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

Actuarial Valuation Report for the Year Beginning July 1, 2017

GRS Retirement Consulting
P: 312.456.9800 | F: 312.683.3271 | www.grsconsulting.com

September 6, 2018

Ms. Connie L. Fulknier	Lt. Josh W. Bowers
City Clerk	Pension Board Secretary
P.O. Box 483	City of Dunbar Firemen's Pension and Relief Fund
Dunbar, WV 25064	

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

Dear Ms. Fulknier and Lt. Bowers:

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

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

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

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

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

120 North LaSalle Street | Suite 1350 | Chicago, Illinois 60602-3495

This actuarial valuation is based upon:

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

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

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

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

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

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

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

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

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

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

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

Lance J. Weiss

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

Contents

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 Dunbar, West Virginia Firemen's Pension and Relief Fund ("Fund" or "Plan").

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

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

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

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

- The sponsor's initial Alternative contribution effective for plan year 1991 is the greater of 107% of the amount contributed for the plan year ended June 30, 1990, or the highest five-year average of contributions made since 1984.

- Sponsor contributions made in subsequent years cannot be less than 107% of the contribution made in the prior fiscal year.

- The actuary must certify in writing that the Fund is projected to be solvent under the Alternative funding policy for the next consecutive 15-year period. A plan is deemed to be solvent if projected assets are greater than zero over the 15-year projection period.

- Beginning September 1, 2003, any municipality which elected the Alternative funding policy has the option of reverting to the Standard funding policy if the plan's funded ratio is greater than 80%. In this case, the Standard minimum contribution equals the normal cost plus the amortization of the unfunded liability over a period of not more than 40 years commencing from July 1, 1991, less the allocable portion of the state premium tax fund for municipal pension and relief funds.

- Plan members hired before January 1, 2010, contribute 7.0% of pay; however, if elected by the Board of Trustees of the Plan, member contributions may be increased up to 9.5% of pay. The Board elected to increase member contributions to 8.0% 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	$805,463
Actuarial Accrued Liability	$13,254,546
Unfunded Actuarial Accrued Liability	$12,449,083
Funded Ratio	6.08%

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	$415,114
7% Increase in Alternative Contribution	$29,058
FYE 06/30/2018 Alternative Contribution	$444,172
Additional Contribution	$0
Final FYE 06/30/2018 Alternative Contribution	$444,172

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	$444,172
7% Increase in Alternative Contribution	$31,092
FYE 06/30/2019 Alternative Contribution	$475,264
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	$475,264
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	$475,264

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 6.08%, and that the ratio of assets to expected benefits for the year is only 1.39, 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 7% (using a testing interest rate of 5.50% for all plans using the Alternative funding policy), ratio of assets to benefits of 1.39, equity allocation of 32%, and 15-year projected funded ratio of 49%, resulted in a discount rate assumption of 4.50%.
- The Fund experienced an approximate annualized return of 7.33% on the market value of assets during the plan year ended June 30, 2017, which compares to the expected annualized return of 4.50%. The difference in actual versus expected return produced an asset (gain)/loss of ($13,688).
- 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 ($11,318) due to these events.

Alternative Funding

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

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

- The funded ratio is projected to increase slowly from 6% at June 30, 2017, to 9% at June 30, 2021, to 19% at June 30, 2026, to 49% at June 30, 2034, and then increase to 100% at 2042.
- Employer contributions are expected to increase from $444,172 (or 94% of pay) for the fiscal year end June 30, 2018, to $2,105,608 (or 197% of pay) for fiscal year end June 30, 2041.

Please note that a funded ratio of only 6% at June 30, 2017, means that the plan is severely underfunded and is effectively operating on a pay-as-you-go basis.

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 $475,264 is sufficient to finance 100% of the net employer normal cost of $207,874 and only 2.1% of the unfunded liability of $12,449,083. The state premium tax allocation of $158,206 is sufficient to finance only 1.3% of the unfunded actuarial accrued liability of $12,449,083.

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 4.50%, the funded ratio will be lower and the cash flow strain could be higher. If another significant market downtown occurs while the plan's funded ratio is declining, the plan may need to liquidate assets in order to pay benefits which could have a further adverse effect on the funded status of the System.

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

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

- If retired members die *later* than expected, contributions will increase. If retired members die *sooner* than expected, contributions will decrease.
- If the general inflation is *greater* than assumed, supplemental benefits will be greater than assumed and contributions will *increase*. Conversely, if general inflation is *lower* than assumed, contributions will *decrease*.

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

Schedule A: Summary of Key Valuation Results

Valuation Date		**July 1, 2016**		**July 1, 2017**
Valuation Interest Rate		4.50%		4.50%
Cost-of-Living Adjustment		2.75%		2.75%
Wage Inflation		3.75%		3.75%
Expected Payroll		$619,269		$470,997
Average Pay		$47,636		$47,100
Expected Benefit Payments		$545,238		$578,698
1. Actuarial Accrued Liability	No.		No.	
(a) Actives	13	$3,503,737	10	$2,354,563
(b) Retirees	14	$7,178,822	17	$9,155,202
(c) Survivors	3	$336,153	3	$323,475
(d) Disabled Members	4	$1,894,476	3	$1,421,306
(e) Deferred Vested Members	0	$0	0	$0
(f) Total	34	$12,913,188	33	$13,254,546
2. Present Value of Future Normal Costs		$3,983,715		$3,370,433
3. Present Value of Benefits (1(f) + 2)		$16,896,903		$16,624,979
4. Market Value of Assets		$682,046		$805,463
5. Unfunded Actuarial Accrued Liability (1(f) - 4)		$12,231,142		$12,449,083
6. Funded Ratio (4 / 1(f))		5.28%		6.08%
7. Net Employer Normal Cost				
(a) Normal Cost		$320,736		$244,966
(b) Administrative Expenses		$2,911		$2,624
(c) Gross Normal Cost (a + b)		$323,647		$247,590
(d) Employee Contribution Rate [a]		8.36%		8.43%
(e) Expected Employee Contributions		$51,785		$39,716
(f) Net Employer Normal Cost (c - e)		$271,862		$207,874
(% of Compensation)		43.90%		44.13%
		FYE 2018		**FYE 2019**
8. Estimated Minimum Employer Contribution [b]				
(a) Prior Year Alternative Contribution		$415,114		$444,172
(b) Increase in Alternative Contribution		7.00%		7.00%
(c) Current Year Alternative Contribution		$444,172		$475,264
(d) Additional Contribution		$0		$0
(e) Alternative Contribution (c + d)		$444,172		$475,264

[a] Blended rate reflecting 8.0% 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.

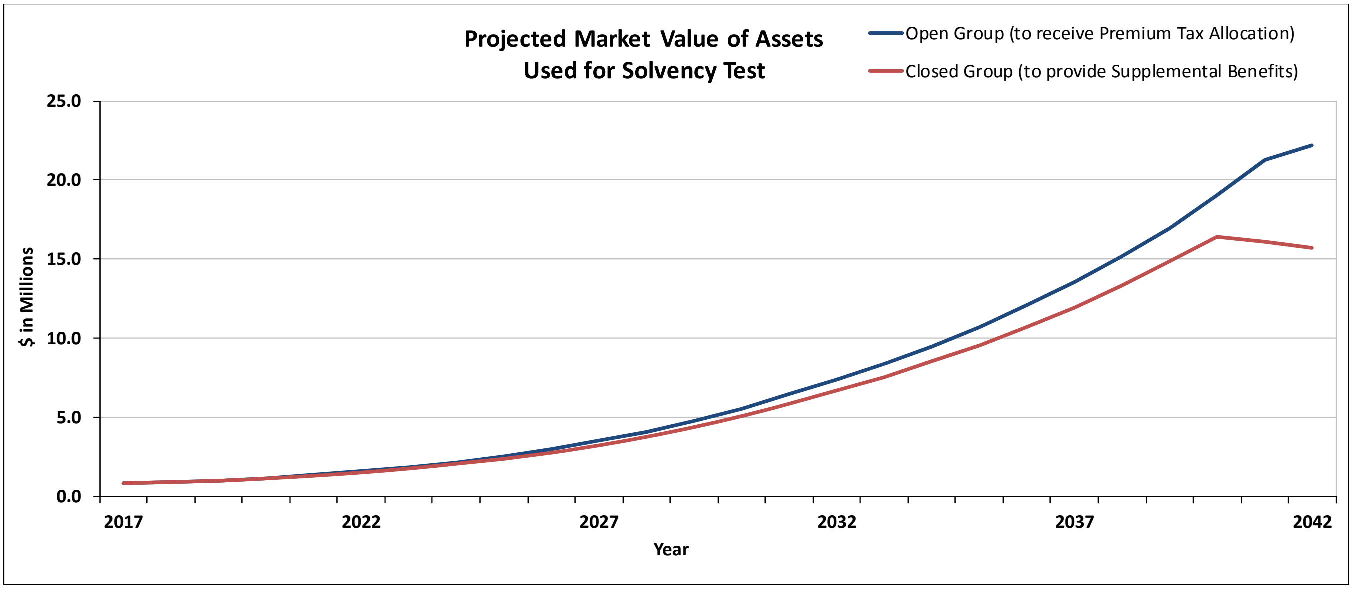
Schedule B: (Gain)/Loss Analysis

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

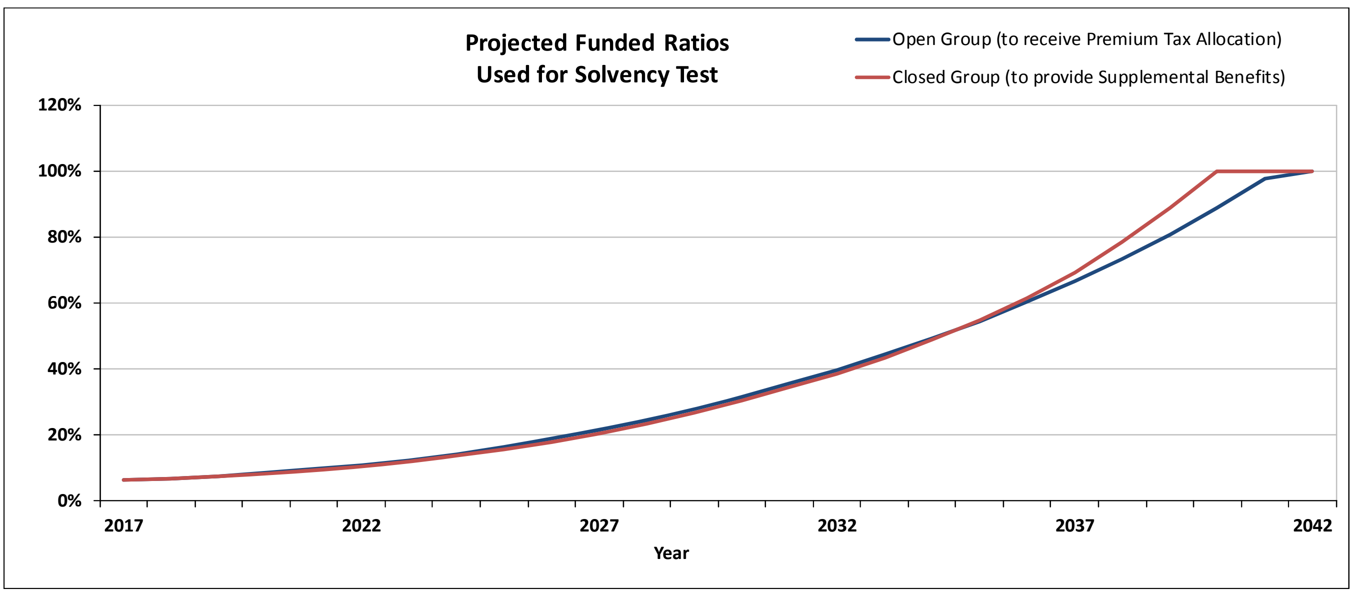
1.	(a) Actuarial Accrued Liability as of 7/1/2016	$12,913,188
	(b) Normal Cost due 7/1/2016	$320,736
	(c) Interest on (a) and (b) to 6/30/2017	$588,310
	(d) Benefit Payments with interest to 6/30/2017	$556,370
	(e) Effect of Assumption Changes	$0
	(f) Expected Liability at 7/1/2017 [(a) + (b) + (c) - (d) + (e)]	$13,265,864
	(g) Actual Liability at 7/1/2017	$13,254,546
	(h) Liability (Gain)/Loss [(g) - (f)]	**($11,318)**
2.	(a) Market Value of Assets as of 7/1/2016	$682,046
	(b) Interest on (a) to 6/30/2017	$30,692
	(c) Contributions with interest to 6/30/2017	$635,407
	(d) Benefit Payments with interest to 6/30/2017	$556,370
	(e) Expected Assets at 6/30/2017 [(a) + (b) + (c) - (d)]	$791,775
	(f) Actual Assets at 7/1/2017	$805,463
	(g) Asset (Gain)/Loss [(e) - (f)]	**($13,688)**
3.	Total (Gain)/Loss [1(h) + 2(g)]	**($25,006)**

Graphs 1A and 1B: Solvency Projections

Graph 1A



Graph 1B



SECTION II

ACTUARIAL PROJECTIONS

ALTERNATIVE FUNDING POLICY

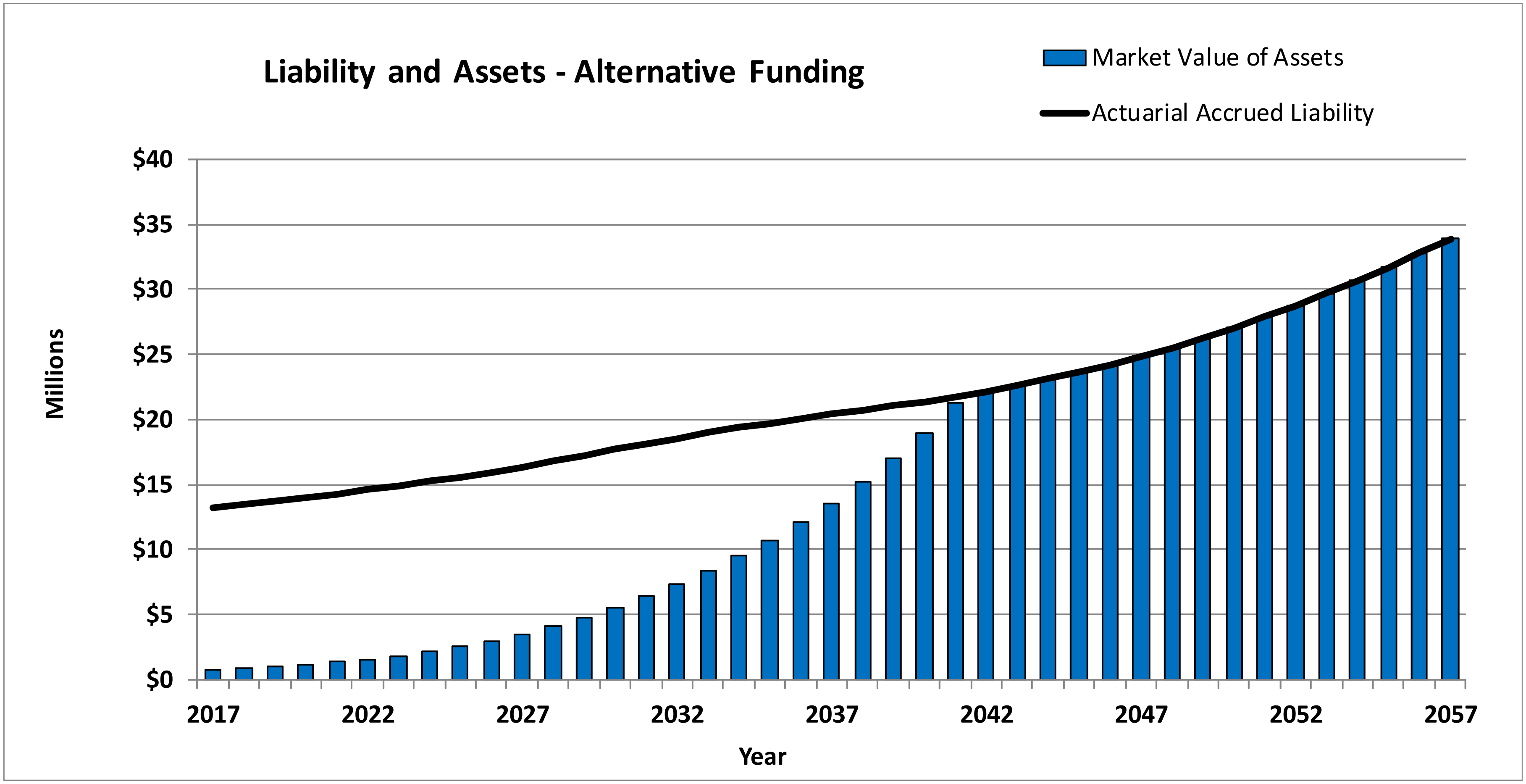
Alternative Funding on a Closed Group Basis, Table 1

Valuation Plan Year End 30-Jun	Number Active	Number Pay Status	Total Payroll	Total Assets: Assets (boy)	Benefit Payments	Expenses	Employer Contributions	Employee Contributions	Premium Tax Allocation Contributions	Investment Income	Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
2017	10	23	$619,269	$682,046	$544,127	$6,357	$415,114	$57,782	$148,389	$52,616	$805,463	$13,254,546	$12,449,083	6%
2018	10	23	470,997	805,463	578,698	2,624	444,172	39,716	165,524	37,761	911,314	13,509,868	12,598,554	7%
2019	9	23	482,039	911,314	599,350	2,648	475,264	40,643	158,206	42,614	1,026,043	13,761,636	12,735,593	7%
2020	9	22	494,121	1,026,043	626,260	2,676	508,532	41,655	154,828	47,864	1,149,987	14,003,660	12,853,673	8%
2021	9	22	507,870	1,149,987	629,291	2,706	544,129	42,809	154,841	54,192	1,313,961	14,260,829	12,946,868	9%
2022	9	22	522,647	1,313,961	633,456	2,740	582,218	44,051	155,176	62,360	1,521,571	14,533,298	13,011,727	10%
2023	8	22	525,296	1,521,571	647,617	2,774	622,973	44,328	155,588	72,309	1,766,377	14,804,726	13,038,349	12%
2024	8	22	523,293	1,766,377	663,313	2,810	666,581	44,238	154,116	83,911	2,049,100	15,071,183	13,022,083	14%
2025	7	22	530,735	2,049,100	672,647	2,847	713,242	44,910	154,100	97,478	2,383,336	15,343,903	12,960,567	16%
2026	7	22	540,320	2,383,336	677,901	2,885	763,169	45,752	154,403	113,538	2,779,412	15,628,596	12,849,184	18%
2027	7	22	551,450	2,779,412	682,624	2,925	816,591	46,718	155,018	132,479	3,244,668	15,927,136	12,682,468	20%
2028	7	22	563,899	3,244,668	685,997	2,967	873,752	47,790	155,880	154,654	3,787,780	16,242,225	12,454,445	23%
2029	6	22	562,487	3,787,780	696,658	3,010	934,915	47,754	156,891	180,239	4,407,911	16,558,947	12,151,036	27%
2030	5	22	540,205	4,407,911	722,031	3,053	1,000,359	46,050	155,693	208,971	5,093,900	16,850,700	11,756,800	30%
2031	5	22	506,769	5,093,900	754,070	3,095	1,070,384	43,455	154,352	240,597	5,845,523	17,104,060	11,258,537	34%
2032	4	22	464,555	5,845,523	792,284	3,137	1,145,311	40,158	152,781	275,128	6,663,480	17,306,435	10,642,955	39%
2033	3	23	415,063	6,663,480	831,168	3,177	1,225,483	36,041	151,292	312,729	7,554,679	17,450,672	9,895,993	43%
2034	3	23	346,178	7,554,679	887,771	3,217	1,311,267	30,284	149,585	353,315	8,508,143	17,508,418	9,000,275	49%
2035	2	23	283,780	8,508,143	940,684	3,255	1,403,056	25,229	148,280	396,944	9,537,713	17,484,498	7,946,785	55%
2036	2	23	237,784	9,537,713	972,402	3,291	1,501,270	21,338	148,459	444,671	10,677,757	17,403,375	6,725,618	61%
2037	1	24	177,082	10,677,757	1,011,742	3,325	1,606,359	15,924	148,183	497,308	11,930,464	17,246,202	5,315,738	69%
2038	1	23	122,781	11,930,464	1,045,013	3,356	1,718,804	11,025	147,894	555,326	13,315,144	17,019,151	3,704,007	78%
2039	0	23	87,997	13,315,144	1,062,836	3,384	1,839,120	7,916	148,966	619,872	14,864,798	16,745,168	1,880,370	89%
2040	0	23	61,302	14,864,798	1,073,945	3,409	1,801,204	5,533	150,631	688,498	16,433,310	16,433,310	0	100%
2041	0	22	41,350	16,433,310	1,079,199	3,430	21,092	3,750	0	715,961	16,091,483	16,091,483	0	100%
2042	0	22	27,541	16,091,483	1,079,056	3,449	15,197	2,515	0	700,423	15,727,112	15,727,112	0	100%
2043	0	22	17,786	15,727,112	1,074,943	3,463	11,020	1,631	0	684,004	15,345,361	15,345,361	0	100%
2044	0	21	8,700	15,345,361	1,069,138	3,474	7,159	803	0	666,850	14,947,561	14,947,561	0	100%
2045	0	20	3,099	14,947,561	1,059,690	3,480	4,798	294	0	649,095	14,538,579	14,538,579	0	100%
2046	0	20	2,103	14,538,579	1,046,018	3,481	4,372	200	0	630,984	14,124,636	14,124,636	0	100%
2047	0	19	857	14,124,636	1,031,502	3,477	3,839	81	0	612,665	13,706,242	13,706,242	0	100%
2048	0	19	0	13,706,242	1,015,693	3,468	3,468	0	0	594,179	13,284,728	13,284,728	0	100%
2049	0	18	0	13,284,728	998,337	3,453	3,453	0	0	575,597	12,861,988	12,861,988	0	100%
2050	0	18	0	12,861,988	980,113	3,433	3,434	0	0	556,980	12,438,855	12,438,855	0	100%
2051	0	17	0	12,438,855	961,122	3,408	3,407	0	0	538,361	12,016,094	12,016,094	0	100%
2052	0	16	0	12,016,094	941,485	3,377	3,377	0	0	519,774	11,594,383	11,594,383	0	100%
2053	0	16	0	11,594,383	921,334	3,341	3,341	0	0	501,245	11,174,294	11,174,294	0	100%
2054	0	15	0	11,174,294	900,794	3,302	3,302	0	0	482,798	10,756,298	10,756,298	0	100%
2055	0	14	0	10,756,298	879,999	3,259	3,259	0	0	464,451	10,340,750	10,340,750	0	100%
2056	0	14	0	10,340,750	859,085	3,214	3,214	0	0	446,217	9,927,882	9,927,882	0	100%
2057	0	13	0	9,927,882	838,162	3,167	3,166	0	0	428,104	9,517,823	9,517,823	0	100%

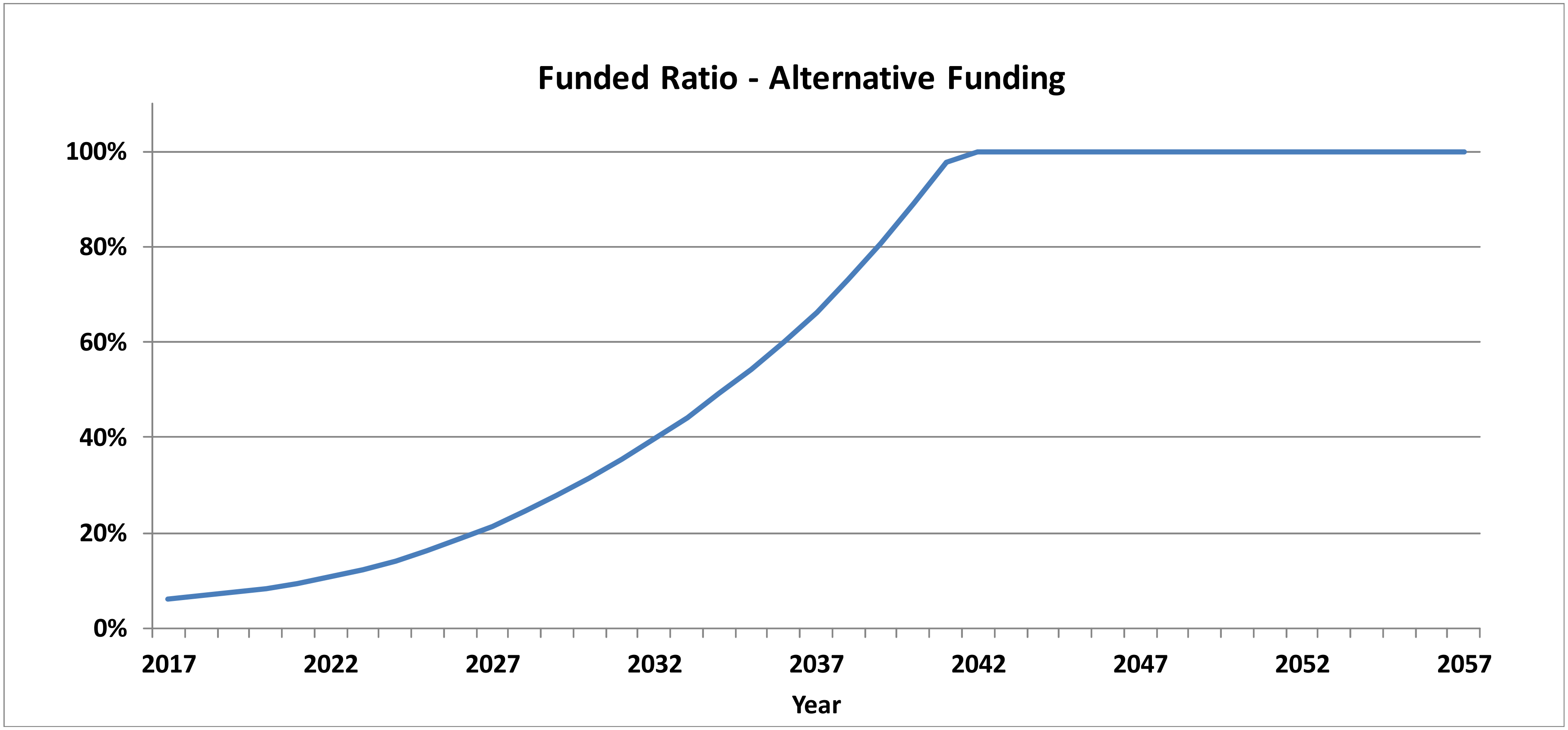
Alternative Funding on an Open Group Basis, Table 2

Valuation Plan Year End 30-Jun	Number Active	Number Pay Status	Total Payroll	Total Assets: Assets (boy)	Benefit Payments	Expenses	Employer Contributions	Employee Contributions	Premium Tax Allocation Contributions	Investment Income	Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
2017	10	23	$619,269	$682,046	$544,127	$6,357	$415,114	$57,782	$148,389	$52,616	$805,463	$13,254,546	$12,449,083	6%
2018	10	23	470,997	805,463	578,698	2,624	444,172	39,716	165,524	37,761	911,314	13,509,868	12,598,554	7%
2019	10	23	495,101	911,314	599,350	2,679	475,264	41,981	158,206	42,643	1,027,379	13,768,377	12,740,998	7%
2020	10	22	521,210	1,027,379	626,308	2,736	508,532	44,345	162,354	48,150	1,161,716	14,024,616	12,862,900	8%
2021	10	22	548,877	1,161,716	629,482	2,793	544,129	46,825	165,553	55,041	1,340,990	14,303,697	12,962,707	9%
2022	10	22	577,357	1,340,990	633,856	2,851	582,218	49,374	168,755	63,986	1,568,616	14,605,962	13,037,346	11%
2023	10	22	594,449	1,568,616	648,279	2,911	622,973	51,038	172,021	74,923	1,838,381	14,915,778	13,077,397	12%
2024	10	22	623,002	1,838,381	664,289	3,006	666,581	53,986	176,529	87,841	2,156,023	15,237,859	13,081,836	14%
2025	10	22	653,936	2,156,023	674,052	3,082	713,242	56,871	180,463	103,106	2,532,571	15,580,448	13,047,877	16%
2026	10	22	686,256	2,532,571	679,873	3,156	763,169	59,892	184,343	121,183	2,978,130	15,949,446	12,971,316	19%
2027	10	22	720,056	2,978,130	685,219	3,230	816,591	63,043	188,403	142,462	3,500,180	16,347,298	12,847,118	21%
2028	10	22	755,544	3,500,180	689,278	3,306	873,752	66,346	192,630	167,303	4,107,627	16,777,547	12,669,920	24%
2029	10	22	777,815	4,107,627	700,668	3,382	934,915	68,612	196,981	195,891	4,799,976	17,226,269	12,426,293	28%
2030	10	22	796,767	4,799,976	726,824	3,494	1,000,359	71,008	202,451	228,093	5,571,569	17,676,615	12,105,046	32%
2031	10	22	813,939	5,571,569	759,800	3,618	1,070,384	73,363	208,441	263,822	6,424,161	18,121,029	11,696,868	35%
2032	10	23	829,992	6,424,161	799,176	3,752	1,145,311	75,731	214,884	303,173	7,360,333	18,552,159	11,191,826	40%
2033	10	23	845,107	7,360,333	839,476	3,891	1,225,483	77,880	221,798	346,386	8,388,513	18,967,610	10,579,097	44%
2034	10	23	846,628	8,388,513	897,749	4,035	1,311,267	78,948	228,950	393,447	9,499,341	19,343,731	9,844,390	49%
2035	10	23	874,267	9,499,341	952,608	4,211	1,403,056	82,698	237,716	444,530	10,710,522	19,697,301	8,986,779	54%
2036	10	24	897,845	10,710,522	986,677	4,334	1,501,270	85,401	244,715	500,673	12,051,570	20,044,575	7,993,005	60%
2037	10	24	912,864	12,051,570	1,028,668	4,466	1,606,359	87,250	252,099	562,627	13,526,771	20,371,953	6,845,182	66%
2038	10	24	943,732	13,526,771	1,064,836	4,610	1,718,804	90,518	260,314	630,961	15,157,922	20,692,491	5,534,569	73%
2039	10	23	981,850	15,157,922	1,086,082	4,724	1,839,120	94,281	267,498	706,809	16,974,824	21,024,390	4,049,566	81%
2040	10	23	1,023,353	16,974,824	1,101,781	4,827	1,967,858	98,382	274,409	791,328	19,000,194	21,375,677	2,375,483	89%
2041	10	23	1,069,638	19,000,194	1,112,723	4,923	2,105,608	102,784	281,137	885,536	21,257,613	21,754,740	497,127	98%
2042	10	23	1,118,119	21,257,613	1,119,315	5,012	683,444	107,177	287,655	955,568	22,167,130	22,167,130	0	100%
2043	10	22	1,168,007	22,167,130	1,124,256	5,099	480,854	111,811	0	985,579	22,616,018	22,616,018	0	100%
2044	10	22	1,218,338	22,616,018	1,130,490	5,186	499,072	116,573	0	1,006,149	23,102,136	23,102,136	0	100%
2045	10	22	1,274,056	23,102,136	1,135,826	5,275	520,144	121,866	0	1,028,490	23,631,535	23,631,535	0	100%
2046	10	21	1,332,407	23,631,535	1,139,076	5,357	542,592	127,189	0	1,052,857	24,209,741	24,209,741	0	100%
2047	10	21	1,389,810	24,209,741	1,143,556	5,438	563,393	132,481	0	1,079,356	24,835,976	24,835,976	0	100%
2048	10	20	1,450,450	24,835,976	1,149,998	5,523	585,754	138,175	0	1,108,015	25,512,399	25,512,399	0	100%
2049	10	20	1,512,022	25,512,399	1,157,884	5,605	609,815	143,809	0	1,138,938	26,241,472	26,241,472	0	100%
2050	10	20	1,575,109	26,241,472	1,166,732	5,688	633,567	149,554	0	1,172,204	27,024,377	27,024,377	0	100%
2051	10	19	1,638,699	27,024,377	1,177,527	5,773	657,117	155,298	0	1,207,844	27,861,335	27,861,335	0	100%
2052	10	19	1,703,792	27,861,335	1,190,737	5,862	681,125	160,959	0	1,245,871	28,752,690	28,752,690	0	100%
2053	10	19	1,767,265	28,752,690	1,206,755	5,954	702,679	166,153	0	1,286,219	29,695,031	29,695,031	0	100%
2054	10	18	1,829,294	29,695,031	1,227,716	6,056	721,851	171,438	0	1,328,699	30,683,247	30,683,247	0	100%
2055	10	18	1,892,472	30,683,247	1,255,149	6,167	741,608	176,916	0	1,373,118	31,713,573	31,713,573	0	100%
2056	10	18	1,955,728	31,713,573	1,288,896	6,286	762,572	182,319	0	1,419,316	32,782,599	32,782,599	0	100%
2057	10	18	2,019,653	32,782,599	1,327,967	6,414	783,673	187,742	0	1,467,140	33,886,772	33,886,772	0	100%

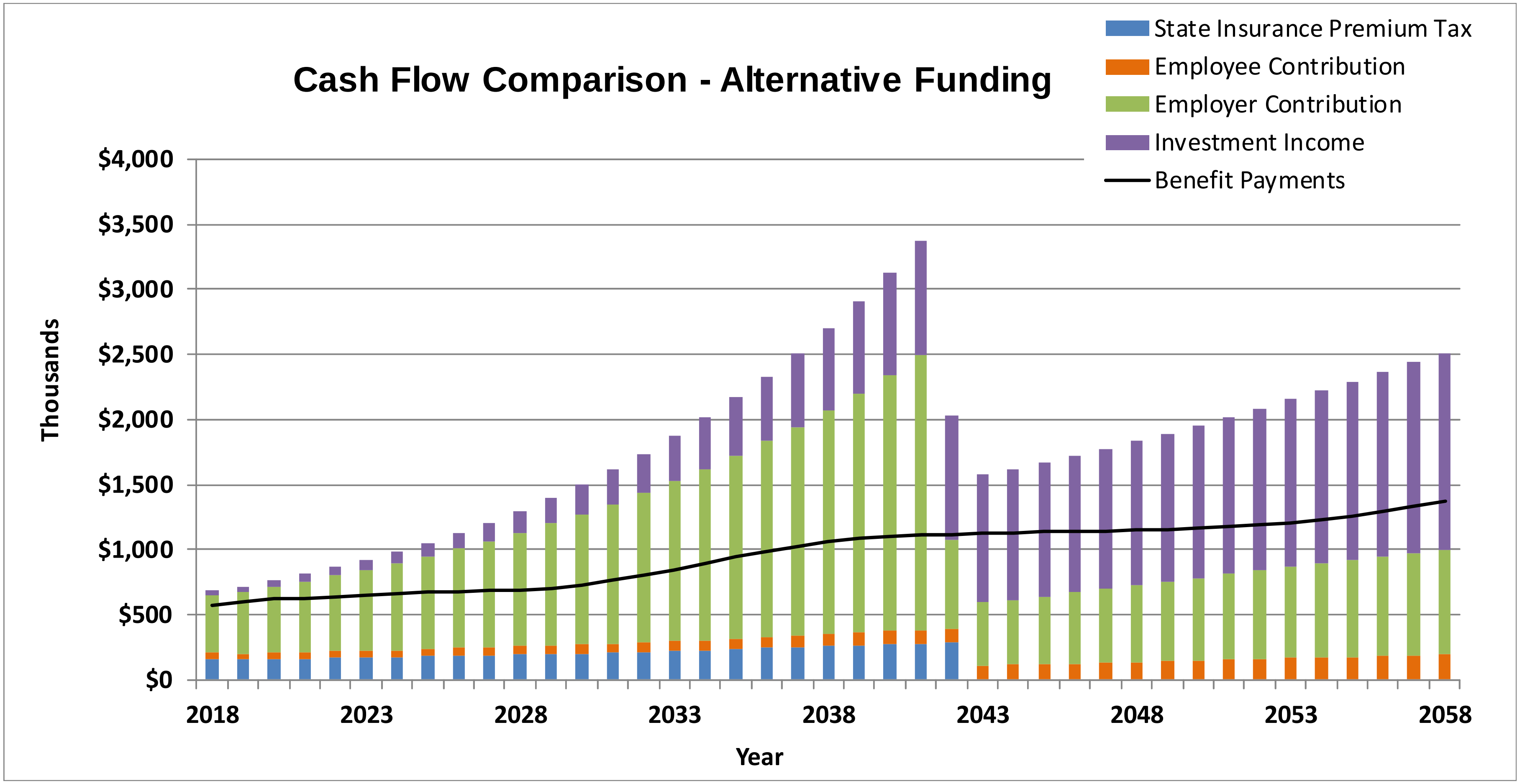
Open Group Actuarial Projections – Alternative Funding, Graph 2



Open Group Actuarial Projections – Alternative Funding, Graph 3



Open Group Actuarial Projections – Alternative Funding, Graph 4



SECTION III

FUNDING POLICY CHOICES

Actuarial Projections –Alternative/Optional/Conservation Funding

Funding Policy Choices

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

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

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

- Employee contributions of 8.5% of pay.

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

- Employer contributions equal to the normal cost, net of employee contributions, plus a 40-year closed period amortization from January 1, 2010, on a level dollar basis, of the unfunded actuarial accrued liability net of premium tax allocation applicable to the plan year.

- Employee contributions of 7% of pay if hired before January 1, 2010, which may be increased by up to 2.5% of pay if elected by the Board of trustees of the Plan. Employees hired after January 1, 2010, contribute 9.50% of pay.

- The premium tax allocation assigned to the Fund for the plan year.

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

- The first asset account (Benefit Payment Account) is used to finance benefits and expenses for the fiscal year on a pay-as-you-go basis. Sources to pay current year benefits and expenses include active member employee contributions of 6.5% (which is the current contribution rate of 8.0% of pay, less 1.5% which by law goes into the accumulation account), a portion of the premium tax allocation not assigned to the accumulation account as defined below, and employer contributions.

- The second account (Accumulation Account) cannot be used to pay benefits and expenses until assets exceed actuarial accrued liabilities. Contributions to the accumulation account include employee contributions of 1.5% of pay and a percentage of the premium tax allocation. The percentage of premium tax allocation is based on the amounts needed to produce 100% funding of liabilities in 35 years, from adoption, considering assets from both the benefit payment account and the accumulation account. This account also includes the Fund's assets prior to the adoption of Conservation funding policy.

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

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

- Scenario I – The sponsor elects either the Optional funding policy or Conservation funding policy during fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.

- Scenario II – The sponsor elects either the Optional funding policy or the Conservation funding policy at some future date when/if contributions are projected to be less than under the current Alternative funding policy.

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

Given that the funded ratio as of June 30, 2017 is only 6%, and that the ratio of assets to expected benefits for the year is only 1.39, we strongly recommend that the sponsor make additional contributions in excess of the statutory minimum under either the Alternative or Conservation funding policy.

<u>Scenario I – Sponsor Immediately Elects either the Optional or Conservation Funding Policy</u>

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	$475,264	96.0%	NA	NA
Optional	$769,960	159.7%	$1,372	10.5%
Conservation	$474,955	98.5%	$1,372	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 $444,172 in fiscal year end 2018 to $2,105,608 in fiscal year end 2041. In fiscal year end 2042, the plan is projected to be 100% 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 $475,264 to $769,960. However, over the 40-year projection period, total employer contributions to both the local plan and the statewide plan are projected to decrease from $771,332 in fiscal year end 2019 to $543,387 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 decrease from $475,264 to $474,955. During the 35-year projection period, total employer contributions to both the local plan and the statewide plan are projected to increase from $476,326 in fiscal year end 2019 to $932,157 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 until 2036 when compared to the Optional funding policy. The Alternative funding policy produces a higher funded ratio when compared to the Conservation funding policy. However, 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

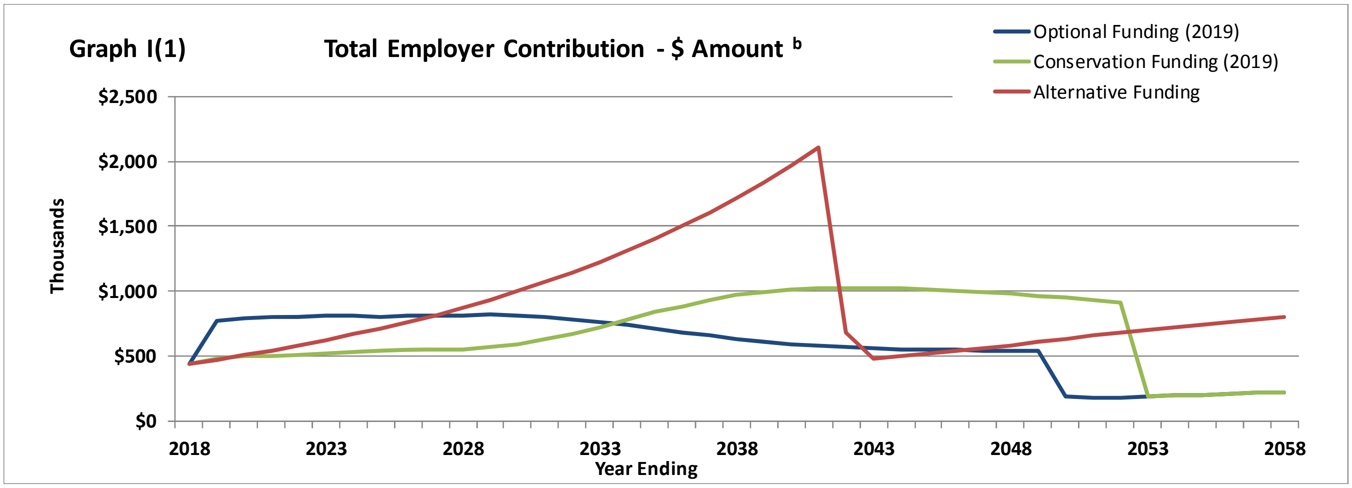
Under Scenario II, the plan sponsor is assumed to make contributions under the Alternative funding policy in future years, until the first year that either the Optional or Conservation policy produces a lower contribution. Under this assumption, in plan year end 2031, the employer contributions under the Optional funding policy of $1,054,348 are projected to be lower than contributions under the Alternative funding policy of $1,070,384. Similarly, in plan year end 2020, the employer contributions under the Conservation funding policy of $490,345 are projected to be lower than contributions under the Alternative funding policy of $508,532.

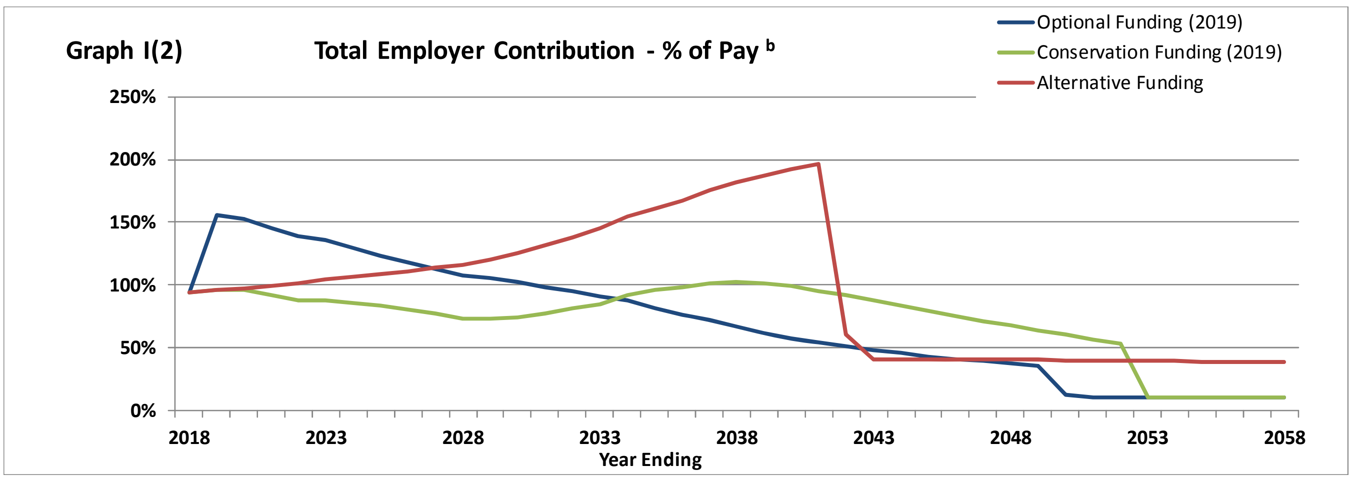
Graphs II(1), II(2), and III(3) show the projected contribution pattern and funded ratio. Based on these projections, electing the Optional funding policy in 2031 appears to produce a relatively stable and actuarially sound contribution pattern as compared to either the Alternative funding policy or the Conservation funding policy. The Conservation funding policy has lower projected employer contributions than the Alternative funding policy beginning in 2020. After 2020, the funded ratio under the Conservation funding policy increases at a lower rate than the Alternative funding policy. As stated above, however, the Conservation funding policy is dependent on expected benefits payments when considering the *expected number of retirement and disabilities.* The ultimate employer contributions depend on the *actual number of retirement and disabilities*, which could result in a more volatile contribution pattern when compared to the Optional funding policy.

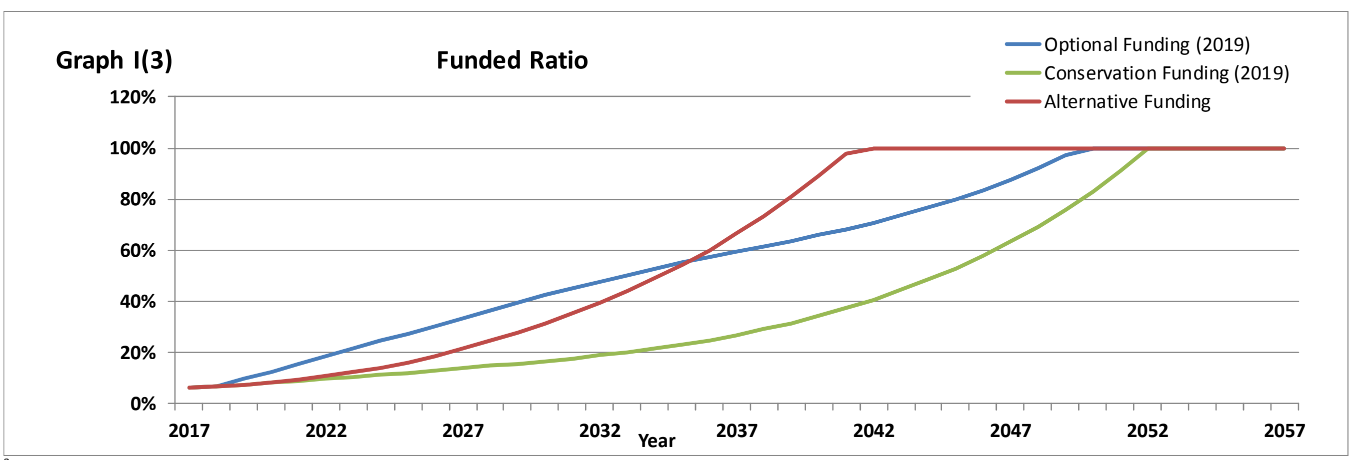
The details of the Scenario II projections can be found in the Appendix.

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

Scenario I



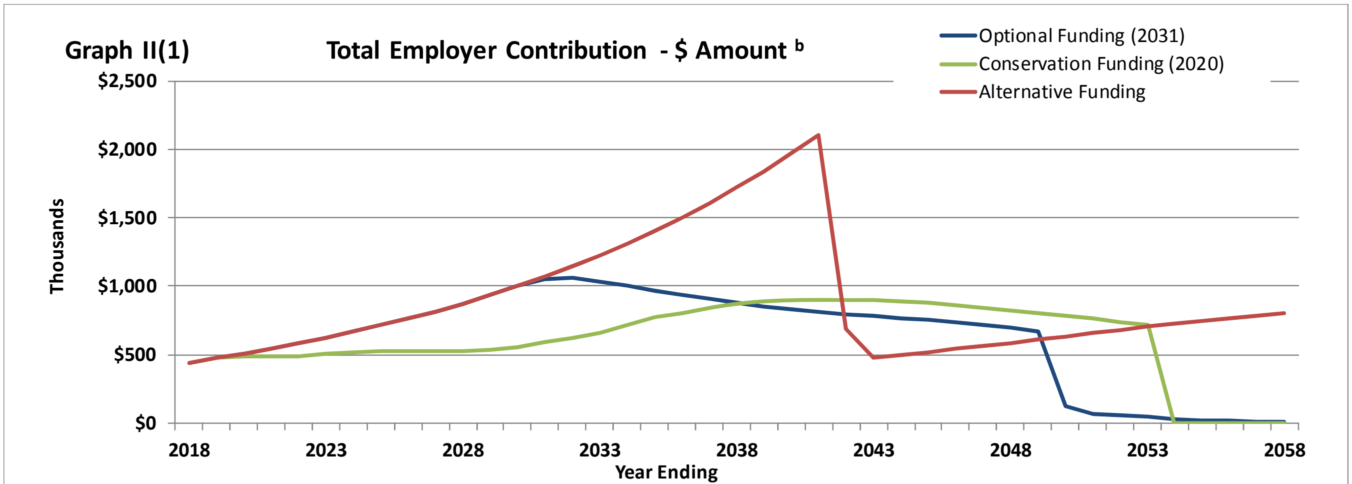


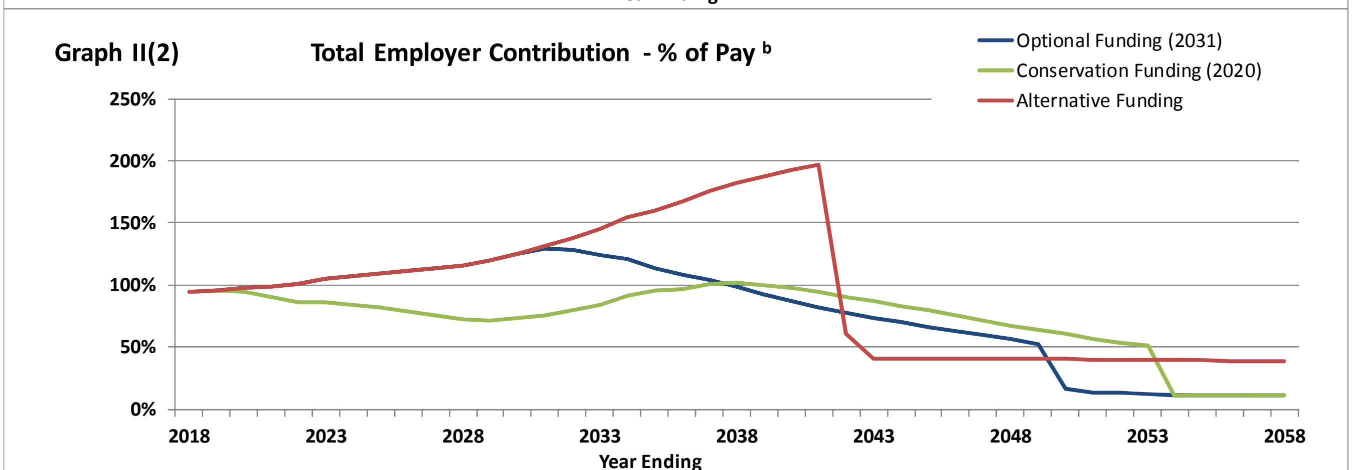


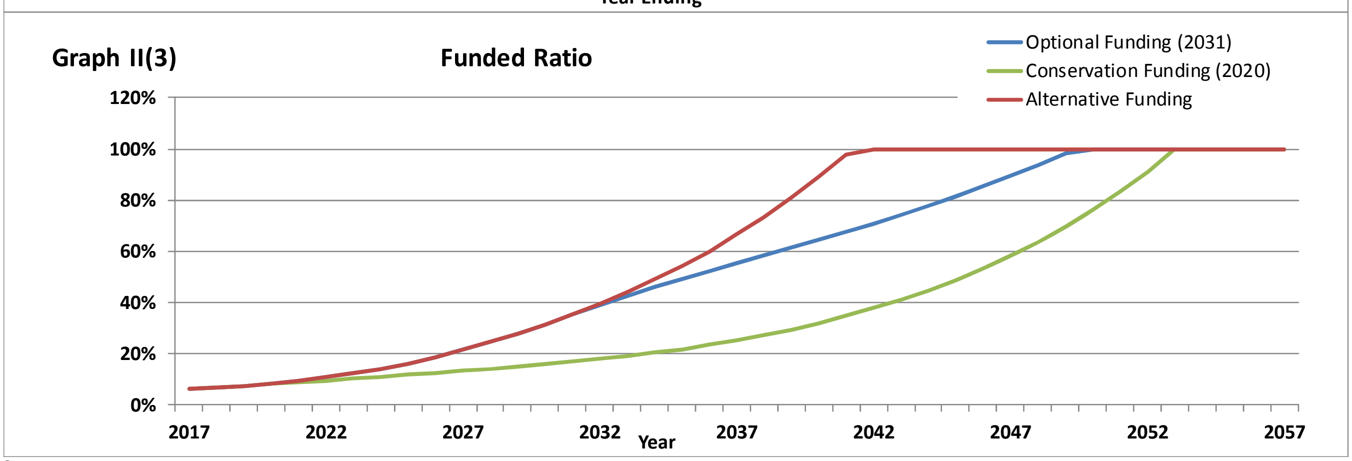
[a] *Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.*
[b] *Based on total pay and includes contributions for future members projected to participate in the statewide plan.*

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

Scenario II







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

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

SECTION IV

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

Actuarially Determined Contribution for GASB Statement Nos. 67 and 68 Reporting
Schedule C: Funding Progress and Employer Contributions

Valuation Date	**July 1, 2016**	**July 1, 2017**
Valuation Interest Rate	4.50%	4.50%
Cost-of-Living Adjustment	2.75%	2.75%
Wage Inflation	3.75%	3.75%
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	$682,046	$805,463
2. Actuarial Accrued Liability	$12,913,188	$13,254,546
3. Unfunded Actuarial Accrued Liability (2 - 1)	$12,231,142	$12,449,083
4. Funded Ratio (1/2)	5%	6%
5. Expected Payroll	$619,269	$470,997
6. UAAL as Percentage of Covered Payroll (3/5)	1,975%	2,643%
Schedule of Employer Contributions [c]	**FYE 2017**	**FYE 2018**
1. Actuarially Determined Contribution		
(a) Employer Normal Cost	$271,862	$207,874
(b) Amortization of Unfunded Actuarial Accrued Liability	$552,956	$585,226
(c) Actuarially Determined Contribution (ADC) (a + b)	$824,818	$793,100
2. Employer Contribution [b]	$415,114	$444,172
3. Premium Tax Allocation	$148,389	$165,524
4. Percentage of ADC Contributed [(2 + 3)/1(c)]	68%	77%

[a] *Suggested amortization policy to comply with GASB Statement Nos. 67 and 68 Standards.*
[b] *Estimated employer contribution for fiscal year end June 30, 2018.*
[c] *The Alternative minimum contribution plus the premium tax allocation does not satisfy the Actuarially Determined Contribution as defined by GASB Statement Nos. 67 and 68.*

SECTION V

ACTUARIAL VALUATION DATA AS OF JULY 1, 2017

Actuarial Valuation Data as of July 1, 2017
Schedule D: Reconciliation of Assets

Plan Year Ending	June 30, 2016	June 30, 2017
A. Market Value of Assets Beginning of Year	$629,458	$682,046
Adjustment to Market Value of Assets at Beginning of Year	$0	$0
Market Value of Assets Beginning of Year	$629,458	$682,046
1. Revenue During Fiscal Year		
(a) Employee Contribution	$52,073	$57,782
(b) Governmental Contribution		
(i) From Local Government	$387,957	$415,114
(ii) From State Government	$153,340	$148,389
(iii) Reallocation from State Government	$0	$0
(iv) Total	$541,297	$563,503
(c) Earnings on Investments		
(i) Net Appreciation/(Depreciation)	($52)	$0
(ii) Bond Interest	$63	$261
(iii) Dividends	$11,655	$16,324
(iv) Net Realized Gain (Loss) on Sale/Exchange	($8,540)	$33,105
(v) Other	$830	$0
(vi) Less Investment Expense	$0	$0
(vii) Total	$3,956	$49,690
(d) Other Revenue	$0	$2,926
(e) Net Receivable Investment Income	$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))	$597,326	$673,901
2. Expenditures During Fiscal Year		
(a) Benefits Paid	$539,514	$536,455
(b) Withdrawals	$0	$7,672
(c) Administrative Expenses	$5,224	$0
(d) Payable Benefits and Withdrawals	$0	$0
(e) Payable Administrative Expenses	$0	$6,357
(f) Total Expenditures (sum of (a) through (e))	$544,738	$550,484
B. Market Value of Assets End of Year [A + 1(g) - 2(f)]	$682,046	$805,463
C. Approximate Return on Assets	(0.19)%	7.33%

[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	$223,808	33%	$149,263	19%
2. Government Securities				
(a) US Treasury Bills, Notes and Bonds	$0		$0	
(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%	$0	0%
3. Corporate Fixed Income				
(a) US Bonds	$0		$0	
(b) US Mortgage or other Asset Backed Securities	$0		$0	
(c) US Mutual Fund Shares (Bonds)	$149,611		$398,511	
(d) US Exchange Traded Funds (Bonds)	$0		$0	
(e) International Bonds	$0		$0	
(f) International Mutual Fund Shares (Bonds)	$101,653		$0	
(g) International Exchange Traded Funds (Bonds)	$28,001		$0	
(h) Total Corporate Fixed Income (sum of (a) through (g))	$279,265	41%	$398,511	49%
4. Corporate Equity				
(a) US Equity	$0		$0	
(b) US Mutual Fund Shares (Equity)	$9,963		$178,265	
(c) US Exchange Traded Funds (Equity)	$144,350		$0	
(d) International Equity	$0		$0	
(e) International Mutual Fund Shares (Equity)	$24,660		$79,424	
(f) International Exchange Traded Funds (Equity)	$0		$0	
(g) Total Corporate Equity (sum of (a) through (f))	$178,973	26%	$257,689	32%
5. Alternative Investments				
(a) Real Estate Investment Trust	$0		$0	
(b) Private Equity Fund	$0		$0	
(c) Hedge Funds	$0		$0	
(d) Other Alternative Investments	$0		$0	
(e) Total Alternative Investments (sum of (a) through (d))	$0	0%	$0	0%
6. Other	$0	0%	$0	0%
7. Receivable Contributions	$0			
(a) From Employee Contributions	$0		$0	
(b) From Local Government	$0		$0	
(c) From State Government	$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 [sum of (1) through (8)]	**$682,046**		**$805,463**	

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:	**13**	**14**	**4**	**0**	**3**	**34**
New Actives:						**0**
Returned to Actives Status:						**0**
Data Corrections/Other Changes:						**0**
Vested Terminations:						**0**
Non-Vested Terminations:	(1)					**(1)**
Disabled:						**0**
Retirements:	(2)	3	(1)			**0**
Deaths with Beneficiary:						**0**
Deaths w/o Beneficiary:						**0**
Expired Annuity or Stop Payment:						**0**
Net Changes:	(3)	3	(1)	0	0	**(1)**
Total Participants June 30, 2017:	**10**	**17**	**3**	**0**	**3**	**33**

Actuarial Valuation Data as of July 1, 2017
Schedule G: Distribution of Active Employees by Age and Length of Service

Attained Age	Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 35	Totals	Valuation Payroll[a]
Under 20											$ 0
20-24											$ 0
25-29											$ 0
30-34		2	1	2						5	$ 224,199
35-39			2	2						4	$ 192,236
40-44						1				1	$ 49,021
45-49											$ 0
50-54											$ 0
55-59											$ 0
60-64											$ 0
65-69											$ 0
Over 70											$ 0
Totals	0	2	3	4	0	1	0	0	0	10	$ 465,456

Averages

Age:	35.8	years
Service:	9.3	years
Annual Pay:	$46,546	[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	13	10
Total Annual Pay	$612,395	$465,456
Average Age	36.5	35.8
Average Service	9.8	9.3

Inactive Participants	July 1, 2016		July 1, 2017	
Type	No.	Annual Benefit	No.	Annual Benefit
Retirees	14	$397,256	17	$498,256
Survivors	3	$44,728	3	$45,259
Disabled Members	4	$95,790	3	$69,726
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%

[1] Funded 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).
[2] Liquidity ratio equals assets as of the actuarial valuation date divided by expected benefit payments for the year.
[3] Based on investment policy.

As of June 30, 2017	
Assets	$805,463
Liabilities using a 5.50% discount rate	$11,505,647
Funded Ratio	7%
Expected Benefit Payments	$578,698
Liquidity Ratio	1.39
Equity Exposure	32%
Projected Funded Ratio after 15 years	49%

Discount Rate	4.50%

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 Dunbar Firemen's Pension and Relief Fund reported 14 eligible active members and 21 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 \$158,206 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% *plus* Wage Inflation Increment: 1.00% *plus*
Service-based Increase:	Years of Service — Increase 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
Amortization Policies:	
Alternative Plans and former Alternative Plans that selected the Conservation Policy	For GASB 67/68 Accounting: 30 – Year Closed Level-Percentage-of-Pay Amortization (from July 1, 2010 – 23 years remaining as of July 1, 2017).
Standard Plans and former Standard Plans that selected the Optional Policy	For funding and GASB 67/68 Accounting: 40-Year Closed Level-Dollar Amortization (from July 1, 1991 – 14 years remaining as of July 1, 2017)
Former Alternative Plans that selected the Optional Policy	For funding: 40-Year Closed Level-Dollar Amortization (from January 1, 2010 – 32.5 years remaining as of July 1, 2017). For GASB 67/68 Accounting: 30-Year Closed Level-Percentage-of-Pay Amortization (from July 1, 2010 – 23 years remaining as of July 1, 2017)

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

Asset Method	Market Value
Turnover	Sample Rates – Age / Rates 25 / 9% 35 / 4% 45 / 2% 50 / 0%
Retirement	Age / Rates[a] 50 / 45% 51-55 / 30% 56-59 / 35% 60 / 100% [a]*Terminated vested participants are assumed to retire at age 50.*
Mortality	Active: RP-2014 Blue Collar Healthy Employee[b] Post-Retirement: RP-2014 Blue Collar Healthy Annuitant Disabled: RP-2014 Blue Collar Healthy Annuitant set forward four years Tables above incorporate generational mortality improvement using MP-2014 2-dimensional mortality improvement scales [b]*Assumes 10% of deaths are duty-related and 90% are non-duty related.*
Disability	Sample Rates – Age / Rates[c] 30 / 0.22% 40 / 0.50% 50 / 0.79% [c] *Assumes 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.*
Percent Married	90%
Spouse Age	Females 3 years younger than males

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	Open group projections assume: (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. Closed group projections are the same as the open group projections except active members who retire, become disabled, die, or terminate are not replaced with new entrants.
Decrement Timing	Mid-Year

SECTION VII

SUMMARY OF PRINCIPAL PLAN PROVISIONS

Summary of Principal Plan Provisions
Actuarial Valuation as of July 1, 2017

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

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

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

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

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

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

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

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

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

Contributions — Participating employees contribute 8.0% 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.

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 Active	Number Pay Status	Total Assets: Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Premium Tax Allocation Contribs.	Investment Income	Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
2017	10	23	$682,046	$544,127	$6,357	$415,114	$57,782	$148,389	$52,616	$805,463	$13,254,546	$12,449,083	6%
2018	10	23	805,463	578,698	2,624	444,172	39,716	165,524	37,761	911,314	13,509,868	12,598,554	7%
2019	9	23	911,314	599,350	2,648	769,960	40,643	158,206	49,171	1,327,296	13,761,636	12,434,340	10%
2020	9	22	1,327,296	626,260	2,676	789,926	41,655	162,354	67,850	1,760,146	14,003,660	12,243,514	13%
2021	9	22	1,760,146	629,291	2,706	793,599	42,809	165,553	87,439	2,217,549	14,260,829	12,043,280	16%
2022	9	22	2,217,549	633,456	2,740	796,896	44,051	168,755	108,101	2,699,156	14,533,298	11,834,142	19%
2023	8	22	2,699,156	647,617	2,774	800,529	44,328	172,021	129,617	3,195,259	14,804,726	11,609,467	22%
2024	8	22	3,195,259	663,313	2,810	797,489	44,238	176,529	151,623	3,699,016	15,071,183	11,372,167	25%
2025	7	22	3,699,016	672,647	2,847	792,577	44,910	180,463	174,076	4,215,548	15,343,903	11,128,355	27%
2026	7	22	4,215,548	677,901	2,885	791,792	45,752	184,343	197,290	4,753,940	15,628,596	10,874,656	30%
2027	7	22	4,753,940	682,624	2,925	792,064	46,718	188,403	221,529	5,317,105	15,927,136	10,610,031	33%
2028	7	22	5,317,105	685,997	2,967	792,951	47,790	192,630	246,933	5,908,445	16,242,225	10,333,780	36%
2029	6	22	5,908,445	696,658	3,010	794,363	47,754	196,981	273,433	6,521,308	16,558,947	10,037,639	39%
2030	5	22	6,521,308	722,031	3,053	787,780	46,050	202,451	300,384	7,132,889	16,850,700	9,717,811	42%
2031	5	22	7,132,889	754,070	3,095	770,464	43,455	208,441	326,882	7,724,965	17,104,060	9,379,095	45%
2032	4	22	7,724,965	792,284	3,137	747,396	40,158	214,884	352,231	8,284,213	17,306,435	9,022,222	48%
2033	3	23	8,284,213	831,168	3,177	719,646	36,041	221,798	375,975	8,803,327	17,450,672	8,647,345	50%
2034	3	23	8,803,327	887,771	3,217	688,059	30,284	228,950	397,403	9,257,036	17,508,418	8,251,382	53%
2035	2	23	9,257,036	940,684	3,255	648,592	25,229	237,716	415,846	9,640,480	17,484,498	7,844,018	55%
2036	2	23	9,640,480	972,402	3,291	614,356	21,338	244,715	431,702	9,976,897	17,403,375	7,426,478	57%
2037	1	24	9,976,897	1,011,742	3,325	585,133	15,924	252,099	445,358	10,260,343	17,246,202	6,985,859	59%
2038	1	23	10,260,343	1,045,013	3,356	548,677	11,025	260,314	456,634	10,488,624	17,019,151	6,530,527	62%
2039	0	23	10,488,624	1,062,836	3,384	515,247	7,916	267,498	465,856	10,678,922	16,745,168	6,066,246	64%
2040	0	23	10,678,922	1,073,945	3,409	490,412	5,533	274,409	473,720	10,845,643	16,433,310	5,587,667	66%
2041	0	22	10,845,643	1,079,199	3,430	470,037	3,750	281,137	480,761	10,998,699	16,091,483	5,092,784	68%
2042	0	22	10,998,699	1,079,056	3,449	453,194	2,515	287,655	487,394	11,146,952	15,727,112	4,580,160	71%
2043	0	22	11,146,952	1,074,943	3,463	439,413	1,631	294,046	493,973	11,297,608	15,345,361	4,047,753	74%
2044	0	21	11,297,608	1,069,138	3,474	427,568	803	300,541	500,744	11,454,652	14,947,561	3,492,909	77%
2045	0	20	11,454,652	1,059,690	3,480	416,284	294	306,994	507,903	11,622,958	14,538,579	2,915,621	80%
2046	0	20	11,622,958	1,046,018	3,481	406,660	200	313,237	515,703	11,809,259	14,124,636	2,315,377	84%
2047	0	19	11,809,259	1,031,502	3,477	399,160	81	319,471	524,379	12,017,371	13,706,242	1,688,871	88%
2048	0	19	12,017,371	1,015,693	3,468	391,758	0	325,942	534,073	12,249,983	13,284,728	1,034,745	92%
2049	0	18	12,249,983	998,337	3,453	384,625	0	332,300	544,911	12,510,028	12,861,988	351,960	97%
2050	0	18	12,510,028	980,113	3,433	24,405	0	338,820	549,148	12,438,855	12,438,855	0	100%
2051	0	17	12,438,855	961,122	3,408	3,407	0	0	538,361	12,016,094	12,016,094	0	100%
2052	0	16	12,016,094	941,485	3,377	3,377	0	0	519,774	11,594,383	11,594,383	0	100%
2053	0	16	11,594,383	921,334	3,341	3,341	0	0	501,245	11,174,294	11,174,294	0	100%
2054	0	15	11,174,294	900,794	3,302	3,302	0	0	482,798	10,756,298	10,756,298	0	100%
2055	0	14	10,756,298	879,999	3,259	3,259	0	0	464,451	10,340,750	10,340,750	0	100%
2056	0	14	10,340,750	859,085	3,214	3,214	0	0	446,217	9,927,883	9,927,882	0	100%
2057	0	13	9,927,883	838,162	3,167	3,166	0	0	428,104	9,517,823	9,517,823	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	$470,997	$0	$470,997	$39,716	$244,966	$205,250	$720,292	$158,206	$562,086	$2,624	$769,960	$0
2019	482,039	13,063	495,101	40,643	250,875	210,232	739,400	162,354	577,046	2,648	789,926	1,372
2020	494,121	27,090	521,210	41,655	257,260	215,605	740,872	165,553	575,319	2,676	793,599	2,844
2021	507,870	41,007	548,877	42,809	264,459	221,650	741,295	168,755	572,540	2,706	796,896	4,306
2022	522,647	54,710	577,357	44,051	272,160	228,109	741,701	172,021	569,680	2,740	800,529	5,745
2023	525,296	69,153	594,449	44,328	273,424	229,096	742,148	176,529	565,619	2,774	797,489	7,261
2024	523,293	99,709	623,002	44,238	272,228	227,990	742,241	180,463	561,778	2,810	792,577	10,469
2025	530,735	123,202	653,936	44,910	276,021	231,111	742,177	184,343	557,834	2,847	791,792	12,936
2026	540,320	145,936	686,256	45,752	280,949	235,197	742,386	188,403	553,983	2,885	792,064	15,323
2027	551,450	168,606	720,056	46,718	286,684	239,966	742,689	192,630	550,059	2,925	792,951	17,704
2028	563,899	191,645	755,544	47,790	293,111	245,321	743,055	196,981	546,074	2,967	794,363	20,123
2029	562,487	215,327	777,815	47,754	291,496	243,742	743,479	202,451	541,028	3,010	787,780	22,609
2030	540,205	256,562	796,767	46,050	278,507	232,457	743,395	208,441	534,954	3,053	770,464	26,939
2031	506,769	307,171	813,939	43,455	260,130	216,675	742,510	214,884	527,626	3,095	747,396	32,253
2032	464,555	365,436	829,992	40,158	237,298	197,140	741,167	221,798	519,369	3,137	719,646	38,371
2033	415,063	430,044	845,107	36,041	210,449	174,408	739,424	228,950	510,474	3,177	688,059	45,155
2034	346,178	500,450	846,628	30,284	176,083	145,799	737,293	237,716	499,577	3,217	648,592	52,547
2035	283,780	590,486	874,267	25,229	146,547	121,318	734,498	244,715	489,783	3,255	614,356	62,001
2036	237,784	660,061	897,845	21,338	123,377	102,039	731,901	252,099	479,802	3,291	585,133	69,306
2037	177,082	735,782	912,864	15,924	91,884	75,960	729,706	260,314	469,392	3,325	548,677	77,257
2038	122,781	820,951	943,732	11,025	63,710	52,685	726,704	267,498	459,206	3,356	515,247	86,200
2039	87,997	893,853	981,850	7,916	45,623	37,707	723,731	274,409	449,322	3,384	490,412	93,855
2040	61,302	962,051	1,023,353	5,533	31,746	26,213	721,552	281,137	440,415	3,409	470,037	101,015
2041	41,350	1,028,288	1,069,638	3,750	21,413	17,663	719,755	287,655	432,100	3,430	453,194	107,970
2042	27,541	1,090,578	1,118,119	2,515	14,259	11,744	718,266	294,046	424,220	3,449	439,413	114,511
2043	17,786	1,150,221	1,168,007	1,631	9,192	7,561	717,084	300,541	416,543	3,463	427,568	120,773
2044	8,700	1,209,638	1,218,338	803	4,491	3,688	716,116	306,994	409,122	3,474	416,284	127,012
2045	3,099	1,270,958	1,274,056	294	1,608	1,314	715,104	313,237	401,867	3,480	406,660	133,451
2046	2,103	1,330,304	1,332,407	200	1,090	890	714,259	319,471	394,788	3,481	399,160	139,682
2047	857	1,388,952	1,389,810	81	444	363	713,860	325,942	387,918	3,477	391,758	145,840
2048	0	1,450,450	1,450,450	0	0	0	713,457	332,300	381,157	3,468	384,625	152,297
2049	0	1,512,022	1,512,022	0	0	0	712,911	338,820	374,091	3,453	24,405 [b]	158,762
2050	0	1,575,109	1,575,109	0	0	0	0	0	0	3,433	3,407 [b]	165,386
2051	0	1,638,699	1,638,699	0	0	0	0	0	0	3,408	3,377 [b]	172,063
2052	0	1,703,792	1,703,792	0	0	0	0	0	0	3,377	3,341 [b]	178,898
2053	0	1,767,265	1,767,265	0	0	0	0	0	0	3,341	3,302 [b]	185,563
2054	0	1,829,294	1,829,294	0	0	0	0	0	0	3,302	3,259 [b]	192,076
2055	0	1,892,472	1,892,472	0	0	0	0	0	0	3,259	3,214 [b]	198,710
2056	0	1,955,728	1,955,728	0	0	0	0	0	0	3,214	3,166 [b]	205,351
2057	0	2,019,653	2,019,653	0	0	0	0	0	0	3,167	3,119 [b]	212,064

[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										
Plan Year End 30-Jun	Number Active	Number Pay Status	Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Premium Tax Allocation Contribs.	Investment Income	Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
2017	10	23	$682,046	$544,127	$6,357	$415,114	$57,782	$148,389	$52,616	$805,463	$13,254,546	$12,449,083	6%
2018	10	23	805,463	578,698	2,624	444,172	39,716	165,524	37,761	911,314	13,509,868	12,598,554	7%
2019	9	23	911,314	599,350	2,648	474,955	40,643	158,206	42,607	1,025,727	13,761,636	12,735,909	7%
2020	9	22	1,025,727	626,260	2,676	498,607	41,655	162,354	47,797	1,147,204	14,003,660	12,856,456	8%
2021	9	22	1,147,204	629,291	2,706	498,827	42,809	165,553	53,297	1,275,693	14,260,829	12,985,136	9%
2022	9	22	1,275,693	633,456	2,740	500,111	44,051	168,755	59,113	1,411,526	14,533,298	13,121,771	10%
2023	8	22	1,411,526	647,617	2,774	512,135	44,328	172,021	65,256	1,554,875	14,804,726	13,249,851	11%
2024	8	22	1,554,875	663,313	2,810	525,259	44,238	176,529	71,747	1,706,525	15,071,183	13,364,658	11%
2025	7	22	1,706,525	672,647	2,847	531,741	44,910	180,463	78,610	1,866,756	15,343,903	13,477,147	12%
2026	7	22	1,866,756	677,901	2,885	534,039	45,752	184,343	85,859	2,035,963	15,628,596	13,592,633	13%
2027	7	22	2,035,963	682,624	2,925	535,600	46,718	188,403	93,514	2,214,650	15,927,136	13,712,486	14%
2028	7	22	2,214,650	685,997	2,967	535,628	47,790	192,630	101,597	2,403,331	16,242,225	13,838,894	15%
2029	6	22	2,403,331	696,658	3,010	543,772	47,754	196,981	110,127	2,602,296	16,558,947	13,956,651	16%
2030	5	22	2,602,296	722,031	3,053	567,320	46,050	202,451	119,123	2,812,157	16,850,700	14,038,543	17%
2031	5	22	2,812,157	754,070	3,095	597,950	43,455	208,441	128,609	3,033,447	17,104,060	14,070,613	18%
2032	4	22	3,033,447	792,284	3,137	635,056	40,158	214,884	138,612	3,266,736	17,306,435	14,039,699	19%
2033	3	23	3,266,736	831,168	3,177	673,263	36,041	221,798	149,156	3,512,649	17,450,672	13,938,022	20%
2034	3	23	3,512,649	887,771	3,217	730,397	30,284	228,950	160,264	3,771,557	17,508,418	13,736,861	22%
2035	2	23	3,771,557	940,684	3,255	782,279	25,229	237,716	171,974	4,044,816	17,484,498	13,439,682	23%
2036	2	23	4,044,816	972,402	3,291	813,092	21,338	244,715	184,319	4,332,588	17,403,375	13,070,787	25%
2037	1	24	4,332,588	1,011,742	3,325	852,599	15,924	252,099	197,315	4,635,458	17,246,202	12,610,745	27%
2038	1	23	4,635,458	1,045,013	3,356	885,124	11,025	260,314	211,001	4,954,553	17,019,151	12,064,598	29%
2039	0	23	4,954,553	1,062,836	3,384	901,311	7,916	267,498	225,414	5,290,472	16,745,168	11,454,697	32%
2040	0	23	5,290,472	1,073,945	3,409	910,337	5,533	274,409	240,584	5,643,981	16,433,310	10,789,328	34%
2041	0	22	5,643,981	1,079,199	3,430	913,114	3,750	281,137	256,546	6,015,899	16,091,483	10,075,584	37%
2042	0	22	6,015,899	1,079,056	3,449	910,160	2,515	287,655	273,337	6,407,061	15,727,112	9,320,051	41%
2043	0	22	6,407,061	1,074,943	3,463	903,017	1,631	294,046	290,994	6,818,342	15,345,361	8,527,018	44%
2044	0	21	6,818,342	1,069,138	3,474	894,071	803	300,541	309,558	7,250,703	14,947,561	7,696,858	49%
2045	0	20	7,250,703	1,059,690	3,480	881,233	294	306,994	329,071	7,705,126	14,538,579	6,833,453	53%
2046	0	20	7,705,126	1,046,018	3,481	863,948	200	313,237	349,577	8,182,589	14,124,636	5,942,047	58%
2047	0	19	8,182,589	1,031,502	3,477	845,839	81	319,471	371,119	8,684,119	13,706,242	5,022,123	63%
2048	0	19	8,684,119	1,015,693	3,468	826,259	0	325,942	393,746	9,210,905	13,284,728	4,073,823	69%
2049	0	18	9,210,905	998,337	3,453	805,125	0	332,300	417,509	9,764,048	12,861,988	3,097,940	76%
2050	0	18	9,764,048	980,113	3,433	783,022	0	338,820	442,460	10,344,805	12,438,855	2,094,050	83%
2051	0	17	10,344,805	961,122	3,408	760,094	0	345,430	468,654	10,954,453	12,016,094	1,061,641	91%
2052	0	16	10,954,453	941,485	3,377	736,371	0	352,269	496,150	11,594,381	11,594,383	0	100%
2053	0	16	11,594,381	921,334	3,341	3,341	0	0	501,245	11,174,292	11,174,294	0	100%
2054	0	15	11,174,292	900,794	3,302	3,302	0	0	482,798	10,756,298	10,756,298	0	100%
2055	0	14	10,756,298	879,999	3,259	3,259	0	0	464,451	10,340,750	10,340,750	0	100%
2056	0	14	10,340,750	859,085	3,214	3,214	0	0	446,217	9,927,882	9,927,882	0	100%
2057	0	13	9,927,882	838,162	3,167	3,166	0	0	428,104	9,517,823	9,517,823	0	100%

Actuarial Projections – Conservation Funding in 2019
Table A-4

	Benefit Payment Account[a]							Accumulation Account[b]						
Plan Year End 30-Jun	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	6.50% of Pay Employee Contribs.	59.18% of Premium Tax Allocation	Investment Income	Transfer (To)/From Accumulation Account	Assets (boy)[c]	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Employee Contribs.	40.82% of Premium Tax Allocation	Investment Income	Statewide Employer Contribution
2018	$805,463	$581,322	$444,172	$39,716	$165,524	$37,761	$0	$0	$0	$0	$0	$0	$0	$0
2019	911,314	601,998	474,955	33,412	93,631	41,009	(952,323)	952,323	0	0	7,231	64,575	1,598	1,372
2020	0	628,936	498,607	34,243	96,086	0	0	1,025,727	0	0	7,412	66,268	47,797	2,844
2021	0	631,997	498,827	35,191	97,979	0	0	1,147,204	0	0	7,618	67,574	53,297	4,306
2022	0	636,196	500,111	36,211	99,874	0	0	1,275,693	0	0	7,840	68,881	59,113	5,745
2023	0	650,391	512,135	36,449	101,807	0	0	1,411,527	0	0	7,879	70,214	65,256	7,261
2024	0	666,123	525,259	36,389	104,475	0	0	1,554,875	0	0	7,849	72,054	71,747	10,469
2025	0	675,494	531,741	36,949	106,804	0	0	1,706,525	0	0	7,961	73,660	78,610	12,936
2026	0	680,786	534,039	37,647	109,100	0	0	1,866,756	0	0	8,105	75,243	85,859	15,323
2027	0	685,549	535,600	38,446	111,503	0	0	2,035,964	0	0	8,272	76,901	93,514	17,704
2028	0	688,964	535,628	39,332	114,004	0	0	2,214,650	0	0	8,458	78,626	101,597	20,123
2029	0	699,668	543,772	39,317	116,579	0	0	2,403,331	0	0	8,437	80,402	110,127	22,609
2030	0	725,084	567,320	37,947	119,817	0	0	2,602,296	0	0	8,103	82,634	119,123	26,939
2031	0	757,165	597,950	35,853	123,362	0	0	2,812,157	0	0	7,602	85,079	128,609	32,253
2032	0	795,421	635,056	33,190	127,175	0	0	3,033,447	0	0	6,968	87,709	138,612	38,371
2033	0	834,345	673,263	29,815	131,267	0	0	3,266,736	0	0	6,226	90,531	149,156	45,155
2034	0	890,988	730,397	25,091	135,500	0	0	3,512,649	0	0	5,193	93,451	160,264	52,547
2035	0	943,939	782,279	20,972	140,688	0	0	3,771,557	0	0	4,257	97,028	171,974	62,001
2036	0	975,693	813,092	17,771	144,830	0	0	4,044,817	0	0	3,567	99,885	184,319	69,306
2037	0	1,015,067	852,599	13,268	149,200	0	0	4,332,588	0	0	2,656	102,899	197,315	77,257
2038	0	1,048,369	885,124	9,183	154,062	0	0	4,635,458	0	0	1,842	106,252	211,001	86,200
2039	0	1,066,220	901,311	6,596	158,313	0	0	4,954,553	0	0	1,320	109,185	225,414	93,855
2040	0	1,077,354	910,337	4,613	162,404	0	0	5,290,472	0	0	920	112,006	240,584	101,015
2041	0	1,082,629	913,114	3,130	166,385	0	0	5,643,981	0	0	620	114,752	256,546	107,970
2042	0	1,082,505	910,160	2,102	170,243	0	0	6,015,899	0	0	413	117,412	273,337	114,511
2043	0	1,078,406	903,017	1,364	174,025	0	0	6,407,061	0	0	267	120,021	290,994	120,773
2044	0	1,072,612	894,071	672	177,869	0	0	6,818,343	0	0	131	122,672	309,558	127,012
2045	0	1,063,170	881,233	248	181,689	0	0	7,250,703	0	0	46	125,306	329,071	133,451
2046	0	1,049,499	863,948	168	185,383	0	0	7,705,126	0	0	32	127,854	349,577	139,682
2047	0	1,034,979	845,839	68	189,072	0	0	8,182,589	0	0	13	130,398	371,119	145,840
2048	0	1,019,161	826,259	0	192,902	0	0	8,684,119	0	0	0	133,040	393,746	152,297
2049	0	1,001,790	805,125	0	196,665	0	0	9,210,905	0	0	0	135,635	417,509	158,762
2050	0	983,546	783,022	0	200,524	0	0	9,764,049	0	0	0	138,296	442,460	165,386
2051	0	964,530	760,094	0	204,436	0	0	10,344,805	0	0	0	140,994	468,654	172,063
2052	0	944,854	736,371	0	208,484	0	0	10,954,453	8	0	0	143,786	496,150	178,898
2053	0	0	0	0	0	0	0	11,594,381	924,675	3,341	0	0	501,245	185,563
2054	0	0	0	0	0	0	0	11,174,292	904,096	3,302	0	0	482,798	192,076
2055	0	0	0	0	0	0	0	10,756,296	883,258	3,259	0	0	464,451	198,710
2056	0	0	0	0	0	0	0	10,340,748	862,299	3,214	0	0	446,217	205,351
2057	0	0	0	0	0	0	0	9,927,880	841,329	3,166	0	0	428,104	212,064

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

[b] *Assets accumulate in the Pension and Relief Fund.*

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

Actuarial Projections – Optional Funding in 2031
Table A-5

Valuation Plan Year End 30-Jun	Number Active	Number Pay Status	Total Assets: Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Premium Tax Allocation Contribs.	Investment Income	Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
2017	10	23	$682,046	$544,127	$6,357	$415,114	$57,782	$148,389	$52,616	$805,463	$13,254,546	$12,449,083	6%
2018	10	23	805,463	578,698	2,624	444,172	39,716	165,524	37,761	911,314	13,509,868	12,598,554	7%
2019	10	23	911,314	599,350	2,679	475,264	41,981	158,206	42,643	1,027,379	13,768,377	12,740,998	7%
2020	10	22	1,027,379	626,308	2,736	508,532	44,345	162,354	48,150	1,161,716	14,024,616	12,862,900	8%
2021	10	22	1,161,716	629,482	2,793	544,129	46,825	165,553	55,041	1,340,990	14,303,697	12,962,707	9%
2022	10	22	1,340,990	633,856	2,851	582,218	49,374	168,755	63,986	1,568,616	14,605,962	13,037,346	11%
2023	10	22	1,568,616	648,279	2,911	622,973	51,038	172,021	74,923	1,838,381	14,915,778	13,077,397	12%
2024	10	22	1,838,381	664,289	3,006	666,581	53,986	176,529	87,841	2,156,023	15,237,859	13,081,836	14%
2025	10	22	2,156,023	674,052	3,082	713,242	56,871	180,463	103,106	2,532,571	15,580,448	13,047,877	16%
2026	10	22	2,532,571	679,873	3,156	763,169	59,892	184,343	121,183	2,978,130	15,949,446	12,971,316	19%
2027	10	22	2,978,130	685,219	3,230	816,591	63,043	188,403	142,462	3,500,180	16,347,298	12,847,118	21%
2028	10	22	3,500,180	689,278	3,306	873,752	66,346	192,630	167,303	4,107,627	16,777,547	12,669,920	24%
2029	10	22	4,107,627	700,668	3,382	934,915	68,612	196,981	195,891	4,799,976	17,226,269	12,426,293	28%
2030	10	22	4,799,976	726,824	3,494	1,000,359	71,008	202,451	228,093	5,571,569	17,676,615	12,105,046	32%
2031	9	22	5,571,569	759,800	3,618	1,054,348	73,363	208,441	263,465	6,407,768	18,121,029	11,713,261	35%
2032	8	23	6,407,768	799,176	3,646	1,057,847	70,547	214,884	300,376	7,248,601	18,526,039	11,277,438	39%
2033	7	23	7,248,601	839,288	3,676	1,035,786	66,927	221,798	336,902	8,067,051	18,883,731	10,816,680	43%
2034	6	23	8,067,051	896,988	3,707	1,006,846	61,737	228,950	371,848	8,835,737	19,166,371	10,330,634	46%
2035	6	23	8,835,737	950,964	3,740	969,788	57,328	237,716	404,509	9,550,374	19,379,617	9,829,243	49%
2036	5	24	9,550,374	983,794	3,773	938,231	54,164	244,715	435,320	10,235,237	19,548,873	9,313,636	52%
2037	4	24	10,235,237	1,024,260	3,804	912,051	49,456	252,099	464,714	10,885,493	19,656,303	8,770,810	55%
2038	4	24	10,885,493	1,058,703	3,834	879,132	45,176	260,314	492,564	11,500,142	19,708,275	8,208,133	58%
2039	4	23	11,500,142	1,077,937	3,863	849,215	42,592	267,498	519,231	12,096,878	19,726,854	7,629,976	61%
2040	3	23	12,096,878	1,091,425	3,890	827,418	40,643	274,409	545,409	12,689,442	19,720,088	7,030,646	64%
2041	3	23	12,689,442	1,100,024	3,916	809,433	39,049	281,137	571,597	13,286,718	19,694,902	6,408,184	67%
2042	3	22	13,286,718	1,104,218	3,939	794,477	37,557	287,655	598,159	13,896,409	19,655,490	5,759,081	71%
2043	3	22	13,896,409	1,106,741	3,959	781,436	36,081	294,046	625,357	14,522,629	19,601,986	5,079,357	74%
2044	2	22	14,522,629	1,110,350	3,977	767,570	34,399	300,541	653,255	15,164,067	19,531,342	4,367,275	78%
2045	2	21	15,164,067	1,112,847	3,992	751,509	32,786	306,994	681,815	15,820,333	19,444,983	3,624,650	81%
2046	2	21	15,820,333	1,112,973	4,002	734,471	31,171	313,237	711,068	16,493,304	19,345,798	2,852,494	85%
2047	2	21	16,493,304	1,113,958	4,009	716,780	29,147	319,471	741,029	17,181,764	19,228,642	2,046,878	89%
2048	2	20	17,181,764	1,116,577	4,011	694,546	26,831	325,942	771,549	17,880,044	19,089,522	1,209,478	94%
2049	1	20	17,880,044	1,120,221	4,009	664,606	24,130	332,300	802,306	18,579,155	18,926,109	346,954	98%
2050	1	19	18,579,155	1,124,522	4,003	122,442	21,287	317,698	821,217	18,733,273	18,733,274	0	100%
2051	1	19	18,733,273	1,130,249	3,993	70,672	18,510	0	819,742	18,507,956	18,507,956	0	100%
2052	1	18	18,507,956	1,137,105	3,978	58,976	15,610	0	809,126	18,250,585	18,250,585	0	100%
2053	1	18	18,250,585	1,142,782	3,959	45,659	12,432	0	797,051	17,958,986	17,958,986	0	100%
2054	0	18	17,958,986	1,148,810	3,937	29,591	9,642	0	783,376	17,628,848	17,628,849	0	100%
2055	0	17	17,628,848	1,156,355	3,911	20,506	7,558	0	768,104	17,264,750	17,264,750	0	100%
2056	0	17	17,264,750	1,160,055	3,883	17,012	5,822	0	751,522	16,875,167	16,875,167	0	100%
2057	0	16	16,875,167	1,157,982	3,855	12,317	4,386	0	733,900	16,463,933	16,463,933	0	100%

Actuarial Projections – Optional Funding in 2031
Table A-6

	Employer Contributions								Minimum Payment			
Valuation Plan Year End 30-Jun[a,b]	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	Statewide Employer Contribution
2018	$470,997	$39,716	$244,966	$205,250	$720,292	$158,206	$562,086	$2,624	$769,960	$475,264	$475,264	$0
2019	495,101	41,981	257,520	215,539	739,400	162,354	577,046	2,679	795,264	508,532	508,532	0
2020	521,210	44,345	271,059	226,714	759,143	165,553	593,590	2,736	823,040	544,129	544,129	0
2021	548,877	46,825	285,371	238,546	778,796	168,755	610,041	2,793	851,379	582,218	582,218	0
2022	577,357	49,374	300,087	250,713	798,325	172,021	626,304	2,851	879,868	622,973	622,973	0
2023	594,449	51,038	308,751	257,713	817,604	176,529	641,075	2,911	901,698	666,581	666,581	0
2024	623,002	53,986	323,162	269,176	836,091	180,463	655,628	3,006	927,810	713,242	713,242	0
2025	653,936	56,871	339,002	282,130	853,755	184,343	669,412	3,082	954,624	763,169	763,169	0
2026	686,256	59,892	355,605	295,713	870,440	188,403	682,037	3,156	980,905	816,591	816,591	0
2027	720,056	63,043	372,994	309,952	885,881	192,630	693,251	3,230	1,006,433	873,752	873,752	0
2028	755,544	66,346	391,276	324,930	899,726	196,981	702,745	3,306	1,030,981	934,915	934,915	0
2029	777,815	68,612	401,855	333,243	911,556	202,451	709,105	3,382	1,045,730	1,000,359	1,000,359	0
2030	796,767	71,008	410,002	338,994	920,300	208,441	711,859	3,494	1,054,348	1,070,384	1,054,348	0
2031	813,939	73,363	417,565	344,202	924,911	214,884	710,027	3,618	1,057,847	1,145,311	1,057,847	0
2032	829,992	70,547	398,864	328,316	925,621	221,798	703,823	3,646	1,035,786	1,225,483	1,035,786	5,314
2033	845,107	66,927	374,796	307,869	924,252	228,950	695,302	3,676	1,006,846	1,311,267	1,006,846	11,567
2034	846,628	61,737	343,279	281,542	922,255	237,716	684,539	3,707	969,788	1,403,056	969,788	18,410
2035	874,267	57,328	316,951	259,623	919,583	244,715	674,868	3,740	938,231	1,501,270	938,231	27,237
2036	897,845	54,164	297,405	243,241	917,136	252,099	665,037	3,773	912,051	1,606,359	912,051	33,829
2037	912,864	49,456	269,964	220,508	915,134	260,314	654,820	3,804	879,132	1,718,804	879,132	40,976
2038	943,732	45,176	245,672	200,496	912,383	267,498	644,885	3,834	849,215	1,839,120	849,215	49,138
2039	981,850	42,592	230,909	188,317	909,648	274,409	635,239	3,863	827,418	1,967,858	827,418	56,108
2040	1,023,353	40,643	219,772	179,129	907,551	281,137	626,414	3,890	809,433	2,105,608	809,433	62,690
2041	1,069,638	39,049	211,638	172,589	905,627	287,655	617,972	3,916	794,477	2,253,001	794,477	69,165
2042	1,118,119	37,557	205,315	167,758	903,785	294,046	609,739	3,939	781,436	2,410,711	781,436	75,496
2043	1,168,007	36,081	198,573	162,492	901,660	300,541	601,119	3,959	767,570	2,579,461	767,570	82,042
2044	1,218,338	34,399	190,301	155,902	898,624	306,994	591,630	3,977	751,509	2,760,023	751,509	88,935
2045	1,274,056	32,786	182,390	149,603	894,113	313,237	580,876	3,992	734,471	2,953,225	734,471	96,318
2046	1,332,407	31,171	175,465	144,295	887,954	319,471	568,483	4,002	716,780	2,719,101	716,780	103,770
2047	1,389,810	29,147	166,166	137,019	879,460	325,942	553,518	4,009	694,546	1,877,697	694,546	111,609
2048	1,450,450	26,831	155,031	128,199	864,695	332,300	532,395	4,011	664,606	1,004,008	664,606	120,172
2049	1,512,022	24,130	142,563	118,433	833,298	317,698	494,478	4,009	122,442	122,442	122,442	129,107
2050	1,575,109	21,287	127,469	106,183	0	0	0	4,003	70,672 [c]	70,672	70,672	138,717
2051	1,638,699	18,510	111,680	93,170	0	0	0	3,993	58,976 [c]	58,976	58,976	148,536
2052	1,703,792	15,610	96,434	80,823	0	0	0	3,978	45,659 [c]	45,659	45,659	158,439
2053	1,767,265	12,432	80,701	68,269	0	0	0	3,959	29,591 [c]	29,591	29,591	168,309
2054	1,829,294	9,642	63,638	53,996	0	0	0	3,937	20,506 [c]	20,506	20,506	178,336
2055	1,892,472	7,558	48,768	41,210	0	0	0	3,911	17,012 [c]	17,012	17,012	188,053
2056	1,955,728	5,822	37,801	31,979	0	0	0	3,883	12,317 [c]	12,317	12,317	196,998
2057	2,019,653	4,386	28,768	24,382	0	0	0	3,855	8,676 [c]	8,676	8,676	205,629

[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 2020
Table A-7

Valuation Plan Year End 30-Jun	Number Active	Number Pay Status	Total Assets: Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Premium Tax Allocation Contribs.	Investment Income	Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
2017	10	23	$682,046	$544,127	$6,357	$415,114	$57,782	$148,389	$52,616	$805,463	$13,254,546	$12,449,083	6%
2018	10	23	805,463	578,698	2,624	444,172	39,716	165,524	37,761	911,314	13,509,868	12,598,554	7%
2019	10	23	911,314	599,350	2,679	475,264	41,981	158,206	42,643	1,027,379	13,768,377	12,740,998	7%
2020	9	22	1,027,379	626,308	2,705	490,345	43,013	162,354	47,716	1,141,794	14,017,904	12,876,110	8%
2021	9	22	1,141,794	629,434	2,734	490,514	44,173	165,553	52,895	1,262,761	14,282,961	13,020,200	9%
2022	9	22	1,262,761	633,666	2,767	491,715	45,423	168,755	58,370	1,390,591	14,563,661	13,173,070	10%
2023	8	22	1,390,591	647,885	2,801	503,645	45,710	172,021	64,150	1,525,431	14,843,696	13,318,265	10%
2024	8	22	1,525,431	663,632	2,835	516,603	45,637	176,529	70,253	1,667,986	15,119,154	13,451,168	11%
2025	8	22	1,667,986	673,021	2,872	522,948	46,329	180,463	76,703	1,818,537	15,401,327	13,582,790	12%
2026	7	22	1,818,537	678,329	2,909	525,102	47,199	184,343	83,512	1,977,455	15,695,979	13,718,524	13%
2027	7	22	1,977,455	683,089	2,950	526,496	48,194	188,403	90,700	2,145,210	16,005,050	13,859,840	13%
2028	7	22	2,145,210	686,501	2,991	526,346	49,301	192,630	98,288	2,322,283	16,331,291	14,009,008	14%
2029	6	22	2,322,283	697,185	3,034	534,285	49,305	196,981	106,291	2,508,926	16,659,839	14,150,913	15%
2030	6	22	2,508,926	722,580	3,077	557,578	47,642	202,451	114,727	2,705,667	16,964,112	14,258,445	16%
2031	5	22	2,705,667	754,681	3,119	587,968	45,090	208,441	123,618	2,912,984	17,230,721	14,317,737	17%
2032	4	23	2,912,984	792,960	3,161	624,815	41,839	214,884	132,985	3,131,386	17,447,119	14,315,733	18%
2033	4	23	3,131,386	831,915	3,201	662,745	37,770	221,798	142,853	3,361,436	17,606,183	14,244,747	19%
2034	3	23	3,361,436	888,594	3,241	719,596	32,063	228,950	153,240	3,603,450	17,679,611	14,076,161	20%
2035	2	23	3,603,450	941,590	3,280	771,128	27,062	237,716	164,181	3,858,667	17,672,262	13,813,595	22%
2036	2	23	3,858,667	973,398	3,316	801,672	23,228	244,715	175,707	4,127,275	17,608,709	13,481,434	23%
2037	1	24	4,127,275	1,012,785	3,350	840,949	17,774	252,099	187,834	4,409,795	17,470,104	13,060,309	25%
2038	1	23	4,409,795	1,046,167	3,381	873,311	12,778	260,314	200,596	4,707,246	17,261,878	12,554,632	27%
2039	1	23	4,707,246	1,064,295	3,410	889,564	9,575	267,498	214,028	5,020,206	17,005,938	11,985,732	30%
2040	0	23	5,020,206	1,076,398	3,435	899,358	7,096	274,409	228,157	5,349,394	16,711,310	11,361,916	32%
2041	0	23	5,349,394	1,082,670	3,458	903,083	5,073	281,137	243,018	5,695,577	16,385,881	10,690,304	35%
2042	0	22	5,695,577	1,083,536	3,477	901,117	3,533	287,655	258,644	6,059,512	16,035,047	9,975,535	38%
2043	0	22	6,059,512	1,081,608	3,492	896,015	2,462	294,046	275,068	6,442,003	15,663,113	9,221,110	41%
2044	0	21	6,442,003	1,078,366	3,504	889,474	1,475	300,541	292,329	6,843,952	15,272,860	8,428,908	45%
2045	0	21	6,843,952	1,070,550	3,510	878,095	830	306,994	310,467	7,266,279	14,869,429	7,603,150	49%
2046	0	20	7,266,279	1,058,296	3,512	862,048	617	313,237	329,521	7,709,894	14,459,260	6,749,366	53%
2047	0	19	7,709,894	1,045,029	3,509	845,002	391	319,471	349,534	8,175,753	14,043,060	5,867,307	58%
2048	0	19	8,175,753	1,030,309	3,501	826,313	205	325,942	370,549	8,664,952	13,622,241	4,957,289	64%
2049	0	18	8,664,952	1,013,980	3,487	805,971	143	332,300	392,614	9,178,512	13,198,719	4,020,207	70%
2050	0	18	9,178,512	996,729	3,468	784,588	99	338,820	415,777	9,717,599	12,773,894	3,056,295	76%
2051	0	17	9,717,599	978,290	3,444	761,950	62	345,430	440,089	10,283,396	12,348,728	2,065,332	83%
2052	0	16	10,283,396	959,059	3,414	738,358	36	352,269	465,605	10,877,192	11,923,973	1,046,781	91%
2053	0	16	10,877,192	939,246	3,379	714,041	23	359,303	492,383	11,500,317	11,500,317	0	100%
2054	0	15	11,500,317	918,954	3,341	3,294	14	0	497,065	11,078,395	11,078,395	0	100%
2055	0	15	11,078,395	898,296	3,299	3,245	8	0	478,538	10,658,591	10,658,591	0	100%
2056	0	14	10,658,591	877,490	3,255	3,208	5	0	460,109	10,241,168	10,241,169	0	100%
2057	0	13	10,241,168	856,645	3,209	3,167	2	0	441,789	9,826,272	9,826,273	0	100%

Actuarial Projections – Conservation Funding in 2020
Table A-8

	Benefit Payment Account [a]						Accumulation Account [b]						Minimum Payment			
Plan Year End 30-Jun	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	6.50% of Pay Employee Contribs.	63.61% of Premium Tax Allocation	Investment Income	Assets (boy)[c]	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Employee Contribs.	36.39% of Premium Tax Allocation	Investment Income	Conservation Employer Cont.	Alternative Employer Cont.	Minimum Alt /Cons Cont.	Statewide Employer Contribution
2018	$805,463	$581,322	$444,172	$39,716	$165,524	$37,761	$0	$0	$0	$0	$0	$0	NA	$444,172	$444,172	$0
2019	911,314	602,029	475,264	41,981	158,206	42,643	0	0	0	0	0	0	NA	475,264	475,264	0
2020	1,027,379	629,013	490,345	35,390	103,278	46,232	1,073,611	0	0	7,623	59,076	1,484	490,345	508,532	490,345	1,366
2021	0	632,168	490,514	36,341	105,313	0	1,141,794	0	0	7,832	60,240	52,895	490,514	544,129	490,514	2,806
2022	0	636,433	491,715	37,368	107,350	0	1,262,761	0	0	8,055	61,405	58,370	491,715	582,218	491,715	4,237
2023	0	650,686	503,645	37,614	109,427	0	1,390,591	0	0	8,096	62,594	64,150	503,645	622,973	503,645	5,745
2024	0	666,467	516,603	37,569	112,295	0	1,525,431	0	0	8,068	64,234	70,253	516,603	666,581	516,603	8,942
2025	0	675,893	522,948	38,147	114,798	0	1,667,986	0	0	8,182	65,666	76,703	522,948	713,242	522,948	11,391
2026	0	681,238	525,102	38,870	117,266	0	1,818,536	0	0	8,329	67,077	83,512	525,102	763,169	525,102	13,754
2027	0	686,039	526,496	39,694	119,849	0	1,977,455	0	0	8,500	68,555	90,700	526,496	816,591	526,496	16,105
2028	0	689,492	526,346	40,609	122,537	0	2,145,209	0	0	8,692	70,093	98,288	526,346	873,752	526,346	18,490
2029	0	700,219	534,285	40,629	125,305	0	2,322,282	0	0	8,676	71,676	106,291	534,285	934,915	534,285	20,939
2030	0	725,657	557,578	39,294	128,785	0	2,508,925	0	0	8,348	73,666	114,727	557,578	1,000,359	557,578	25,226
2031	0	757,800	587,968	37,237	132,595	0	2,705,666	0	0	7,853	75,846	123,618	587,968	1,070,384	587,968	30,494
2032	0	796,121	624,815	34,612	136,694	0	2,912,982	0	0	7,227	78,190	132,985	624,815	1,145,311	624,815	36,563
2033	0	835,116	662,745	31,279	141,092	0	3,131,385	0	0	6,491	80,706	142,853	662,745	1,225,483	662,745	43,296
2034	0	891,835	719,596	26,597	145,642	0	3,361,435	0	0	5,466	83,308	153,240	719,596	1,311,267	719,596	50,636
2035	0	944,870	771,128	22,524	151,218	0	3,603,449	0	0	4,538	86,498	164,181	771,128	1,403,056	771,128	60,035
2036	0	976,714	801,672	19,372	155,670	0	3,858,666	0	0	3,856	89,045	175,707	801,672	1,501,270	801,672	67,281
2037	0	1,016,135	840,949	14,819	160,367	0	4,127,274	0	0	2,955	91,731	187,834	840,949	1,606,359	840,949	75,167
2038	0	1,049,548	873,311	10,644	165,593	0	4,409,794	0	0	2,134	94,721	200,596	873,311	1,718,804	873,311	84,154
2039	0	1,067,705	889,564	7,978	170,163	0	4,707,245	0	0	1,597	97,335	214,028	889,564	1,839,120	889,564	91,917
2040	0	1,079,833	899,358	5,915	174,560	0	5,020,205	0	0	1,181	99,850	228,157	899,358	1,967,858	899,358	99,183
2041	0	1,086,128	903,083	4,206	178,839	0	5,349,393	0	0	867	102,298	243,018	903,083	2,105,608	903,083	106,242
2042	0	1,087,013	901,117	2,911	182,985	0	5,695,576	0	0	622	104,669	258,644	901,117	2,253,001	901,117	113,048
2043	0	1,085,100	896,015	2,034	187,051	0	6,059,511	0	0	428	106,995	275,068	896,015	2,410,711	896,015	119,648
2044	0	1,081,870	889,474	1,213	191,183	0	6,442,002	0	0	262	109,358	292,329	889,474	2,579,461	889,474	126,093
2045	0	1,074,060	878,095	677	195,288	0	6,843,951	0	0	153	111,707	310,467	878,095	2,760,023	878,095	132,707
2046	0	1,061,808	862,048	501	199,259	0	7,266,278	0	0	116	113,978	329,521	862,048	2,953,225	862,048	139,090
2047	0	1,048,538	845,002	312	203,224	0	7,709,893	0	0	79	116,246	349,534	845,002	3,159,951	845,002	145,379
2048	0	1,033,810	826,313	156	207,341	0	8,175,752	0	0	49	118,601	370,549	826,313	3,381,148	826,313	151,955
2049	0	1,017,467	805,971	111	211,385	0	8,664,951	0	0	32	120,914	392,614	805,971	3,617,828	805,971	158,536
2050	0	1,000,197	784,588	76	215,533	0	9,178,511	0	0	23	123,287	415,777	784,588	3,871,076	784,588	165,228
2051	0	981,734	761,950	46	219,738	0	9,717,598	0	0	16	125,692	440,089	761,950	4,142,051	761,950	171,954
2052	0	962,473	738,358	26	224,089	0	10,283,395	0	0	10	128,181	465,605	738,358	1,794,725	738,358	178,830
2053	0	942,621	714,041	17	228,563	0	10,877,191	4	0	6	130,740	492,383	714,041	722,531	714,041	185,523
2054	0	0	0	0	0	0	11,500,316	922,295	3,294	14	0	497,065	3,294	3,507	3,294	192,050
2055	0	0	0	0	0	0	11,078,395	901,595	3,245	8	0	478,538	3,245	3,428	3,245	198,694
2056	0	0	0	0	0	0	10,658,591	880,745	3,208	5	0	460,109	3,208	3,360	3,208	205,342
2057	0	0	0	0	0	0	10,241,168	859,854	3,167	2	0	441,789	3,167	3,298	3,167	212,058

[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, 2020.*