

City Of South Charleston,
West Virginia
Policemen's Pension and
Relief Fund

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



September 24, 2018

Ms. Hannah Parsons
City Treasurer
238 Fourth Avenue
So. Charleston, WV 25303

Cpl. Daniel C. Johnson
Pension Board Secretary
City of South Charleston Policemen's Pension and Relief Fund

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

Dear Ms. Parsons and Cpl. Johnson:

Upon the request of the Municipal Pensions Oversight Board, we have performed an actuarial valuation as of July 1, 2017, for the City of South Charleston, West Virginia Policemen'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 4.00%. 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.



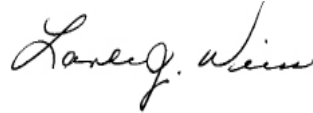
The signing actuaries are independent of the plan sponsor.

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 South Charleston, West Virginia Policemen'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	\$2,884,925
Actuarial Accrued Liability	\$28,472,232
Unfunded Actuarial Accrued Liability	\$25,587,307
Funded Ratio	10.13%

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	\$383,643
7% Increase in Alternative Contribution	\$26,855
FYE 06/30/2018 Alternative Contribution	\$410,498
Additional Contribution	\$0
Final FYE 06/30/2018 Alternative Contribution	\$410,498

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	\$410,498
7% Increase in Alternative Contribution	\$28,735
FYE 06/30/2019 Alternative Contribution	\$439,233
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	\$439,233
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	\$439,233

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. **However, given that the funded ratio as of June 30, 2017, is only 10%, and is projected to decline to 9% in 2021, we strongly recommend that the sponsor make additional contributions in excess of the statutory minimum.**

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 13% (using a testing interest rate of 5.50% for all plans using the Alternative funding policy), ratio of assets to benefits of 2.94, equity allocation of 58%, and 15-year projected funded ratio of 16%, resulted in a discount rate assumption of 4.00%.
- The Fund experienced an approximate annualized return of 5.60% on the market value of assets during the plan year ended June 30, 2017, which compares to the expected annualized return of 4.00%. The difference in actual versus expected return produced an asset (gain)/loss of (\$43,786).
- 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 (\$302,347) 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 4.00%:

- The funded ratio is projected to decrease from 10% at June 30, 2017, to 9% at June 30, 2021, and then increase slowly to 13% at 2037, and then increase to 34% at June 30, 2057.
- Employer contributions are expected to increase from \$410,498 (or 21% of pay) for the fiscal year end June 30, 2018, to \$5,744,851 (or 67% of pay) for fiscal year end June 30, 2057.

Please note that a funded ratio of only 10% at June 30, 2017, that declines in the future, means that the plan is severely 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 \$439,233 is sufficient to finance only 43% of the net employer normal cost of \$1,013,675. The state premium tax allocation of \$399,822 is sufficient to finance only 1.6% of the unfunded actuarial accrued liability of \$25,587,307.

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 a severely 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 4.00%, 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 4.00%, then the funded ratio will *decrease*. Conversely, if the actual return on assets is *greater* than the assumed return of 4.00% then the funded ratio will *increase*.
- If salaries *increase* by more than assumed, the funded ratio could *decrease*. If salaries *decrease* by more than assumed, the funded ratio could *increase*.
- If active members retire *sooner* than expected, the funded ratio will generally *decrease*. If active members retire *later* than expected, the funded ratio will generally *increase*.
- If active members become disabled during the year, the funded ratio could *decrease*.
- If retired members die *later* than expected, the funded ratio will *decrease*. If retired members die *sooner* than expected, the funded ratio will *increase*.

Executive Summary (Continued)

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

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	4.00%	4.00%
Cost-of-Living Adjustment	2.75%	2.75%
Wage Inflation	3.75%	3.75%
Expected Payroll	\$1,828,610	\$1,963,972
Average Pay	\$45,715	\$45,674
Expected Benefit Payments	\$922,475	\$980,104
1. Actuarial Accrued Liability	<u>No.</u>	<u>No.</u>
(a) Actives	40	43
(b) Retirees	14	15
(c) Survivors	8	8
(d) Disabled Members	12	12
(e) Deferred Vested Members	0	0
(f) Total	74	78
2. Present Value of Future Normal Costs	\$13,753,828	\$15,177,111
3. Present Value of Benefits (1(f) + 2)	\$41,264,562	\$43,649,343
4. Market Value of Assets	\$2,720,372	\$2,884,925
5. Unfunded Actuarial Accrued Liability (1(f) - 4)	\$24,790,362	\$25,587,307
6. Funded Ratio (4 / 1(f))	9.89%	10.13%
7. Net Employer Normal Cost		
(a) Normal Cost	\$1,091,419	\$1,163,436
(b) Administrative Expenses	\$7,954	\$7,360
(c) Gross Normal Cost (a + b)	\$1,099,373	\$1,170,796
(d) Employee Contribution Rate ^a	7.80%	8.00%
(e) Expected Employee Contributions	\$142,686	\$157,121
(f) Net Employer Normal Cost (c - e)	\$956,687	\$1,013,675
(% of Compensation)	52.32%	51.61%
	FYE 2018	FYE 2019
8. Estimated Minimum Employer Contribution ^b		
(a) Prior Year Alternative Contribution	\$383,643	\$410,498
(b) Increase in Alternative Contribution	7.00%	7.00%
(c) Current Year Alternative Contribution	\$410,498	\$439,233
(d) Additional Contribution	\$0	\$0
(e) Alternative Contribution (c + d)	\$410,498	\$439,233

^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.

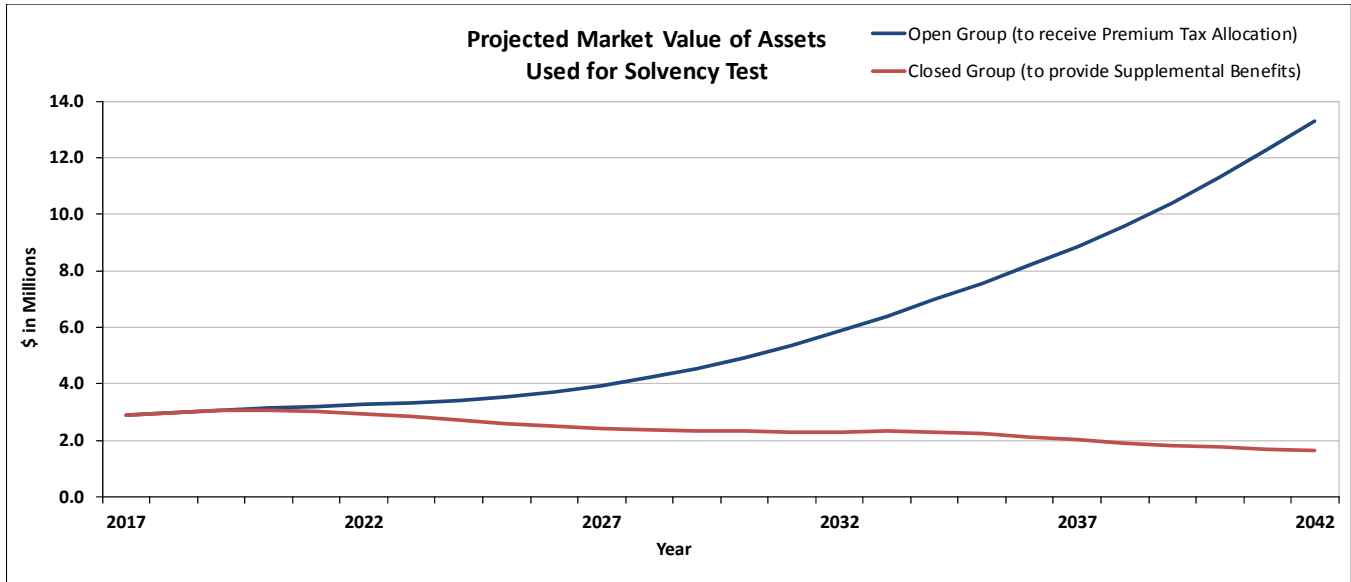
Schedule B: (Gain)/Loss Analysis

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

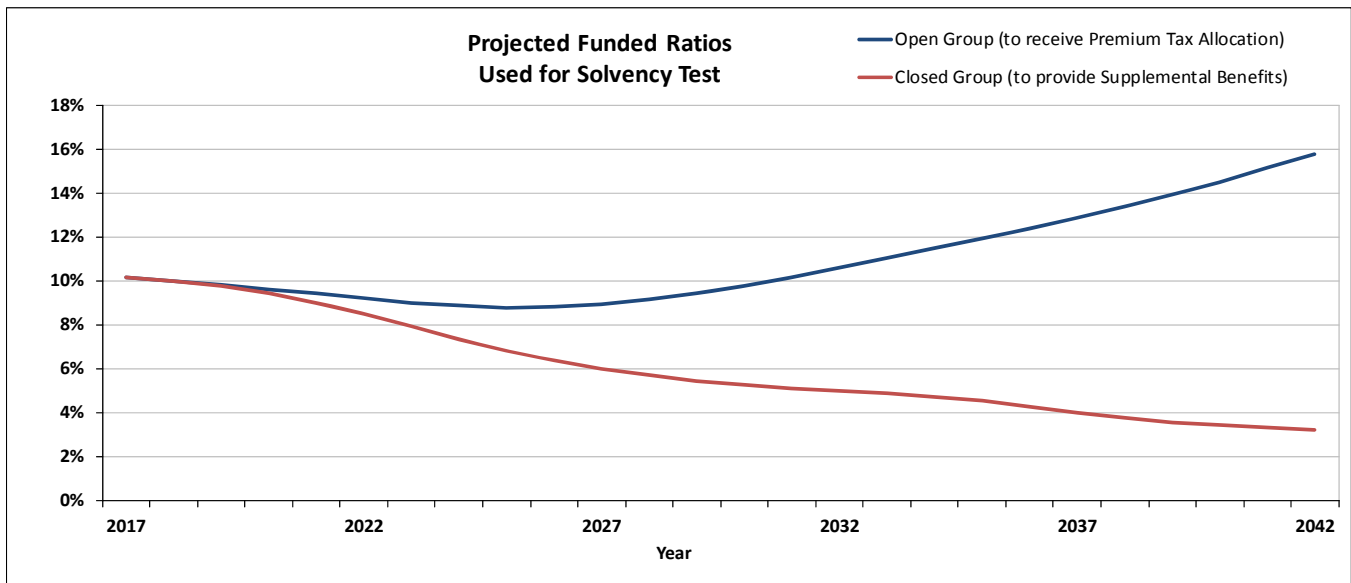
1. (a) Actuarial Accrued Liability as of 7/1/2016	\$27,510,734
(b) Normal Cost due 7/1/2016	\$1,091,419
(c) Interest on (a) and (b) to 6/30/2017	\$1,122,258
(d) Benefit Payments with interest to 6/30/2017	\$949,832
(e) Effect of Assumption Changes	\$0
(f) Expected Liability at 7/1/2017 [(a) + (b) + (c) - (d) + (e)]	\$28,774,579
(g) Actual Liability at 7/1/2017	\$28,472,232
(h) Liability (Gain)/Loss [(g) - (f)]	(\$302,347)
2. (a) Market Value of Assets as of 7/1/2016	\$2,748,447
(b) Interest on (a) to 6/30/2017	\$109,938
(c) Contributions with interest to 6/30/2017	\$932,586
(d) Benefit Payments with interest to 6/30/2017	\$949,832
(e) Expected Assets at 6/30/2017 [(a) + (b) + (c) - (d)]	\$2,841,139
(f) Actual Assets at 7/1/2017	\$2,884,925
(g) Asset (Gain)/Loss [(e) - (f)]	(\$43,786)
3. Total (Gain)/Loss [1(h) + 2(g)]	(\$346,133)

Graphs 1A and 1B: Solvency Projections

Graph 1A



Graph 1B



SECTION II

ACTUARIAL PROJECTIONS

ALTERNATIVE FUNDING POLICY

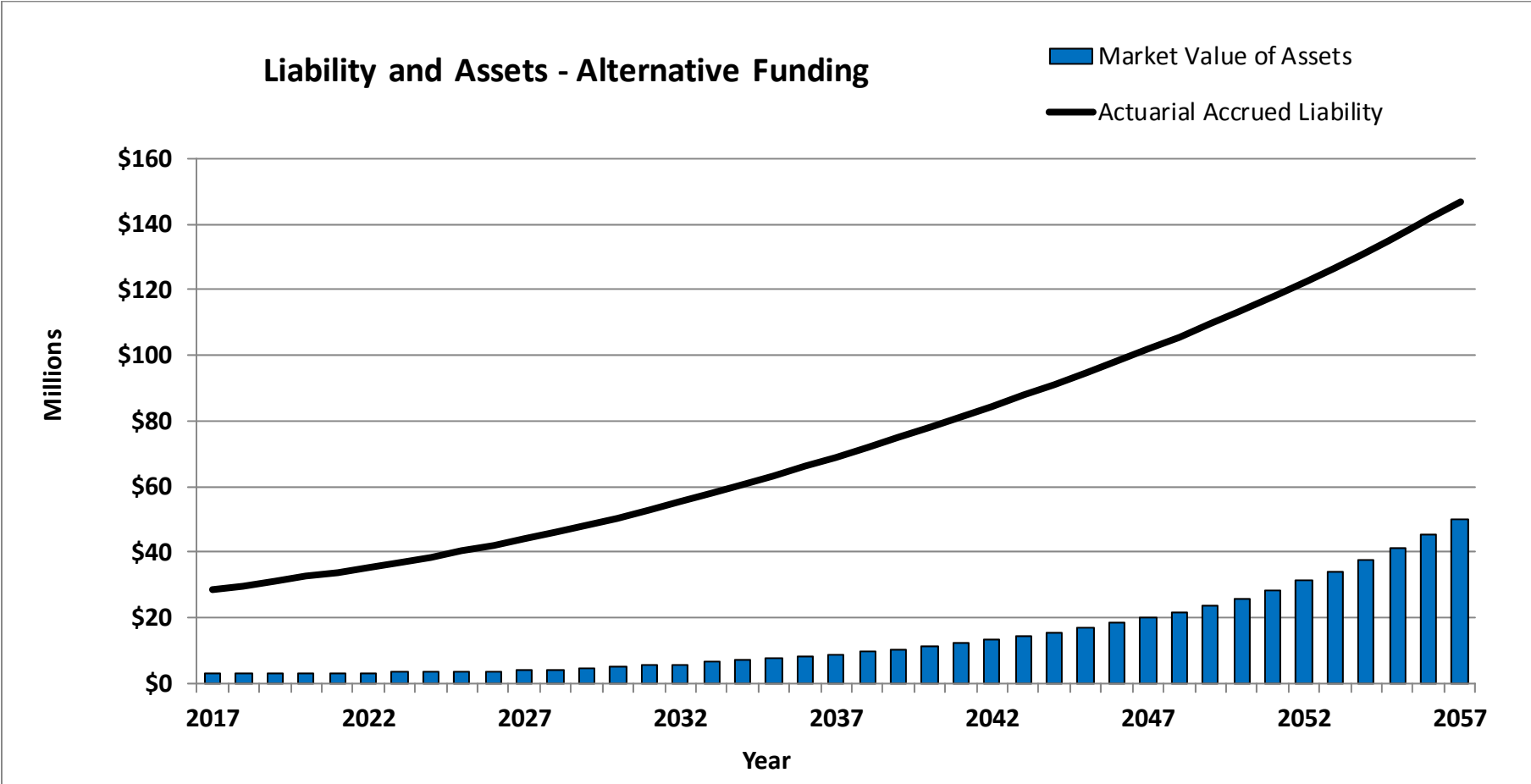
Alternative Funding on a Closed Group Basis, Table 1

Valuation Year End 30-Jun	Number		Total Payroll	Total Assets								Actuarial		
	Active	Status		Assets (boy)	Benefit Payments	Employer Contributions	Member Contributions	Premium Tax Allocation	Investment Income	Assets (eoy)	Accrued Liability	Unfunded Liability	Funded Ratio	
														Expenses
2017	43	35	\$1,828,610	\$2,748,447	\$931,208	\$2,738	\$383,643	\$145,280	\$385,377	\$156,124	\$2,884,925	\$28,472,232	\$25,587,307	10%
2018	40	35	1,963,972	2,884,925	980,104	7,360	410,498	157,121	389,524	114,797	2,969,401	29,798,133	26,828,732	10%
2019	37	37	1,936,280	2,969,401	1,034,089	7,348	439,233	155,463	399,822	117,847	3,040,329	31,102,787	28,062,458	10%
2020	34	38	1,883,724	3,040,329	1,096,693	7,360	469,979	151,853	371,211	119,415	3,048,733	32,361,170	29,312,437	9%
2021	32	39	1,843,120	3,048,733	1,156,832	7,396	502,878	149,090	363,542	119,004	3,019,020	33,582,583	30,563,563	9%
2022	29	40	1,790,174	3,019,020	1,225,084	7,444	538,079	145,507	354,874	116,918	2,941,870	34,747,868	31,805,998	8%
2023	27	41	1,754,382	2,941,870	1,279,965	7,502	575,745	143,188	347,687	113,301	2,834,324	35,878,447	33,044,123	8%
2024	26	41	1,736,763	2,834,324	1,322,548	7,567	616,047	142,190	343,050	108,841	2,714,337	36,997,305	34,282,968	7%
2025	25	41	1,735,177	2,714,337	1,355,924	7,636	659,170	142,369	340,093	104,178	2,596,588	38,123,787	35,527,199	7%
2026	23	41	1,744,265	2,596,588	1,381,754	7,708	705,312	143,370	338,391	99,856	2,494,055	39,272,629	36,778,574	6%
2027	23	41	1,764,341	2,494,055	1,400,489	7,785	754,684	145,204	337,676	96,382	2,419,727	40,458,993	38,039,266	6%
2028	21	41	1,769,879	2,419,727	1,424,715	7,867	807,512	146,099	338,267	94,003	2,373,026	41,668,855	39,295,829	6%
2029	20	42	1,744,036	2,373,026	1,469,055	7,959	864,038	144,870	337,090	92,327	2,334,337	42,861,381	40,527,044	5%
2030	19	42	1,724,560	2,334,337	1,512,119	8,057	924,521	144,130	334,740	91,061	2,308,613	44,040,898	41,732,285	5%
2031	17	43	1,696,123	2,308,613	1,561,316	8,154	989,237	142,415	334,418	90,297	2,295,510	45,196,645	42,901,135	5%
2032	16	43	1,668,384	2,295,510	1,611,732	8,253	1,058,484	140,626	332,858	90,077	2,297,570	46,327,285	44,029,715	5%
2033	15	43	1,635,954	2,297,570	1,670,485	8,353	1,132,578	138,814	333,704	90,442	2,314,270	47,422,935	45,108,665	5%
2034	13	44	1,527,073	2,314,270	1,781,860	8,452	1,211,858	131,484	333,427	90,323	2,291,051	48,383,053	46,092,002	5%
2035	12	45	1,403,220	2,291,051	1,900,702	8,554	1,296,688	122,967	330,603	88,493	2,220,546	49,185,003	46,964,457	5%
2036	10	46	1,287,330	2,220,546	2,004,963	8,655	1,387,456	114,390	330,091	85,224	2,124,089	49,842,971	47,718,882	4%
2037	9	46	1,170,329	2,124,089	2,105,676	8,759	1,484,578	105,505	328,906	81,093	2,009,736	50,354,804	48,345,068	4%
2038	8	46	1,083,794	2,009,736	2,185,569	8,870	1,588,498	99,030	329,874	76,884	1,909,583	50,753,865	48,844,282	4%
2039	6	47	981,685	1,909,583	2,275,037	8,980	1,699,693	90,473	331,442	73,167	1,820,341	51,016,663	49,196,322	4%
2040	5	47	877,086	1,820,341	2,362,563	9,089	1,818,672	81,354	332,692	70,062	1,751,469	51,138,691	49,387,222	3%
2041	4	47	751,662	1,751,469	2,466,145	9,197	1,945,979	70,048	335,070	67,598	1,694,821	51,087,268	49,392,447	3%
2042	3	48	588,556	1,694,821	2,595,547	9,305	2,082,198	54,986	336,817	65,202	1,629,172	50,808,669	49,179,497	3%
2043	2	48	454,108	1,629,172	2,693,825	9,412	2,227,952	42,541	338,851	63,307	1,598,586	50,342,062	48,743,476	3%
2044	2	47	350,823	1,598,586	2,764,080	9,519	2,383,909	33,016	342,110	63,655	1,647,678	49,726,985	48,079,307	3%
2045	1	47	273,825	1,647,678	2,811,315	9,623	2,550,783	25,877	345,873	67,919	1,817,192	48,995,959	47,178,767	4%
2046	1	47	211,705	1,817,192	2,845,978	9,726	2,729,338	20,048	350,477	77,523	2,138,874	48,165,927	46,027,053	4%
2047	1	46	148,978	2,138,874	2,880,314	9,825	2,920,392	14,135	355,332	93,471	2,632,065	47,234,145	44,602,080	6%
2048	0	45	101,202	2,632,065	2,898,563	9,920	3,124,819	9,614	360,438	116,895	3,335,348	46,221,221	42,885,873	7%
2049	0	45	69,087	3,335,348	2,900,405	10,010	3,343,556	6,563	365,546	149,361	4,289,960	45,148,668	40,858,708	10%
2050	0	44	46,287	4,289,960	2,892,818	10,093	3,577,605	4,397	370,647	192,388	5,532,086	44,028,736	38,496,650	13%
2051	0	43	29,733	5,532,086	2,878,082	10,168	3,828,037	2,825	375,655	247,391	7,097,743	42,870,243	35,772,500	17%
2052	0	42	17,007	7,097,743	2,857,889	10,233	4,096,000	1,616	380,362	315,791	9,023,389	41,679,222	32,655,833	22%
2053	0	41	9,623	9,023,389	2,831,293	10,288	4,382,720	914	384,759	399,094	11,349,295	40,463,803	29,114,508	28%
2054	0	40	5,632	11,349,295	2,799,782	10,330	4,689,510	535	388,744	498,901	14,116,873	39,229,902	25,113,029	36%
2055	0	39	3,376	14,116,873	2,764,535	10,359	5,017,776	321	392,273	616,867	17,369,216	37,981,457	20,612,241	46%
2056	0	38	1,876	17,369,216	2,726,269	10,373	5,369,020	178	395,264	754,732	21,151,767	36,721,369	15,569,602	58%
2057	0	37	520	21,151,767	2,685,433	10,373	5,744,851	49	397,639	914,329	25,512,830	35,451,859	9,939,029	72%

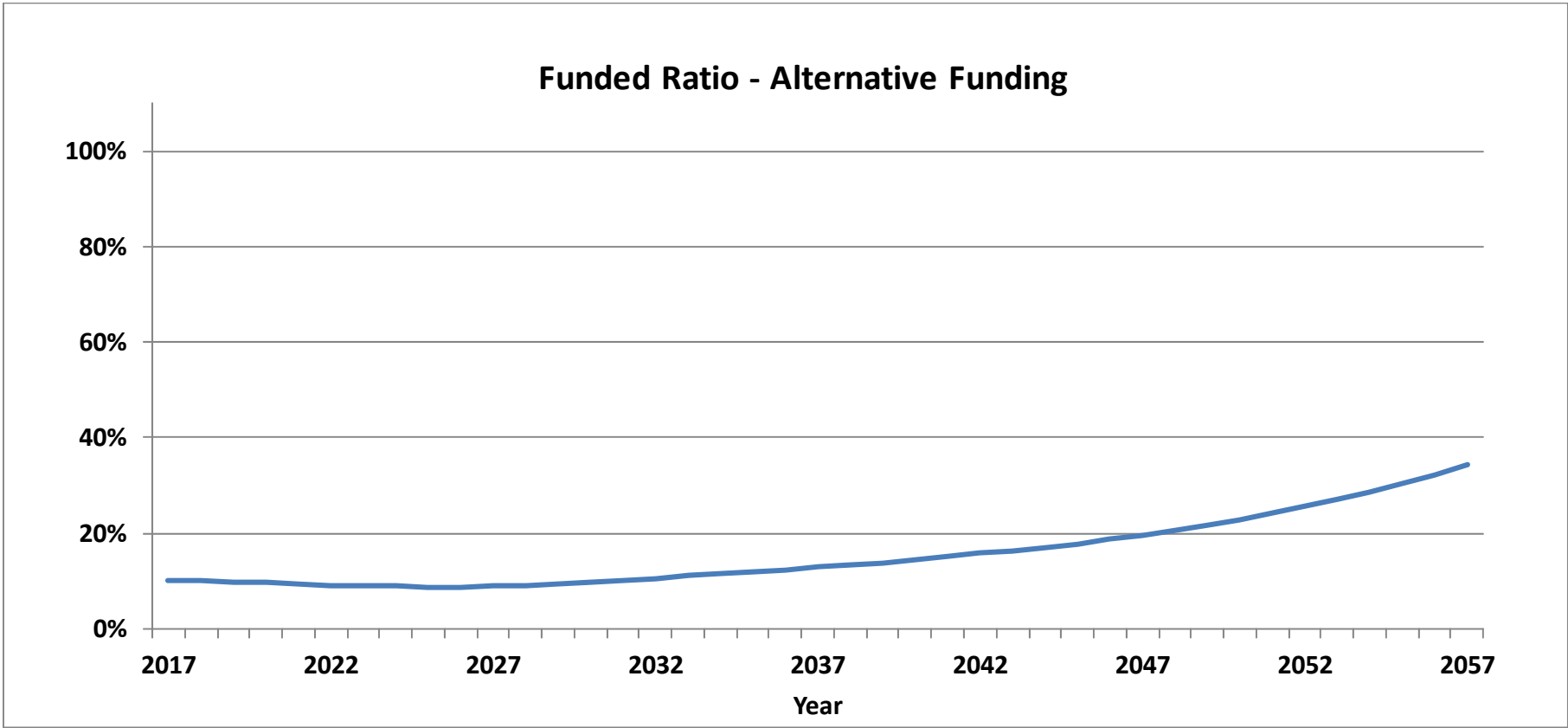
Alternative Funding on an Open Group Basis, Table 2

Valuation Plan Year End	Number		Total Assets										Actuarial Accrued Liability	Unfunded Liability	Funded Ratio			
	Active	Pay Status	Total Payroll	Assets			Benefit		Employer		Member					Premium Tax	Investment	Assets
				Payments	Expenses	Contributions	Contributions	Contributions	Contributions	Allocation	Income	(eoy)						
2017	43	35	\$1,828,610	\$2,748,447	\$931,208	\$2,738	\$383,643	\$145,280	\$385,377	\$156,124	\$2,884,925	\$28,472,232	\$25,587,307	10%				
2018	43	35	1,963,972	2,884,925	980,104	7,360	410,498	157,121	389,524	114,797	2,969,401	29,798,133	26,828,732	10%				
2019	43	37	2,025,750	2,969,401	1,034,089	7,600	439,233	164,621	399,822	118,023	3,049,411	31,155,170	28,105,759	10%				
2020	43	38	2,119,082	3,049,411	1,097,027	7,988	469,979	175,353	417,208	121,135	3,128,071	32,552,919	29,424,848	10%				
2021	43	39	2,195,945	3,128,071	1,158,331	8,284	502,878	183,603	427,879	124,088	3,199,903	33,986,806	30,786,903	9%				
2022	43	40	2,281,178	3,199,903	1,228,479	8,642	538,079	193,338	440,281	126,700	3,261,180	35,452,386	32,191,206	9%				
2023	43	41	2,383,303	3,261,180	1,285,732	8,991	575,745	204,245	452,560	129,216	3,328,223	36,974,085	33,645,862	9%				
2024	43	41	2,494,933	3,328,223	1,331,143	9,308	616,047	215,622	464,318	132,249	3,416,007	38,573,081	35,157,074	9%				
2025	43	41	2,615,904	3,416,007	1,367,758	9,603	659,170	227,580	475,491	136,340	3,537,228	40,268,024	36,730,796	9%				
2026	43	41	2,743,540	3,537,228	1,397,228	9,882	705,312	240,019	486,272	141,975	3,703,695	42,074,459	38,370,764	9%				
2027	43	41	2,881,854	3,703,695	1,420,030	10,158	754,684	253,291	497,244	149,634	3,928,360	44,010,534	40,082,174	9%				
2028	43	42	3,002,106	3,928,360	1,448,771	10,421	807,512	265,262	508,197	159,546	4,209,686	46,063,536	41,853,850	9%				
2029	43	42	3,117,751	4,209,686	1,498,006	10,756	864,038	277,915	521,602	171,453	4,535,932	48,211,852	43,675,920	9%				
2030	43	42	3,261,296	4,535,932	1,546,300	11,135	924,521	293,136	536,185	185,327	4,917,666	50,476,704	45,559,038	10%				
2031	43	43	3,386,079	4,917,666	1,601,119	11,470	989,237	306,258	549,670	201,313	5,351,554	52,846,472	47,494,918	10%				
2032	43	43	3,541,162	5,351,554	1,657,520	11,871	1,058,484	322,430	565,506	219,549	5,848,132	55,341,980	49,493,848	11%				
2033	43	44	3,674,582	5,848,132	1,722,700	12,210	1,132,578	336,684	580,030	240,152	6,402,666	57,948,823	51,546,157	11%				
2034	43	45	3,763,066	6,402,666	1,841,119	12,616	1,211,858	348,771	596,801	262,121	6,968,481	60,590,032	53,621,551	12%				
2035	43	46	3,900,275	6,968,481	1,967,866	13,160	1,296,688	366,024	619,144	284,696	7,554,008	63,286,291	55,732,283	12%				
2036	43	47	4,026,326	7,554,008	2,081,104	13,619	1,387,456	380,840	638,995	308,350	8,174,926	66,047,882	57,872,956	12%				
2037	43	47	4,182,670	8,174,926	2,192,084	14,142	1,484,578	397,860	661,166	333,679	8,845,983	68,898,289	60,052,306	13%				
2038	43	48	4,350,156	8,845,983	2,283,566	14,619	1,588,498	414,243	682,748	361,510	9,594,797	71,864,951	62,270,154	13%				
2039	43	49	4,494,190	9,594,797	2,388,119	15,108	1,699,693	428,248	704,907	392,300	10,416,717	74,917,645	64,500,928	14%				
2040	43	49	4,665,190	10,416,717	2,500,709	15,685	1,818,672	445,034	730,532	426,132	11,320,692	78,066,641	66,745,949	15%				
2041	43	50	4,800,763	11,320,692	2,639,818	16,231	1,945,979	457,811	755,312	462,790	12,286,535	81,271,685	68,985,150	15%				
2042	43	51	4,942,352	12,286,535	2,812,486	16,893	2,082,198	471,192	784,515	501,532	13,296,593	84,503,673	71,207,080	16%				
2043	43	52	5,112,596	13,296,593	2,963,531	17,559	2,227,952	486,486	813,918	542,701	14,386,559	87,799,233	73,412,674	16%				
2044	43	53	5,293,545	14,386,559	3,098,732	18,203	2,383,909	502,121	842,927	587,583	15,586,164	91,179,573	75,593,409	17%				
2045	43	54	5,489,256	15,586,164	3,226,935	18,860	2,550,783	518,970	872,315	637,235	16,919,672	94,659,487	77,739,815	18%				
2046	43	55	5,679,666	16,919,672	3,362,964	19,515	2,729,338	535,909	901,865	692,325	18,396,631	98,231,373	79,834,742	19%				
2047	43	55	5,876,200	18,396,631	3,520,488	20,209	2,920,392	554,064	933,092	753,033	20,016,515	101,889,080	81,872,565	20%				
2048	43	56	6,089,263	20,016,515	3,677,496	20,914	3,124,819	573,745	965,083	819,776	21,801,529	105,652,117	83,850,588	21%				
2049	43	56	6,314,651	21,801,529	3,827,965	21,619	3,343,556	595,053	997,292	893,575	23,781,421	109,538,103	85,756,682	22%				
2050	43	57	6,556,334	23,781,421	3,978,387	22,337	3,577,605	618,195	1,030,277	975,524	25,982,298	113,564,510	87,582,212	23%				
2051	43	57	6,809,392	25,982,298	4,127,881	23,055	3,828,037	642,597	1,063,510	1,066,685	28,432,192	117,747,487	89,315,295	24%				
2052	43	58	7,078,961	28,432,192	4,275,049	23,785	4,096,000	668,547	1,097,514	1,168,246	31,163,664	122,104,751	90,941,087	26%				
2053	43	58	7,361,032	31,163,664	4,419,257	24,516	4,382,720	694,826	1,131,797	1,281,512	34,210,747	126,653,855	92,443,108	27%				
2054	43	58	7,650,511	34,210,747	4,561,493	25,258	4,689,510	721,708	1,166,805	1,407,864	37,609,884	131,403,001	93,793,117	29%				
2055	43	58	7,951,037	37,609,884	4,708,019	26,025	5,017,776	749,678	1,203,224	1,548,689	41,395,207	136,357,949	94,962,742	30%				
2056	43	59	8,259,241	41,395,207	4,863,327	26,809	5,369,020	778,602	1,240,665	1,705,281	45,598,638	141,523,085	95,924,447	32%				
2057	43	59	8,581,752	45,598,638	5,027,124	27,619	5,744,851	809,127	1,279,498	1,878,975	50,256,346	146,906,991	96,650,645	34%				

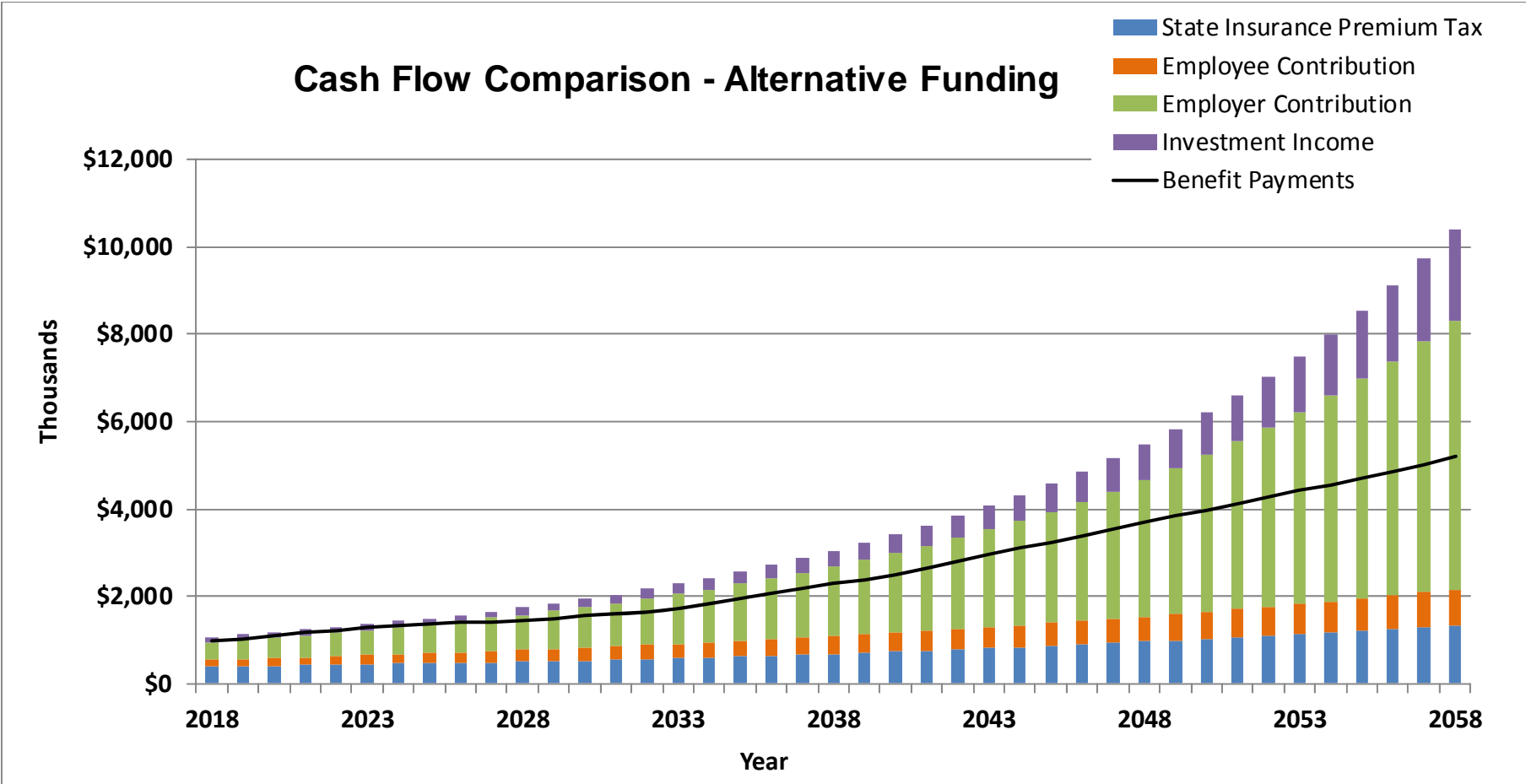
Open Group Actuarial Projections – Alternative Funding, Graph 2



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 in excess of 1.5% of pay, 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.

Given that the funded ratio as of June 30, 2017 is only 10.1% and that the ratio of assets to expected benefits for the year is only 2.94, we strongly recommend that the sponsor make additional contributions in excess of the statutory minimum under both the Alternative and Conservation funding policies.

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	\$439,233	21.7%	NA	NA
Optional	\$2,006,841	103.6%	\$9,394	10.5%
Conservation	\$784,514	40.5%	\$9,394	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 \$410,498 in fiscal year end 2018 to \$5,744,851 in fiscal year end 2057. In fiscal year end 2057, the plan is projected to be 34% 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 \$439,233 to \$2,006,841. However, over the 40-year projection period, total employer contributions to both the local plan and the statewide plan are projected to decrease from \$2,016,235 in fiscal year end 2019 to \$1,050,419 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 \$439,233 to \$784,514. During the 35-year projection period, total employer contributions to both the local plan and the statewide plan are projected to increase from \$793,908 in fiscal year end 2019 to \$3,250,599 in fiscal year end 2051 and the Plan is projected to be fully funded in 2052.

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 and 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

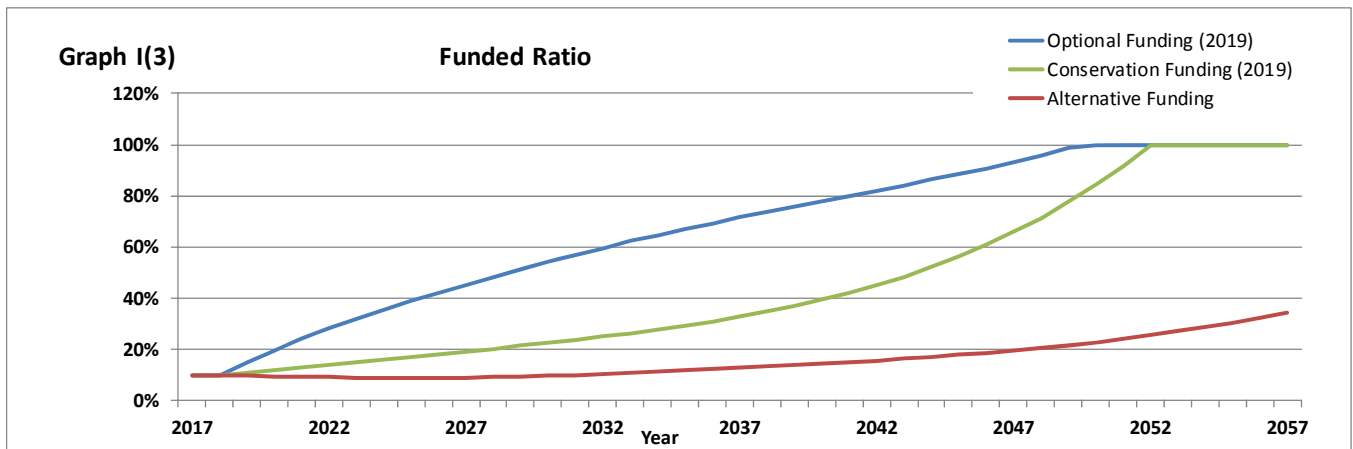
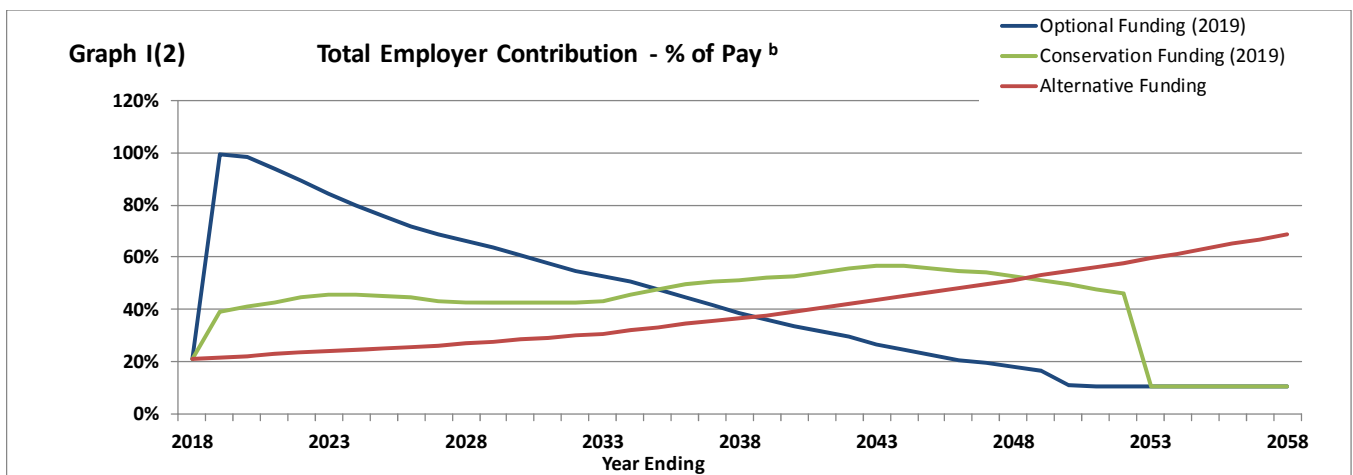
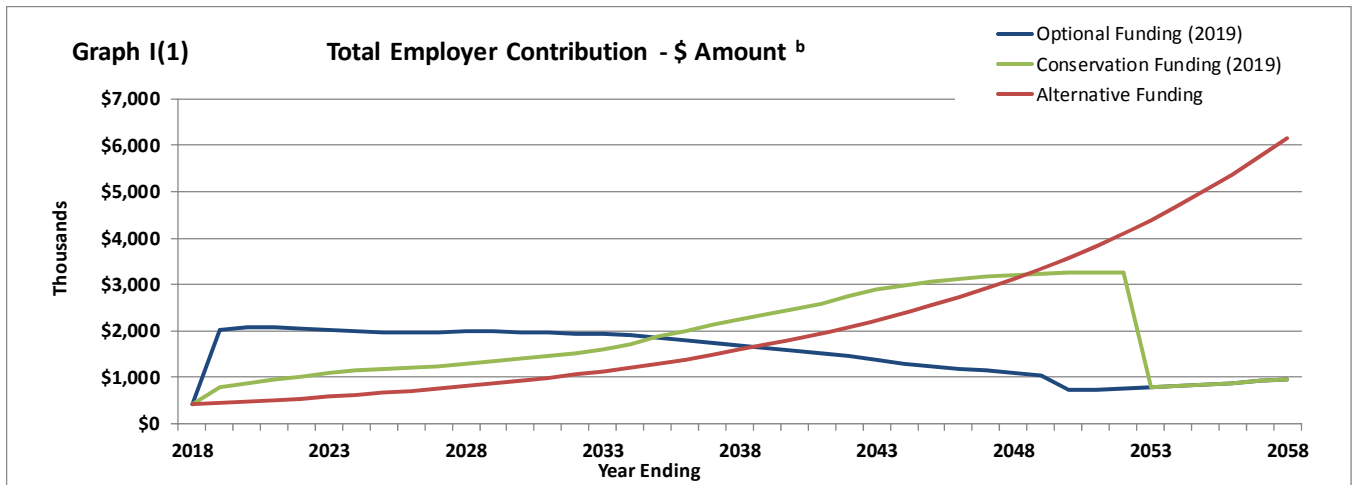
Under Scenario II, the plan sponsor is assumed to make contributions under the Alternative funding policy in future years, until the first year that either the Optional or Conservation policy produces a lower contribution. Under this assumption, the employer contributions under the Optional funding policy are not projected to be lower than contributions under the Alternative funding policy. In plan year end 2040, the employer contributions under the Conservation funding policy of \$1,776,231 are projected to be lower than contributions under the Alternative funding policy of \$1,818,672.

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 2040. After 2040, the funded ratio under the Conservation funding policy increases at a slightly 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

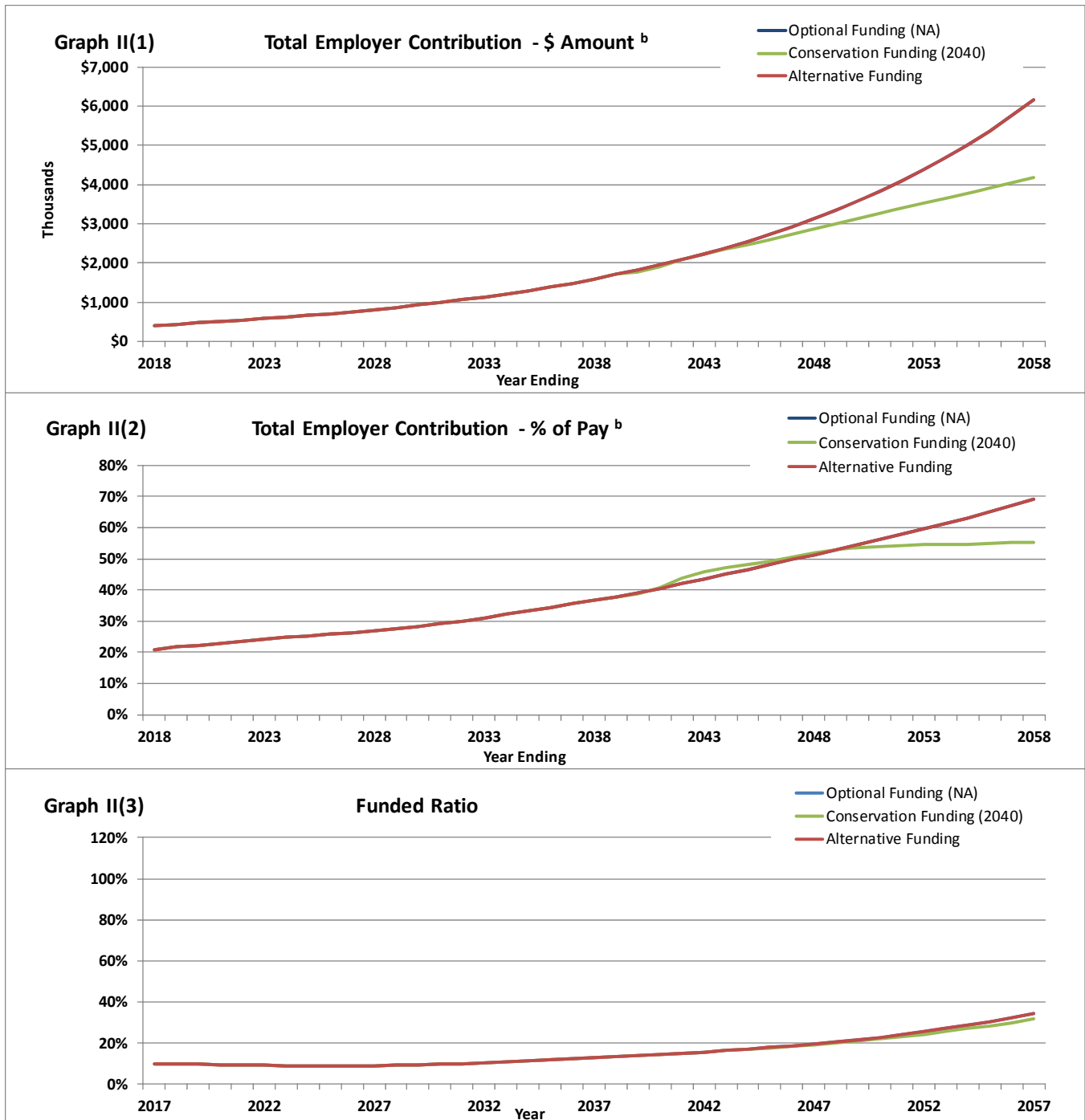


^a Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.

^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

Valuation Date	July 1, 2016	July 1, 2017
Valuation Interest Rate	4.00%	4.00%
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		
Actuarial Valuation Date	July 1, 2016	July 1, 2017
1. Market Value of Assets	\$2,720,372	\$2,884,925
2. Actuarial Accrued Liability	\$27,510,734	\$28,472,232
3. Unfunded Actuarial Accrued Liability (2 - 1)	\$24,790,362	\$25,587,307
4. Funded Ratio (1/2)	10%	10%
5. Expected Payroll	\$1,828,610	\$1,963,972
6. UAAL as Percentage of Covered Payroll (3/5)	1,356%	1,303%
Schedule of Employer Contributions ^c		
	FYE 2017	FYE 2018
1. Actuarially Determined Contribution		
(a) Employer Normal Cost	\$956,687	\$1,013,675
(b) Amortization of Unfunded Actuarial Accrued Liability	\$1,061,773	\$1,142,192
(c) Actuarially Determined Contribution (ADC) (a + b)	\$2,018,460	\$2,155,867
2. Employer Contribution ^b	\$383,643	\$410,498
3. Premium Tax Allocation	\$385,377	\$389,524
4. Percentage of ADC Contributed [(2 + 3)/1(c)]	38%	37%

^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 End of Prior Year	\$2,730,353	\$2,720,372
Adjustment to Market Value of Assets at Beginning of Year	\$0	\$28,075
Market Value of Assets Beginning of Year	\$2,730,353	\$2,748,447
1. Revenue During Fiscal Year		
(a) Employee Contribution	\$143,722	\$145,280
(b) Governmental Contribution		
(i) From Local Government	\$358,545	\$383,643
(ii) From State Government	\$424,873	\$385,377
(iii) Reallocation from State Government	\$0	\$0
(iv) Total	\$783,418	\$769,020
(c) Earnings on Investments		
(i) Net Appreciation/(Depreciation)	(\$16,100)	\$119,310
(ii) Bond Interest	\$0	\$9,423
(iii) Dividends	\$12,138	\$34,359
(iv) Net Realized Gain (Loss) on Sale/Exchange	(\$30,263)	(\$6,968)
(v) Other	\$13,133	\$0
(vi) Less Investment Expense	\$0	\$0
(vii) Total	(\$21,092)	\$156,124
(d) Other Revenue	\$2,294	\$0
(e) Receivable Investment Income/(Expense)	\$0	\$0
(f) Receivable Contribution ^a		
(i) From Employee Contributions	\$0	\$0
(ii) From Local Government	\$0	\$0
(iii) From State Government	\$0	\$0
(iv) Total	\$0	\$0
(g) Total Revenue (sum of (a) through (f))	\$908,342	\$1,070,424
2. Expenditures During Fiscal Year		
(a) Benefits Paid	\$908,898	\$916,364
(b) Withdrawals	\$0	\$14,844
(c) Administrative Expenses	\$9,425	\$2,738
(d) Payable Benefits and Withdrawals	\$0	\$0
(e) Payable Administrative Expenses	\$0	\$0
(f) Total Expenditures (sum of (a) through (e))	\$918,323	\$933,946
B. Market Value of Assets End of Year		
[A + 1(g) - 2(f)]	\$2,720,372	\$2,884,925
C. Approximate Return on Assets	(1.03)%	5.60%

^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	\$1,686,313	62%	\$296,184	10%
2. Government Securities				
(a) US Treasury Bills, Notes and Bonds	\$0		\$74,311	
(b) US State and Local Governmental Debt Securities	\$0		\$0	
(c) Foreign Governmental Debt Securities	\$0		\$0	
(d) Other	\$0		\$0	
(e) Total Government Securities (sum of (a) through (d))	\$0	0%	\$74,311	3%
3. Corporate Fixed Income				
(a) US Bonds	\$0		\$19,802	
(b) US Mortgage or other Asset Backed Securities	\$0		\$21,691	
(c) US Mutual Fund Shares (Bonds)	\$581,874		\$763,258	
(d) US Exchange Traded Funds (Bonds)	\$0		\$24,640	
(e) International Bonds	\$0		\$0	
(f) International Mutual Fund Shares (Bonds)	\$402,964		\$0	
(g) International Exchange Traded Funds (Bonds)	\$0		\$0	
(h) Total Corporate Fixed Income (sum of (a) through (g))	\$984,838	36%	\$829,391	29%
4. Corporate Equity				
(a) US Equity	\$0		\$780,741	
(b) US Mutual Fund Shares (Equity)	\$0		\$123,431	
(c) US Exchange Traded Funds (Equity)	\$0		\$357,841	
(d) International Equity	\$0		\$0	
(e) International Mutual Fund Shares (Equity)	\$0		\$0	
(f) International Exchange Traded Funds (Equity)	\$0		\$423,026	
(g) Total Corporate Equity (sum of (a) through (f))	\$0	0%	\$1,685,039	58%
5. Alternative Investments				
(a) Real Estate Investment Trust	\$15,762		\$0	
(b) Private Equity Fund	\$0		\$0	
(c) Hedge Funds	\$0		\$0	
(d) Other Alternative Investments	\$33,459		\$0	
(e) Total Alternative Investments (sum of (a) through (d))	\$49,221	2%	\$0	0%
6. Other	\$0	0%	\$0	0%
7. Receivable Contributions				
(a) From Employee Contributions	\$0		\$0	
(b) From Local Government	\$0		\$0	
(c) From State Government	\$0		\$0	
(d) Total Receivable Contributions (sum of (a) through (c))	\$0	0%	\$0	0%
8. Accruals				
(a) Receivable (other than State and Local Contributions)	\$0		\$0	
(b) Less Payable	\$0		\$0	
(c) Total	\$0	0%	\$0	0%
Market Value of Assets End of Year	\$2,720,372		\$2,884,925	
[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:	40	14	12	0	8	74
New Actives:	6					6
Returned to Actives Status:						0
Data Corrections/Other Changes:						0
Vested Terminations:						0
Non-Vested Terminations:	(1)					(1)
Disabled:	(1)		1			0
Retirements:	(1)	1				0
Deaths with Beneficiary:						0
Deaths w/o Beneficiary:			(1)			(1)
Expired Annuity or Stop Payment:						0
Net Changes:	3	1	0	0	0	4
Total Participants June 30, 2017:	43	15	12	0	8	78

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	4									4	\$ 140,000
25-29	2	8	2							12	\$ 462,507
30-34		1	8	2						11	\$ 510,365
35-39		1	4	1						6	\$ 275,871
40-44			1							1	\$ 54,712
45-49				1	1	3	2			7	\$ 400,563
50-54					1					1	\$ 53,126
55-59						1				1	\$ 52,572
60-64											\$ 0
65-69											\$ 0
Over 70											\$ 0
Totals	6	10	15	4	2	4	2	0	0	43	\$ 1,949,715
Averages _____											
Age: 34.5 years											
Service: 8.2 years											
Annual Pay: \$45,342 ^a											

^a Based 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	40	43
Total Annual Pay	\$1,827,376	\$1,949,715
Average Age	35.8	34.5
Average Service	9.2	8.2

Inactive Participants	July 1, 2016		July 1, 2017	
Type	No.	Annual Benefit	No.	Annual Benefit
Retirees	14	\$481,766	15	\$526,072
Survivors	8	\$138,600	8	\$138,600
Disabled Members	12	\$265,042	12	\$283,020
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	\$2,884,925
Liabilities using a 5.50% discount rate	\$22,715,095
Funded Ratio	13%
Expected Benefit Payments	\$980,104
Liquidity Ratio	2.94
Equity Exposure	58%
Projected Funded Ratio after 15 years	16%

Discount Rate ^a	4.00%
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^a Recommended discount rate of 4.00% due to low funded ratio as of July 1, 2017 and a projected decrease in funded ratio.

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 South Charleston Policemen’s Pension and Relief Fund reported 41 eligible active members and 36 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 \$399,822 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																		
<p><i>Amortization Policies:</i></p> <p>Alternative Plans and former Alternative Plans that selected the Conservation Policy</p> <p>Standard Plans and former Standard Plans that selected the Optional Policy</p> <p>Former Alternative Plans that selected the Optional Policy</p>	<p>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).</p> <p>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)</p> <p>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)</p>																		

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	The sponsor did not appear to provide separate investment and administrative expenses. Administrative expenses used are equal to 0.25% of expected pay plus 0.25% of expected benefits. 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	None
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 Police Department are eligible to participate in the Policemen'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	
	Pay Active	Status	Assets (bo)	Benefit Payments	Expenses	Employer Contribs.	Member Contribs.	Premium Tax					Assets (eoy)
								Allocation Contribs.	Investment Income				
2017	43	35	\$2,748,447	\$931,208	\$2,738	\$383,643	\$145,280	\$385,377	\$156,124	\$2,884,925	\$28,472,232	\$25,587,307	10%
2018	40	35	2,884,925	980,104	7,360	410,498	157,121	389,524	114,797	2,969,401	29,798,133	26,828,732	10%
2019	37	37	2,969,401	1,034,089	7,348	2,006,841	155,463	399,822	148,892	4,638,982	31,102,787	26,463,805	15%
2020	34	38	4,638,982	1,096,693	7,360	2,062,851	151,853	417,208	215,817	6,382,657	32,361,170	25,978,513	20%
2021	32	39	6,382,657	1,156,832	7,396	2,026,301	149,090	427,879	283,805	8,105,505	33,582,583	25,477,078	24%
2022	29	40	8,105,505	1,225,084	7,444	1,989,418	145,507	440,281	350,811	9,798,994	34,747,868	24,948,874	28%
2023	27	41	9,798,994	1,279,965	7,502	1,944,837	143,188	452,560	416,776	11,468,888	35,878,447	24,409,559	32%
2024	26	41	11,468,888	1,322,548	7,567	1,908,454	142,190	464,318	482,220	13,135,955	36,997,305	23,861,350	36%
2025	25	41	13,135,955	1,355,924	7,636	1,883,662	142,369	475,491	547,974	14,821,892	38,123,787	23,301,895	39%
2026	23	41	14,821,892	1,381,754	7,708	1,868,907	143,370	486,272	614,839	16,545,818	39,272,629	22,726,811	42%
2027	23	41	16,545,818	1,400,489	7,785	1,860,286	145,204	497,244	683,508	18,323,786	40,458,993	22,135,207	45%
2028	21	41	18,323,786	1,424,715	7,867	1,858,148	146,099	508,197	754,337	20,157,985	41,668,855	21,510,870	48%
2029	20	42	20,157,985	1,469,055	7,959	1,845,321	144,870	521,602	826,812	22,019,577	42,861,381	20,841,804	51%
2030	19	42	22,019,577	1,512,119	8,057	1,811,984	144,130	536,185	900,035	23,891,736	44,040,898	20,149,162	54%
2031	17	43	23,891,736	1,561,316	8,154	1,781,551	142,415	549,670	973,575	25,769,477	45,196,645	19,427,168	57%
2032	16	43	25,769,477	1,611,732	8,253	1,745,759	140,626	565,506	1,047,254	27,648,637	46,327,285	18,678,648	60%
2033	15	43	27,648,637	1,670,485	8,353	1,712,204	138,814	580,030	1,120,842	29,521,689	47,422,935	17,901,246	62%
2034	13	44	29,521,689	1,781,860	8,452	1,675,679	131,484	596,801	1,193,020	31,328,362	48,383,053	17,054,691	65%
2035	12	45	31,328,362	1,900,702	8,554	1,594,746	122,967	619,144	1,261,603	33,017,565	49,185,003	16,167,438	67%
2036	10	46	33,017,565	2,004,963	8,655	1,504,501	114,390	638,995	1,325,540	34,587,373	49,842,971	15,255,598	69%
2037	9	46	34,587,373	2,105,676	8,759	1,416,065	105,505	661,166	1,384,848	36,040,522	50,354,804	14,314,282	72%
2038	8	46	36,040,522	2,185,569	8,870	1,328,663	99,030	682,748	1,439,957	37,396,481	50,753,865	13,357,384	74%
2039	6	47	37,396,481	2,275,037	8,980	1,255,490	90,473	704,907	1,491,242	38,654,576	51,016,663	12,362,087	76%
2040	5	47	38,654,576	2,362,563	9,089	1,173,179	81,354	730,532	1,538,527	39,806,516	51,138,691	11,332,175	78%
2041	4	47	39,806,516	2,466,145	9,197	1,090,059	70,048	755,312	1,581,172	40,827,764	51,087,268	10,259,504	80%
2042	3	48	40,827,764	2,595,547	9,305	993,471	54,986	784,515	1,617,824	41,673,708	50,808,669	9,134,961	82%
2043	2	48	41,673,708	2,693,825	9,412	878,375	42,541	813,918	1,647,770	42,353,074	50,342,062	7,988,988	84%
2044	2	47	42,353,074	2,764,080	9,519	773,356	33,016	842,927	1,671,857	42,900,632	49,726,985	6,826,353	86%
2045	1	47	42,900,632	2,811,315	9,623	683,049	25,877	872,315	1,691,475	43,352,409	48,995,959	5,643,550	88%
2046	1	47	43,352,409	2,845,978	9,726	605,818	20,048	901,865	1,707,798	43,732,234	48,165,927	4,433,693	91%
2047	1	46	43,732,234	2,880,314	9,825	535,017	14,135	933,092	1,721,407	44,045,746	47,234,145	3,188,399	93%
2048	0	45	44,045,746	2,898,563	9,920	463,795	9,614	965,083	1,732,718	44,308,473	46,221,221	1,912,748	96%
2049	0	45	44,308,473	2,900,405	10,010	394,635	6,563	997,292	1,742,397	44,538,945	45,148,668	609,723	99%
2050	0	44	44,538,945	2,892,818	10,093	39,179	4,397	612,073	1,737,053	44,028,736	44,028,736	0	100%
2051	0	43	44,028,736	2,878,082	10,168	22,480	2,825	0	1,704,452	42,870,243	42,870,243	0	100%
2052	0	42	42,870,243	2,857,889	10,233	17,105	1,616	0	1,658,380	41,679,222	41,679,222	0	100%
2053	0	41	41,679,222	2,831,293	10,288	14,057	914	0	1,611,191	40,463,803	40,463,803	0	100%
2054	0	40	40,463,803	2,799,782	10,330	12,517	535	0	1,563,159	39,229,903	39,229,902	0	100%
2055	0	39	39,229,903	2,764,535	10,359	11,649	321	0	1,514,479	37,981,458	37,981,457	0	100%
2056	0	38	37,981,458	2,726,269	10,373	11,091	178	0	1,465,285	36,721,370	36,721,369	0	100%
2057	0	37	36,721,370	2,685,433	10,373	10,569	49	0	1,415,678	35,451,860	35,451,859	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	\$1,963,972	\$0	\$1,963,972	\$157,121	\$1,163,436	\$1,006,315	\$1,392,988	\$399,822	\$993,166	\$7,360	\$2,006,841	\$0
2019	1,936,280	89,470	2,025,750	155,463	1,144,579	989,116	1,483,595	417,208	1,066,387	7,348	2,062,851	9,394
2020	1,883,724	235,358	2,119,082	151,853	1,110,866	959,013	1,487,806	427,879	1,059,927	7,360	2,026,301	24,713
2021	1,843,120	352,825	2,195,945	149,090	1,085,108	936,018	1,486,286	440,281	1,046,005	7,396	1,989,418	37,047
2022	1,790,174	491,004	2,281,178	145,507	1,050,623	905,116	1,484,837	452,560	1,032,277	7,444	1,944,837	51,555
2023	1,754,382	628,921	2,383,303	143,188	1,025,585	882,397	1,482,873	464,318	1,018,555	7,502	1,908,454	66,037
2024	1,736,763	758,170	2,494,933	142,190	1,012,423	870,233	1,481,354	475,491	1,005,863	7,567	1,883,662	79,608
2025	1,735,177	880,727	2,615,904	142,369	1,009,420	867,051	1,480,492	486,272	994,220	7,636	1,868,907	92,474
2026	1,744,265	999,276	2,743,540	143,370	1,012,960	869,590	1,480,232	497,244	982,988	7,708	1,860,286	104,924
2027	1,764,341	1,117,513	2,881,854	145,204	1,023,377	878,173	1,480,387	508,197	972,190	7,785	1,858,148	117,339
2028	1,769,879	1,232,228	3,002,106	146,099	1,024,165	878,066	1,480,991	521,602	959,389	7,867	1,845,321	129,384
2029	1,744,036	1,373,715	3,117,751	144,870	1,004,050	859,180	1,481,031	536,185	944,846	7,959	1,811,984	144,240
2030	1,724,560	1,536,736	3,261,296	144,130	987,622	843,492	1,479,672	549,670	930,002	8,057	1,781,551	161,357
2031	1,696,123	1,689,956	3,386,079	142,415	967,126	824,711	1,478,400	565,506	912,894	8,154	1,745,759	177,445
2032	1,668,384	1,872,777	3,541,162	140,626	947,749	807,123	1,476,858	580,030	896,828	8,253	1,712,204	196,640
2033	1,635,954	2,038,628	3,674,582	138,814	927,624	788,810	1,475,317	596,801	878,516	8,353	1,675,679	214,056
2034	1,527,073	2,235,992	3,763,066	131,484	863,253	731,769	1,473,670	619,144	854,526	8,452	1,594,746	234,779
2035	1,403,220	2,497,056	3,900,275	122,967	789,383	666,416	1,468,525	638,995	829,530	8,554	1,504,501	262,191
2036	1,287,330	2,738,996	4,026,326	114,390	720,938	606,548	1,462,029	661,166	800,863	8,655	1,416,065	287,595
2037	1,170,329	3,012,341	4,182,670	105,505	652,573	547,068	1,455,583	682,748	772,835	8,759	1,328,663	316,296
2038	1,083,794	3,266,361	4,350,156	99,030	601,767	502,737	1,448,789	704,907	743,882	8,870	1,255,490	342,968
2039	981,685	3,512,505	4,494,190	90,473	542,032	451,559	1,443,172	730,532	712,640	8,980	1,173,179	368,813
2040	877,086	3,788,104	4,665,190	81,354	481,185	399,831	1,436,451	755,312	681,139	9,089	1,090,059	397,751
2041	751,662	4,049,101	4,800,763	70,048	409,887	339,839	1,428,949	784,515	644,434	9,197	993,471	425,156
2042	588,556	4,353,795	4,942,352	54,986	318,531	263,545	1,419,442	813,918	605,524	9,305	878,375	457,148
2043	454,108	4,658,489	5,112,596	42,541	243,417	200,876	1,405,995	842,927	563,068	9,412	773,356	489,141
2044	350,823	4,942,723	5,293,545	33,016	186,381	153,365	1,392,481	872,315	520,166	9,519	683,049	518,986
2045	273,825	5,215,431	5,489,256	25,877	144,016	118,139	1,379,920	901,865	478,055	9,623	605,818	547,620
2046	211,705	5,467,961	5,679,666	20,048	110,295	90,247	1,368,136	933,092	435,044	9,726	535,017	574,136
2047	148,978	5,727,222	5,876,200	14,135	77,397	63,262	1,355,791	965,083	390,708	9,825	463,795	601,358
2048	101,202	5,988,061	6,089,263	9,614	52,628	43,014	1,338,993	997,292	341,701	9,920	394,635	628,746
2049	69,087	6,245,565	6,314,651	6,563	35,732	29,169	1,313,127	612,073	282,850	10,010	39,179	655,784
2050	46,287	6,510,047	6,556,334	4,397	23,765	19,368	0	0	0	10,093	22,480	683,555
2051	29,733	6,779,659	6,809,392	2,825	15,134	12,309	0	0	0	10,168	17,105	711,864
2052	17,007	7,061,953	7,078,961	1,616	8,486	6,870	0	0	0	10,233	14,057	741,505
2053	9,623	7,351,409	7,361,032	914	4,686	3,772	0	0	0	10,288	12,517	771,898
2054	5,632	7,644,879	7,650,511	535	2,715	2,180	0	0	0	10,330	11,649	802,712
2055	3,376	7,947,661	7,951,037	321	1,615	1,294	0	0	0	10,359	11,091	834,504
2056	1,876	8,257,365	8,259,241	178	895	717	0	0	0	10,373	10,569	867,023
2057	520	8,581,231	8,581,752	49	244	195	0	0	0	10,373	10,357	901,029

^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	Employer	Member	Premium Tax			Assets	Accrued	Unfunded	Funded		
	Year End	Pay					Allocation	Investment	Income					Liability	Liability
30-Jun	Active	Status	(boy)	Payments	Expenses	Contribs.	Contribs.	Contribs.	Income	(eoy)	Liability	Liability	Ratio		
2017	43	35	\$2,748,447	\$931,208	\$2,738	\$383,643	\$145,280	\$385,377	\$156,124	\$2,884,925	\$28,472,232	\$25,587,307	10%		
2018	40	35	2,884,925	980,104	7,360	410,498	157,121	389,524	114,797	2,969,401	29,798,133	26,828,732	10%		
2019	37	37	2,969,401	1,034,089	7,348	784,514	155,463	399,822	124,685	3,392,447	31,102,787	27,710,339	11%		
2020	34	38	3,392,447	1,096,693	7,360	844,277	151,853	417,208	141,823	3,843,555	32,361,170	28,517,615	12%		
2021	32	39	3,843,555	1,156,832	7,396	903,123	149,090	427,879	159,998	4,319,416	33,582,583	29,263,167	13%		
2022	29	40	4,319,416	1,225,084	7,444	970,164	145,507	440,281	179,182	4,822,022	34,747,868	29,925,846	14%		
2023	27	41	4,822,022	1,279,965	7,502	1,022,877	143,188	452,560	199,439	5,352,618	35,878,447	30,525,829	15%		
2024	26	41	5,352,618	1,322,548	7,567	1,062,420	142,190	464,318	220,815	5,912,246	36,997,305	31,085,059	16%		
2025	25	41	5,912,246	1,355,924	7,636	1,092,016	142,369	475,491	243,348	6,501,910	38,123,787	31,621,877	17%		
2026	23	41	6,501,910	1,381,754	7,708	1,113,534	143,370	486,272	267,081	7,122,705	39,272,629	32,149,924	18%		
2027	23	41	7,122,705	1,400,489	7,785	1,127,232	145,204	497,244	292,065	7,776,175	40,458,993	32,682,818	19%		
2028	21	41	7,776,175	1,424,715	7,867	1,147,153	146,099	508,197	318,352	8,463,393	41,668,855	33,205,462	20%		
2029	20	42	8,463,393	1,469,055	7,959	1,188,051	144,870	521,602	346,012	9,186,914	42,861,381	33,674,467	21%		
2030	19	42	9,186,914	1,512,119	8,057	1,226,900	144,130	536,185	375,141	9,949,095	44,040,898	34,091,803	23%		
2031	17	43	9,949,095	1,561,316	8,154	1,273,081	142,415	549,670	405,800	10,750,591	45,196,645	34,446,054	24%		
2032	16	43	10,750,591	1,611,732	8,253	1,319,800	140,626	565,506	438,063	11,594,601	46,327,285	34,732,684	25%		
2033	15	43	11,594,601	1,670,485	8,353	1,375,238	138,814	580,030	472,008	12,481,853	47,422,935	34,941,082	26%		
2034	13	44	12,481,853	1,781,860	8,452	1,486,935	131,484	596,801	507,689	13,414,449	48,383,053	34,968,604	28%		
2035	12	45	13,414,449	1,900,702	8,554	1,605,245	122,967	619,144	545,254	14,397,803	49,185,003	34,787,200	29%		
2036	10	46	14,397,803	2,004,963	8,655	1,709,966	114,390	638,995	584,819	15,432,355	49,842,971	34,410,616	31%		
2037	9	46	15,432,355	2,105,676	8,759	1,810,676	105,505	661,166	626,462	16,521,730	50,354,804	33,833,074	33%		
2038	8	46	16,521,730	2,185,569	8,870	1,888,813	99,030	682,748	670,299	17,668,180	50,753,865	33,085,685	35%		
2039	6	47	17,668,180	2,275,037	8,980	1,978,183	90,473	704,907	716,422	18,874,148	51,016,663	32,142,515	37%		
2040	5	47	18,874,148	2,362,563	9,089	2,065,004	81,354	730,532	764,972	20,144,358	51,138,691	30,994,333	39%		
2041	4	47	20,144,358	2,466,145	9,197	2,170,031	70,048	755,312	816,073	21,480,479	51,087,268	29,606,789	42%		
2042	3	48	21,480,479	2,595,547	9,305	2,302,624	54,986	784,515	869,859	22,887,611	50,808,669	27,921,058	45%		
2043	2	48	22,887,611	2,693,825	9,412	2,401,840	42,541	813,918	926,497	24,369,170	50,342,062	25,972,893	48%		
2044	2	47	24,369,170	2,764,080	9,519	2,470,709	33,016	842,927	986,116	25,928,338	49,726,985	23,798,647	52%		
2045	1	47	25,928,338	2,811,315	9,623	2,514,439	25,877	872,315	1,048,851	27,568,882	48,995,959	21,427,077	56%		
2046	1	47	27,568,882	2,845,978	9,726	2,544,458	20,048	901,865	1,114,849	29,294,398	48,165,927	18,871,529	61%		
2047	1	46	29,294,398	2,880,314	9,825	2,573,672	14,135	933,092	1,184,268	31,109,426	47,234,145	16,124,720	66%		
2048	0	45	31,109,426	2,898,563	9,920	2,585,378	9,614	965,083	1,257,281	33,018,299	46,221,221	13,202,922	71%		
2049	0	45	33,018,299	2,900,405	10,010	2,579,366	6,563	997,292	1,334,056	35,025,161	45,148,668	10,123,507	78%		
2050	0	44	35,025,161	2,892,818	10,093	2,562,919	4,397	1,030,277	1,414,764	37,134,607	44,028,736	6,894,129	84%		
2051	0	43	37,134,607	2,878,082	10,168	2,538,735	2,825	1,063,510	1,499,580	39,351,007	42,870,243	3,519,236	92%		
2052	0	42	39,351,007	2,857,889	10,233	2,508,520	1,616	1,097,514	1,588,686	41,679,221	41,679,222	0	100%		
2053	0	41	41,679,221	2,831,293	10,288	14,057	914	0	1,611,191	40,463,802	40,463,803	0	100%		
2054	0	40	40,463,802	2,799,782	10,330	12,516	535	0	1,563,159	39,229,901	39,229,902	0	100%		
2055	0	39	39,229,901	2,764,535	10,359	11,649	321	0	1,514,479	37,981,456	37,981,457	0	100%		
2056	0	38	37,981,456	2,726,269	10,373	11,091	178	0	1,465,285	36,721,368	36,721,369	0	100%		
2057	0	37	36,721,368	2,685,433	10,373	10,570	49	0	1,415,678	35,451,859	35,451,859	0	100%		

Actuarial Projections – Conservation Funding in 2019

Table A-4

Plan Year End	Benefit Payment Account ^a							Accumulation Account ^b						Statewide Employer Contribution
	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	6.50% ^d of Pay Member Contribs.	32.64% 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 Member Contribs.	67.36% of Premium Tax Allocation	Investment Income	
2018	\$2,884,925	\$987,464	\$410,498	\$157,121	\$389,524	\$114,797	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	2,969,401	1,041,437	784,514	126,419	130,504	118,776	(3,088,177)	3,088,177	0	0	29,044	269,318	5,909	9,394
2020	0	1,104,053	844,277	123,597	136,179	0	0	3,392,448	0	0	28,256	281,028	141,823	24,713
2021	0	1,164,228	903,123	121,443	139,662	0	0	3,843,555	0	0	27,647	288,217	159,998	37,047
2022	0	1,232,528	970,164	118,654	143,710	0	0	4,319,417	0	0	26,853	296,570	179,182	51,555
2023	0	1,287,467	1,022,877	116,872	147,718	0	0	4,822,022	0	0	26,316	304,842	199,439	66,037
2024	0	1,330,115	1,062,420	116,139	151,556	0	0	5,352,619	0	0	26,051	312,762	220,815	79,608
2025	0	1,363,560	1,092,016	116,341	155,203	0	0	5,912,246	0	0	26,028	320,288	243,348	92,476
2026	0	1,389,462	1,113,534	117,206	158,722	0	0	6,501,911	0	0	26,164	327,550	267,081	104,924
2027	0	1,408,274	1,127,232	118,739	162,303	0	0	7,122,705	0	0	26,465	334,940	292,065	117,339
2028	0	1,432,582	1,147,153	119,551	165,878	0	0	7,776,176	0	0	26,548	342,318	318,352	129,384
2029	0	1,477,014	1,188,051	118,709	170,254	0	0	8,463,394	0	0	26,161	351,348	346,012	144,240
2030	0	1,520,176	1,226,900	118,262	175,014	0	0	9,186,915	0	0	25,868	361,171	375,141	161,357
2031	0	1,569,470	1,273,081	116,973	179,416	0	0	9,949,095	0	0	25,442	370,254	405,800	177,445
2032	0	1,619,985	1,319,800	115,600	184,585	0	0	10,750,591	0	0	25,026	380,922	438,063	196,642
2033	0	1,678,838	1,375,238	114,275	189,325	0	0	11,594,602	0	0	24,539	390,705	472,008	214,056
2034	0	1,790,312	1,486,935	108,578	194,799	0	0	12,481,853	0	0	22,906	402,002	507,689	234,779
2035	0	1,909,256	1,605,245	101,919	202,092	0	0	13,414,450	0	0	21,048	417,052	545,254	262,191
2036	0	2,013,618	1,709,966	95,080	208,572	0	0	14,397,803	0	0	19,310	430,423	584,819	287,595
2037	0	2,114,435	1,810,676	87,950	215,809	0	0	15,432,355	0	0	17,555	445,358	626,462	316,296
2038	0	2,194,439	1,888,813	82,773	222,853	0	0	16,521,730	0	0	16,257	459,895	670,299	342,968
2039	0	2,284,017	1,978,183	75,748	230,086	0	0	17,668,181	0	0	14,725	474,821	716,422	368,813
2040	0	2,371,652	2,065,004	68,198	238,450	0	0	18,874,149	0	0	13,156	492,082	764,972	397,751
2041	0	2,475,342	2,170,031	58,773	246,538	0	0	20,144,358	0	0	11,275	508,773	816,073	425,156
2042	0	2,604,852	2,302,624	46,158	256,070	0	0	21,480,480	0	0	8,828	528,444	869,859	457,148
2043	0	2,703,237	2,401,840	35,729	265,668	0	0	22,887,611	0	0	6,812	548,250	926,497	489,141
2044	0	2,773,599	2,470,709	27,754	275,136	0	0	24,369,170	0	0	5,262	567,790	986,116	518,986
2045	0	2,820,938	2,514,439	21,770	284,729	0	0	25,928,338	0	0	4,107	587,586	1,048,851	547,620
2046	0	2,855,704	2,544,458	16,872	294,374	0	0	27,568,882	0	0	3,176	607,491	1,114,849	574,136
2047	0	2,890,139	2,573,672	11,900	304,567	0	0	29,294,398	0	0	2,235	628,525	1,184,268	601,358
2048	0	2,908,483	2,585,378	8,096	315,009	0	0	31,109,426	0	0	1,518	650,074	1,257,281	628,746
2049	0	2,910,415	2,579,366	5,527	325,522	0	0	33,018,299	0	0	1,036	671,770	1,334,056	655,784
2050	0	2,902,911	2,562,919	3,703	336,289	0	0	35,025,161	0	0	694	693,988	1,414,764	683,555
2051	0	2,888,250	2,538,735	2,379	347,136	0	0	37,134,607	0	0	446	716,374	1,499,580	711,864
2052	0	2,868,116	2,508,520	1,361	358,235	0	0	39,351,007	6	0	255	739,278	1,588,686	741,505
2053	0	0	0	0	0	0	0	41,679,221	2,841,581	14,057	914	0	1,611,191	771,898
2054	0	0	0	0	0	0	0	40,463,802	2,810,112	12,516	535	0	1,563,159	802,712
2055	0	0	0	0	0	0	0	39,229,900	2,774,894	11,649	321	0	1,514,479	834,504
2056	0	0	0	0	0	0	0	37,981,455	2,736,642	11,091	178	0	1,465,285	867,023
2057	0	0	0	0	0	0	0	36,721,367	2,695,806	10,570	49	0	1,415,678	901,029

^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, 2040.

^d Blended employee contribution rate of 8.00% of pay less 1.50% of pay going into the Accumulation Account.

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 30-Jun	Pay	Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Member Contribs.	Allocation Contribs.	Investment Income	Assets (eoy)				
2017	43	35	\$2,748,447	\$931,208	\$2,738	\$383,643	\$145,280	\$385,377	\$156,124	\$2,884,925	\$28,472,232	\$25,587,307	10%	
2018	43	35	2,884,925	980,104	7,360	410,498	157,121	389,524	114,797	2,969,401	29,798,133	26,828,732	10%	
2019	43	37	2,969,401	1,034,089	7,600	439,233	164,621	399,822	118,023	3,049,411	31,155,170	28,105,759	10%	
2020	43	38	3,049,411	1,097,027	7,988	469,979	175,353	417,208	121,135	3,128,071	32,552,919	29,424,848	10%	
2021	43	39	3,128,071	1,158,331	8,284	502,878	183,603	427,879	124,088	3,199,903	33,986,806	30,786,903	9%	
2022	43	40	3,199,903	1,228,479	8,642	538,079	193,338	440,281	126,700	3,261,180	35,452,386	32,191,206	9%	
2023	43	41	3,261,180	1,285,732	8,991	575,745	204,245	452,560	129,216	3,328,223	36,974,085	33,645,862	9%	
2024	43	41	3,328,223	1,331,143	9,308	616,047	215,622	464,318	132,249	3,416,007	38,573,081	35,157,074	9%	
2025	43	41	3,416,007	1,367,758	9,603	659,170	227,580	475,491	136,340	3,537,228	40,268,024	36,730,796	9%	
2026	43	41	3,537,228	1,397,228	9,882	705,312	240,019	486,272	141,975	3,703,695	42,074,459	38,370,764	9%	
2027	43	41	3,703,695	1,420,030	10,158	754,684	253,291	497,244	149,634	3,928,360	44,010,534	40,082,174	9%	
2028	43	42	3,928,360	1,448,771	10,421	807,512	265,262	508,197	159,546	4,209,686	46,063,536	41,853,850	9%	
2029	43	42	4,209,686	1,498,006	10,756	864,038	277,915	521,602	171,453	4,535,932	48,211,852	43,675,920	9%	
2030	43	42	4,535,932	1,546,300	11,135	924,521	293,136	536,185	185,327	4,917,666	50,476,704	45,559,038	10%	
2031	43	43	4,917,666	1,601,119	11,470	989,237	306,258	549,670	201,313	5,351,554	52,846,472	47,494,918	10%	
2032	43	43	5,351,554	1,657,520	11,871	1,058,484	322,430	565,506	219,549	5,848,132	55,341,980	49,493,848	11%	
2033	43	44	5,848,132	1,722,700	12,210	1,132,578	336,684	580,030	240,152	6,402,666	57,948,823	51,546,157	11%	
2034	43	45	6,402,666	1,841,119	12,616	1,211,858	348,771	596,801	262,121	6,968,481	60,590,032	53,621,551	12%	
2035	43	46	6,968,481	1,967,866	13,160	1,296,688	366,024	619,144	284,696	7,554,008	63,286,291	55,732,283	12%	
2036	43	47	7,554,008	2,081,104	13,619	1,387,456	380,840	638,995	308,350	8,174,926	66,047,882	57,872,956	12%	
2037	43	47	8,174,926	2,192,084	14,142	1,484,578	397,860	661,166	333,679	8,845,983	68,898,289	60,052,306	13%	
2038	43	48	8,845,983	2,283,566	14,619	1,588,498	414,243	682,748	361,510	9,594,797	71,864,951	62,270,154	13%	
2039	43	49	9,594,797	2,388,119	15,108	1,699,693	428,248	704,907	392,300	10,416,717	74,917,645	64,500,928	14%	
2040	43	49	10,416,717	2,500,709	15,685	1,818,672	445,034	730,532	426,132	11,320,692	78,066,641	66,745,949	15%	
2041	43	50	11,320,692	2,639,818	16,231	1,945,979	457,811	755,312	462,790	12,286,535	81,271,685	68,985,150	15%	
2042	43	51	12,286,535	2,812,486	16,893	2,082,198	471,192	784,515	501,532	13,296,593	84,503,673	71,207,080	16%	
2043	43	52	13,296,593	2,963,531	17,559	2,227,952	486,486	813,918	542,701	14,386,559	87,799,233	73,412,674	16%	
2044	43	53	14,386,559	3,098,732	18,203	2,383,909	502,121	842,927	587,583	15,586,164	91,179,573	75,593,409	17%	
2045	43	54	15,586,164	3,226,935	18,860	2,550,783	518,970	872,315	637,235	16,919,672	94,659,487	77,739,815	18%	
2046	43	55	16,919,672	3,362,964	19,515	2,729,338	535,909	901,865	692,325	18,396,631	98,231,373	79,834,742	19%	
2047	43	55	18,396,631	3,520,488	20,209	2,920,392	554,064	933,092	753,033	20,016,515	101,889,080	81,872,565	20%	
2048	43	56	20,016,515	3,677,496	20,914	3,124,819	573,745	965,083	819,776	21,801,529	105,652,117	83,850,588	21%	
2049	43	56	21,801,529	3,827,965	21,619	3,343,556	595,053	997,292	893,575	23,781,421	109,538,103	85,756,682	22%	
2050	43	57	23,781,421	3,978,387	22,337	3,577,605	618,195	1,030,277	975,524	25,982,298	113,564,510	87,582,212	23%	
2051	43	57	25,982,298	4,127,881	23,055	3,828,037	642,597	1,063,510	1,066,685	28,432,192	117,747,487	89,315,295	24%	
2052	43	58	28,432,192	4,275,049	23,785	4,096,000	668,547	1,097,514	1,168,246	31,163,664	122,104,751	90,941,087	26%	
2053	43	58	31,163,664	4,419,257	24,516	4,382,720	694,826	1,131,797	1,281,512	34,210,747	126,653,855	92,443,108	27%	
2054	43	58	34,210,747	4,561,493	25,258	4,689,510	721,708	1,166,805	1,407,864	37,609,884	131,403,001	93,793,117	29%	
2055	43	58	37,609,884	4,708,019	26,025	5,017,776	749,678	1,203,224	1,548,689	41,395,207	136,357,949	94,962,742	30%	
2056	43	59	41,395,207	4,863,327	26,809	5,369,020	778,602	1,240,665	1,705,281	45,598,638	141,523,085	95,924,447	32%	
2057	43	59	45,598,638	5,027,124	27,619	5,744,851	809,127	1,279,498	1,878,975	50,256,346	146,906,991	96,650,645	34%	

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	\$1,963,972	\$157,121	\$1,163,436	\$1,006,315	\$1,392,988	\$399,822	\$993,166	\$7,360	\$2,006,841	\$439,233	\$439,233	\$0
2019	2,025,750	164,621	1,196,283	1,031,662	1,483,595	417,208	1,066,387	7,600	2,105,649	469,979	469,979	0
2020	2,119,082	175,353	1,246,969	1,071,616	1,580,118	427,879	1,152,239	7,988	2,231,844	502,878	502,878	0
2021	2,195,945	183,603	1,289,323	1,105,720	1,683,458	440,281	1,243,177	8,284	2,357,182	538,079	538,079	0
2022	2,281,178	193,338	1,335,006	1,141,668	1,794,301	452,560	1,341,741	8,642	2,492,051	575,745	575,745	0
2023	2,383,303	204,245	1,390,084	1,185,838	1,913,332	464,318	1,449,014	8,991	2,643,843	616,047	616,047	0
2024	2,494,933	215,622	1,452,116	1,236,495	2,041,882	475,491	1,566,391	9,308	2,812,193	659,170	659,170	0
2025	2,615,904	227,580	1,520,520	1,292,940	2,181,342	486,272	1,695,070	9,603	2,997,613	705,312	705,312	0
2026	2,743,540	240,019	1,593,223	1,353,204	2,333,290	497,244	1,836,046	9,882	3,199,132	754,684	754,684	0
2027	2,881,854	253,291	1,672,695	1,419,404	2,499,408	508,197	1,991,211	10,158	3,420,773	807,512	807,512	0
2028	3,002,106	265,262	1,740,578	1,475,315	2,681,761	521,602	2,160,159	10,421	3,645,895	864,038	864,038	0
2029	3,117,751	277,915	1,803,096	1,525,181	2,881,652	536,185	2,345,467	10,756	3,881,404	924,521	924,521	0
2030	3,261,296	293,136	1,881,832	1,588,696	3,100,788	549,670	2,551,118	11,135	4,150,949	989,237	989,237	0
2031	3,386,079	306,258	1,950,922	1,644,664	3,342,792	565,506	2,777,286	11,470	4,433,420	1,058,484	1,058,484	0
2032	3,541,162	322,430	2,038,283	1,715,853	3,610,574	580,030	3,030,544	11,871	4,758,269	1,132,578	1,132,578	0
2033	3,674,582	336,684	2,115,149	1,778,465	3,909,230	596,801	3,312,429	12,210	5,103,104	1,211,858	1,211,858	0
2034	3,763,066	348,771	2,166,012	1,817,242	4,243,393	619,144	3,624,249	12,616	5,454,107	1,296,688	1,296,688	0
2035	3,900,275	366,024	2,244,257	1,878,233	4,617,180	638,995	3,978,185	13,160	5,869,578	1,387,456	1,387,456	0
2036	4,026,326	380,840	2,317,019	1,936,179	5,039,896	661,166	4,378,730	13,619	6,328,528	1,484,578	1,484,578	0
2037	4,182,670	397,860	2,408,130	2,010,270	5,521,836	682,748	4,839,088	14,142	6,863,500	1,588,498	1,588,498	0
2038	4,350,156	414,243	2,505,256	2,091,013	6,078,063	704,907	5,373,156	14,619	7,478,788	1,699,693	1,699,693	0
2039	4,494,190	428,248	2,587,869	2,159,622	6,727,854	730,532	5,997,322	15,108	8,172,052	1,818,672	1,818,672	0
2040	4,665,190	445,034	2,685,587	2,240,553	7,494,885	755,312	6,739,573	15,685	8,995,811	1,945,979	1,945,979	0
2041	4,800,763	457,811	2,763,854	2,306,043	8,416,436	784,515	7,631,921	16,231	9,954,196	2,082,198	2,082,198	0
2042	4,942,352	471,192	2,846,738	2,375,545	9,544,363	813,918	8,730,445	16,893	11,122,884	2,227,952	2,227,952	0
2043	5,112,596	486,486	2,945,552	2,459,067	10,959,737	842,927	10,116,810	17,559	12,593,436	2,383,909	2,383,909	0
2044	5,293,545	502,121	3,050,645	2,548,524	12,795,831	872,315	11,923,516	18,203	14,490,243	2,550,783	2,550,783	0
2045	5,489,256	518,970	3,164,288	2,645,318	15,280,904	901,865	14,379,039	18,860	17,043,218	2,729,338	2,729,338	0
2046	5,679,666	535,909	3,275,840	2,739,931	18,846,048	933,092	17,912,956	19,515	20,672,402	2,920,392	2,920,392	0
2047	5,876,200	554,064	3,392,985	2,838,921	24,412,883	965,083	23,447,800	20,209	26,306,929	3,124,819	3,124,819	0
2048	6,089,263	573,745	3,519,670	2,945,925	34,383,017	997,292	33,385,725	20,914	36,352,563	3,343,556	3,343,556	0
2049	6,314,651	595,053	3,652,483	3,057,429	57,564,545	1,030,277	56,534,268	21,619	59,613,317	3,577,605	3,577,605	0
2050	6,556,334	618,195	3,794,417	3,176,222	87,454,970	1,063,510	86,391,460	22,337	89,590,018	3,828,037	3,828,037	0
2051	6,809,392	642,597	3,942,625	3,300,028	89,316,652	1,097,514	88,219,138	23,055	91,542,221	4,096,000	4,096,000	0
2052	7,078,961	668,547	4,100,083	3,431,536	91,084,056	1,131,797	89,952,259	23,785	93,407,581	4,382,720	4,382,720	0
2053	7,361,032	694,826	4,264,440	3,569,614	92,742,045	1,166,805	91,575,240	24,516	95,169,370	4,689,510	4,689,510	0
2054	7,650,511	721,708	4,432,419	3,710,711	94,273,811	1,203,224	93,070,587	25,258	96,806,555	5,017,776	5,017,776	0
2055	7,951,037	749,678	4,606,286	3,856,608	95,650,555	1,240,665	94,409,890	26,025	98,292,524	5,369,020	5,369,020	0
2056	8,259,241	778,602	4,784,402	4,005,800	96,843,342	1,279,498	95,563,844	26,809	99,596,454	5,744,851	5,744,851	0
2057	8,581,752	809,127	4,970,685	4,161,558	97,824,093	1,319,283	96,504,810	27,619	100,693,987	6,146,991	6,146,991	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 2040

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.	Member Contribs.	Premium Tax		Assets (eoy)				
		Active	Pay Status						Allocation Contribs.	Investment Income					
2017	43	35	\$2,748,447	\$931,208	\$2,738	\$383,643	\$145,280	\$385,377	\$156,124	\$2,884,925	\$28,472,232	\$25,587,307	10%		
2018	43	35	2,884,925	980,104	7,360	410,498	157,121	389,524	114,797	2,969,401	29,798,133	26,828,732	10%		
2019	43	37	2,969,401	1,034,089	7,600	439,233	164,621	399,822	118,023	3,049,411	31,155,170	28,105,759	10%		
2020	43	38	3,049,411	1,097,027	7,988	469,979	175,353	417,208	121,135	3,128,071	32,552,919	29,424,848	10%		
2021	43	39	3,128,071	1,158,331	8,284	502,878	183,603	427,879	124,088	3,199,904	33,986,806	30,786,902	9%		
2022	43	40	3,199,904	1,228,479	8,642	538,079	193,338	440,281	126,701	3,261,182	35,452,386	32,191,204	9%		
2023	43	41	3,261,182	1,285,732	8,991	575,745	204,245	452,560	129,216	3,328,225	36,974,085	33,645,860	9%		
2024	43	41	3,328,225	1,331,143	9,308	616,047	215,622	464,318	132,248	3,416,009	38,573,081	35,157,072	9%		
2025	43	41	3,416,009	1,367,758	9,603	659,170	227,580	475,491	136,341	3,537,230	40,268,024	36,730,794	9%		
2026	43	41	3,537,230	1,397,228	9,882	705,312	240,019	486,272	141,974	3,703,697	42,074,459	38,370,762	9%		
2027	43	41	3,703,697	1,420,030	10,158	754,684	253,291	497,244	149,634	3,928,362	44,010,534	40,082,172	9%		
2028	43	42	3,928,362	1,448,771	10,421	807,512	265,262	508,197	159,546	4,209,687	46,063,536	41,853,849	9%		
2029	43	42	4,209,687	1,498,006	10,756	864,038	277,915	521,602	171,453	4,535,933	48,211,852	43,675,919	9%		
2030	43	42	4,535,933	1,546,300	11,135	924,521	293,136	536,185	185,327	4,917,667	50,476,704	45,559,037	10%		
2031	43	43	4,917,667	1,601,119	11,470	989,237	306,258	549,670	201,313	5,351,556	52,846,472	47,494,916	10%		
2032	43	43	5,351,556	1,657,520	11,871	1,058,484	322,430	565,506	219,549	5,848,134	55,341,980	49,493,846	11%		
2033	43	44	5,848,134	1,722,700	12,210	1,132,578	336,684	580,030	240,151	6,402,667	57,948,823	51,546,156	11%		
2034	43	45	6,402,667	1,841,119	12,616	1,211,858	348,771	596,801	262,121	6,968,483	60,590,032	53,621,549	12%		
2035	43	46	6,968,483	1,967,866	13,160	1,296,688	366,024	619,144	284,697	7,554,010	63,286,291	55,732,281	12%		
2036	43	47	7,554,010	2,081,104	13,619	1,387,456	380,840	638,995	308,350	8,174,928	66,047,882	57,872,954	12%		
2037	43	47	8,174,928	2,192,084	14,142	1,484,578	397,860	661,166	333,679	8,845,985	68,898,289	60,052,304	13%		
2038	43	48	8,845,985	2,283,566	14,619	1,588,498	414,243	682,748	361,510	9,594,799	71,864,951	62,270,152	13%		
2039	40	49	9,594,799	2,388,119	15,108	1,699,693	428,248	704,907	392,300	10,416,720	74,917,645	64,500,925	14%		
2040	37	49	10,416,720	2,500,709	15,149	1,776,231	421,226	730,532	424,831	11,253,682	77,930,465	66,676,783	14%		
2041	34	50	11,253,682	2,638,951	15,220	1,910,081	411,083	755,312	458,511	12,134,498	80,855,374	68,720,876	15%		
2042	32	51	12,134,498	2,809,113	15,316	2,077,538	396,235	784,515	493,972	13,062,329	83,627,208	70,564,879	16%		
2043	29	52	13,062,329	2,956,252	15,434	2,221,003	382,553	813,918	531,321	14,039,438	86,270,549	72,231,111	16%		
2044	27	53	14,039,438	3,086,284	15,570	2,346,952	369,743	842,927	570,643	15,067,849	88,802,777	73,734,928	17%		
2045	25	54	15,067,849	3,208,318	15,720	2,464,735	356,988	872,315	612,022	16,149,870	91,225,779	75,075,909	18%		
2046	23	54	16,149,870	3,337,187	15,883	2,589,498	343,869	901,865	655,543	17,287,575	93,521,876	76,234,301	18%		
2047	21	55	17,287,575	3,486,461	16,056	2,734,816	329,453	933,092	701,303	18,483,722	95,662,996	77,179,274	19%		
2048	19	56	18,483,722	3,633,895	16,238	2,877,711	315,260	965,083	749,408	19,741,051	97,651,744	77,910,693	20%		
2049	18	56	19,741,051	3,773,385	16,428	3,011,819	301,854	997,292	799,963	21,062,166	99,491,247	78,429,081	21%		
2050	16	56	21,062,166	3,911,511	16,625	3,143,850	288,790	1,030,277	853,077	22,450,024	101,180,565	78,730,541	22%		
2051	15	57	22,450,024	4,047,714	16,826	3,273,710	275,856	1,063,510	908,864	23,907,424	102,718,431	78,811,007	23%		
2052	14	57	23,907,424	4,180,734	17,030	3,400,259	262,631	1,097,514	967,439	25,437,502	104,100,570	78,663,068	24%		
2053	12	57	25,437,502	4,309,959	17,232	3,523,922	248,324	1,131,797	1,028,924	27,043,278	105,324,061	78,280,783	26%		
2054	11	57	27,043,278	4,436,090	17,432	3,645,380	232,545	1,166,805	1,093,439	28,727,925	106,372,242	77,644,317	27%		
2055	10	58	28,727,925	4,565,001	17,631	3,770,340	215,042	1,203,224	1,161,118	30,495,017	107,221,324	76,726,307	28%		
2056	9	58	30,495,017	4,700,550	17,825	3,902,762	195,885	1,240,665	1,232,098	32,348,051	107,845,201	75,497,150	30%		
2057	7	58	32,348,051	4,842,918	18,016	4,042,577	175,146	1,279,498	1,306,523	34,290,861	108,218,517	73,927,656	32%		

Actuarial Projections – Conservation Funding in 2040

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.	6.50% ^d of Pay Member Contribs.	52.69% of Premium Tax Allocation	Investment Income	Assets (boy) ^c	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Member Contribs.	47.31% of Premium Tax Allocation	Investment Income	Conservation Employer Cont.	Alternative Employer Cont.	Minimum Alt /Cons Cont.	
2018	\$2,884,925	\$987,464	\$410,498	\$157,121	\$389,524	\$114,797	\$0	\$0	\$0	\$0	\$0	\$0	NA	\$410,498	\$410,498	\$0
2019	2,969,401	1,041,689	439,233	164,621	399,822	118,023	0	0	0	0	0	0	NA	439,233	439,233	0
2020	3,049,411	1,105,015	469,979	175,353	417,208	121,135	0	0	0	0	0	0	NA	469,979	469,979	0
2021	3,128,070	1,166,615	502,878	183,603	427,879	124,088	0	0	0	0	0	0	NA	502,878	502,878	0
2022	3,199,903	1,237,121	538,079	193,338	440,281	126,701	0	0	0	0	0	0	NA	538,079	538,079	0
2023	3,261,181	1,294,723	575,745	204,245	452,560	129,216	0	0	0	0	0	0	NA	575,745	575,745	0
2024	3,328,224	1,340,451	616,047	215,622	464,318	132,248	0	0	0	0	0	0	NA	616,047	616,047	0
2025	3,416,008	1,377,361	659,170	227,580	475,491	136,341	0	0	0	0	0	0	NA	659,170	659,170	0
2026	3,537,229	1,407,110	705,312	240,019	486,272	141,974	0	0	0	0	0	0	NA	705,312	705,312	0
2027	3,703,696	1,430,188	754,684	253,291	497,244	149,634	0	0	0	0	0	0	NA	754,684	754,684	0
2028	3,928,361	1,459,192	807,512	265,262	508,197	159,546	0	0	0	0	0	0	NA	807,512	807,512	0
2029	4,209,685	1,508,762	864,038	277,915	521,602	171,453	0	0	0	0	0	0	NA	864,038	864,038	0
2030	4,535,931	1,557,435	924,521	293,136	536,185	185,327	0	0	0	0	0	0	NA	924,521	924,521	0
2031	4,917,666	1,612,589	989,237	306,258	549,670	201,313	0	0	0	0	0	0	NA	989,237	989,237	0
2032	5,351,554	1,669,391	1,058,484	322,430	565,506	219,549	0	0	0	0	0	0	NA	1,058,484	1,058,484	0
2033	5,848,133	1,734,910	1,132,578	336,684	580,030	240,151	0	0	0	0	0	0	NA	1,132,578	1,132,578	0
2034	6,402,666	1,853,735	1,211,858	348,771	596,801	262,121	0	0	0	0	0	0	NA	1,211,858	1,211,858	0
2035	6,968,482	1,981,026	1,296,688	366,024	619,144	284,697	0	0	0	0	0	0	NA	1,296,688	1,296,688	0
2036	7,554,009	2,094,723	1,387,456	380,840	638,995	308,350	0	0	0	0	0	0	NA	1,387,456	1,387,456	0
2037	8,174,926	2,206,226	1,484,578	397,860	661,166	333,679	0	0	0	0	0	0	NA	1,484,578	1,484,578	0
2038	8,845,984	2,298,185	1,588,498	414,243	682,748	361,510	0	0	0	0	0	0	NA	1,588,498	1,588,498	0
2039	9,594,797	2,403,227	1,699,693	428,248	704,907	392,300	0	0	0	0	0	0	NA	1,699,693	1,699,693	0
2040	10,416,718	2,515,858	1,776,231	354,737	384,890	416,669	10,833,389	0	0	66,489	345,642	8,162	1,776,231	1,818,672	1,776,231	24,421
2041	0	2,654,171	1,910,081	346,144	397,946	0	11,253,681	0	0	64,939	357,366	458,511	1,910,081	1,945,979	1,910,081	49,508
2042	0	2,824,429	2,077,538	333,559	413,332	0	12,134,497	0	0	62,676	371,183	493,972	2,077,538	2,082,198	2,077,538	80,214
2043	0	2,971,686	2,221,003	321,860	428,823	0	13,062,328	0	0	60,693	385,095	531,321	2,221,003	2,227,952	2,221,003	111,972
2044	0	3,101,854	2,346,952	310,795	444,107	0	14,039,437	0	0	58,948	398,820	570,643	2,346,952	2,383,909	2,346,952	143,184
2045	0	3,224,038	2,464,735	299,713	459,590	0	15,067,848	0	0	57,275	412,724	612,022	2,464,735	2,550,783	2,464,735	175,448
2046	0	3,353,070	2,589,498	288,413	475,159	0	16,149,869	0	0	55,456	426,706	655,543	2,589,498	2,729,338	2,589,498	208,171
2047	0	3,502,517	2,734,816	276,089	491,612	0	17,287,574	0	0	53,364	441,480	701,303	2,734,816	2,920,392	2,734,816	243,451
2048	0	3,650,133	2,877,711	263,955	508,467	0	18,483,721	0	0	51,305	456,616	749,408	2,877,711	3,124,819	2,877,711	280,237
2049	0	3,789,813	3,011,819	252,558	525,436	0	19,741,051	0	0	49,296	471,856	799,963	3,011,819	3,343,556	3,011,819	317,965
2050	0	3,928,136	3,143,850	241,471	542,815	0	21,062,165	0	0	47,319	487,462	853,077	3,143,850	3,577,605	3,143,850	357,181
2051	0	4,064,540	3,273,710	230,506	560,324	0	22,450,024	0	0	45,350	503,186	908,864	3,273,710	3,828,037	3,273,710	397,536
2052	0	4,197,764	3,400,259	219,266	578,239	0	23,907,424	0	0	43,365	519,274	967,439	3,400,259	4,096,000	3,400,259	439,734
2053	0	4,327,191	3,523,922	206,967	596,302	0	25,437,502	0	0	41,357	535,495	1,028,924	3,523,922	4,382,720	3,523,922	483,408
2054	0	4,453,522	3,645,380	193,396	614,746	0	27,043,278	0	0	39,149	552,059	1,093,439	3,645,380	4,689,510	3,645,380	529,259
2055	0	4,582,632	3,770,340	178,358	633,934	0	28,727,925	0	0	36,684	569,290	1,161,118	3,770,340	5,017,776	3,770,340	578,072
2056	0	4,718,375	3,902,762	161,953	653,660	0	30,495,017	0	0	33,932	587,004	1,232,098	3,902,762	5,369,020	3,902,762	629,700
2057	0	4,860,934	4,042,577	144,237	674,120	0	32,348,051	0	0	30,909	605,378	1,306,523	4,042,577	5,744,851	4,042,577	684,722

^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, 2040.

^d Blended employee contribution rate of 8.00% of pay less 1.50% of pay going into the Accumulation Account.