,848	69,914,400	49,412,552	29%		
2036	39	67	20,501,848	3,352,916	15,967	2,276,467	406,791	758,176	924,198	21,498,597	71,891,268	50,392,671	30%		
2037	36	67	21,498,597	3,402,573	16,016	2,299,084	404,104	778,463	968,840	22,530,499	73,901,032	51,370,533	30%		
2038	34	67	22,530,499	3,454,491	16,075	2,334,603	397,426	800,972	1,015,262	23,608,196	75,914,577	52,306,381	31%		
2039	32	67	23,608,196	3,500,876	16,139	2,365,018	389,428	824,075	1,063,737	24,733,439	77,912,827	53,179,388	32%		
2040	30	67	24,733,439	3,563,659	16,204	2,412,444	379,374	848,253	1,114,345	25,907,992	79,868,412	53,960,420	32%		
2041	28	67	25,907,992	3,623,372	16,268	2,455,421	369,437	873,726	1,167,171	27,134,107	81,784,409	54,650,302	33%		
2042	25	67	27,134,107	3,714,651	16,328	2,534,387	355,738	898,008	1,222,307	28,413,568	83,613,612	55,200,044	34%		
2043	23	67	28,413,568	3,821,712	16,383	2,628,455	338,753	925,747	1,279,831	29,748,259	85,316,884	55,568,625	35%		
2044	21	66	29,748,259	3,907,823	16,433	2,701,444	323,345	952,205	1,339,845	31,140,842	86,913,325	55,772,483	36%		
2045	19	66	31,140,842	3,998,586	16,477	2,779,124	307,604	978,834	1,402,462	32,593,803	88,391,604	55,797,801	37%		
2046	18	66	32,593,803	4,092,814	16,516	2,860,971	291,110	1,005,428	1,467,793	34,109,775	89,742,847	55,633,072	38%		
2047	16	66	34,109,775	4,190,519	16,551	2,946,347	273,949	1,032,465	1,535,957	35,691,423	90,951,282	55,259,859	39%		
2048	14	65	35,691,423	4,294,952	16,582	3,038,492	255,988	1,060,116	1,607,072	37,341,557	92,002,222	54,660,665	41%		
2049	13	65	37,341,557	4,404,747	16,611	3,136,520	236,988	1,088,124	1,681,266	39,063,097	92,880,457	53,817,360	42%		
2050	11	64	39,063,097	4,517,506	16,640	3,237,360	217,164	1,116,945	1,758,670	40,859,090	93,568,974	52,709,884	44%		
2051	10	64	40,859,090	4,634,167	16,670	3,342,124	196,542	1,146,405	1,839,421	42,732,745	94,052,584	51,319,839	45%		
2052	8	63	42,732,745	4,754,697	16,701	3,451,006	174,762	1,176,610	1,923,663	44,687,388	94,313,560	49,626,172	47%		
2053	7	63	44,687,388	4,877,461	16,736	3,562,003	151,982	1,207,770	2,011,546	46,726,492	94,333,812	47,607,320	50%		
2054	6	63	46,726,492	5,001,502	16,776	3,674,178	128,254	1,239,843	2,103,226	48,853,715	94,096,160	45,242,445	52%		
2055	4	62	48,853,715	5,128,342	16,820	3,787,024	105,396	1,272,993	2,198,868	51,072,834	93,580,190	42,507,356	55%		
2056	3	62	51,072,834	5,257,218	16,871	3,897,767	85,500	1,307,464	2,298,648	53,388,124	92,785,845	39,397,721	58%		
2057	3	61	53,388,124	5,379,348	16,926	3,998,302	68,231	1,343,241	2,402,766	55,804,390	91,741,346	35,936,956	61%		

Actuarial Projections – Conservation Funding in 2037

Table A-8

Plan Year End 30-Jun	Benefit Payment Account ^a						Accumulation Account ^b						Minimum Payment			Statewide Employer Contribution
	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	5.50% of Pay Employee Contribs.	100.00% of Premium Tax Allocation	Investment Income	Assets (boy) ^c	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Employee Contribs.	0.00% of Premium Tax Allocation	Investment Income	Conservation Employer Cont.	Alternative Employer Cont.	Minimum Alt /Cons Cont.	
2018	\$17,744,129	\$2,050,882	\$673,524	\$168,295	\$443,192	\$781,443	\$0	\$0	\$0	\$0	\$0	\$0	NA	\$673,524	\$673,524	\$0
2019	17,759,701	2,165,612	720,671	178,903	463,895	781,337	0	0	0	0	0	0	NA	720,671	720,671	0
2020	17,738,895	2,258,633	771,118	187,161	490,176	780,222	0	0	0	0	0	0	NA	771,118	771,118	0
2021	17,708,939	2,330,744	825,096	198,872	506,465	779,093	0	0	0	0	0	0	NA	825,096	825,096	0
2022	17,687,721	2,406,076	882,853	206,945	516,976	778,161	0	0	0	0	0	0	NA	882,853	882,853	0
2023	17,666,580	2,505,552	944,653	216,142	533,126	776,935	0	0	0	0	0	0	NA	944,653	944,653	0
2024	17,631,884	2,616,968	1,010,779	225,420	546,938	774,880	0	0	0	0	0	0	NA	1,010,779	1,010,779	0
2025	17,572,933	2,711,783	1,081,534	238,457	561,719	772,311	0	0	0	0	0	0	NA	1,081,534	1,081,534	0
2026	17,515,171	2,779,302	1,157,241	250,998	577,322	770,520	0	0	0	0	0	0	NA	1,157,241	1,157,241	0
2027	17,491,950	2,857,855	1,238,248	263,218	593,522	770,162	0	0	0	0	0	0	NA	1,238,248	1,238,248	0
2028	17,499,245	2,930,088	1,324,925	278,006	611,372	771,538	0	0	0	0	0	0	NA	1,324,925	1,324,925	0
2029	17,554,998	3,001,047	1,417,670	290,445	627,682	775,171	0	0	0	0	0	0	NA	1,417,670	1,417,670	0
2030	17,664,919	3,075,267	1,516,907	306,184	646,364	781,441	0	0	0	0	0	0	NA	1,516,907	1,516,907	0
2031	17,840,548	3,130,228	1,623,090	321,370	663,682	791,207	0	0	0	0	0	0	NA	1,623,090	1,623,090	0
2032	18,109,669	3,177,787	1,736,706	337,934	681,518	805,553	0	0	0	0	0	0	NA	1,736,706	1,736,706	0
2033	18,493,593	3,223,542	1,858,275	353,420	699,493	825,261	0	0	0	0	0	0	NA	1,858,275	1,858,275	0
2034	19,006,500	3,260,909	1,988,354	371,304	718,668	851,230	0	0	0	0	0	0	NA	1,988,354	1,988,354	0
2035	19,675,147	3,311,416	2,127,539	388,590	737,884	884,104	0	0	0	0	0	0	NA	2,127,539	2,127,539	0
2036	20,501,848	3,368,883	2,276,467	406,791	758,176	924,198	0	0	0	0	0	0	NA	2,276,467	2,276,467	0
2037	21,498,597	3,418,589	2,299,084	341,042	778,463	967,437	22,466,034	0	63,062	0	1,403	2,299,084	2,435,820	2,299,084	17,796	
2038	0	3,470,566	2,334,603	334,991	800,972	0	22,530,499	0	62,435	0	1,015,262	2,334,603	2,606,327	2,334,603	39,274	
2039	0	3,517,015	2,365,018	327,922	824,075	0	23,608,196	0	61,506	0	1,063,737	2,365,018	2,788,770	2,365,018	62,691	
2040	0	3,579,863	2,412,444	319,166	848,253	0	24,733,439	0	60,208	0	1,114,345	2,412,444	2,983,984	2,412,444	88,270	
2041	0	3,639,640	2,455,421	310,493	873,726	0	25,907,992	0	58,944	0	1,167,171	2,455,421	3,192,863	2,455,421	116,756	
2042	0	3,730,979	2,534,387	298,584	898,008	0	27,134,107	0	57,154	0	1,222,307	2,534,387	3,416,363	2,534,387	144,707	
2043	0	3,838,095	2,628,455	283,893	925,747	0	28,413,568	0	54,860	0	1,279,831	2,628,455	3,655,508	2,628,455	179,111	
2044	0	3,924,256	2,701,444	270,607	952,205	0	29,748,259	0	52,738	0	1,339,845	2,701,444	3,911,394	2,701,444	213,270	
2045	0	4,015,063	2,779,124	257,105	978,834	0	31,140,842	0	50,499	0	1,402,462	2,779,124	4,185,192	2,779,124	249,616	
2046	0	4,109,330	2,860,971	242,931	1,005,428	0	32,593,803	0	48,179	0	1,467,793	2,860,971	4,478,155	2,860,971	287,328	
2047	0	4,207,070	2,946,347	228,258	1,032,465	0	34,109,775	0	45,691	0	1,535,957	2,946,347	4,791,626	2,946,347	327,111	
2048	0	4,311,534	3,038,492	212,926	1,060,116	0	35,691,423	0	43,062	0	1,607,072	3,038,492	5,127,040	3,038,492	368,987	
2049	0	4,421,358	3,136,520	196,714	1,088,124	0	37,341,557	0	40,274	0	1,681,266	3,136,520	5,485,933	3,136,520	412,876	
2050	0	4,534,146	3,237,360	179,841	1,116,945	0	39,063,097	0	37,323	0	1,758,670	3,237,360	5,869,948	3,237,360	459,136	
2051	0	4,650,837	3,342,124	162,308	1,146,405	0	40,859,090	0	34,234	0	1,839,421	3,342,124	6,280,844	3,342,124	507,704	
2052	0	4,771,398	3,451,006	143,782	1,176,610	0	42,732,745	0	30,980	0	1,923,663	3,451,006	6,720,503	3,451,006	558,604	
2053	0	4,894,197	3,562,003	124,424	1,207,770	0	44,687,388	0	27,558	0	2,011,546	3,562,003	7,190,938	3,562,003	612,079	
2054	0	5,018,278	3,674,178	104,257	1,239,843	0	46,726,492	0	23,997	0	2,103,226	3,674,178	7,694,304	3,674,178	668,152	
2055	0	5,145,162	3,787,024	85,145	1,272,993	0	48,853,715	0	20,251	0	2,198,868	3,787,024	8,232,905	3,787,024	726,847	
2056	0	5,274,089	3,897,767	68,858	1,307,464	0	51,072,834	0	16,642	0	2,298,648	3,897,767	8,809,208	3,897,767	786,090	
2057	0	5,396,274	3,998,302	54,731	1,343,241	0	53,388,124	0	13,500	0	2,402,766	3,998,302	9,425,853	3,998,302	843,295	

^a Employer contributions paid from the City's General Fund are used to finance benefits not covered by the applicable employee contributions or premium tax allocation.

^b Assets accumulate in the Pension and Relief Fund.

^c Includes transfer from Benefit Payment Account to Accumulation Account in Plan Year End June 30, 2037.