

City Of St. Albans, West  
Virginia  
Firemen's Pension and  
Relief Fund

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



September 19, 2018

Ms. Barbara Hughes  
City Treasurer  
1499 MacCorkle Avenue, P.O. Box 1488  
St. Albans, WV 25177

Firefighter Brandon Price  
Pension Board Secretary  
City of St. Albans Firemen's Pension and Relief Fund

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

Dear Ms. Hughes and Firefighter Price:

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

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

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

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

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

This actuarial valuation is based upon:

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

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

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

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

**Actuarial Assumptions** – The actuarial assumptions used include a discount rate of 4.00%. The actuarial assumptions used in the actuarial valuation are set forth in Section VI of the report: Actuarial Assumptions and Methods.

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

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

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

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



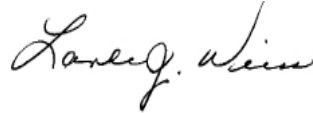
The signing actuaries are independent of the plan sponsor.

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

Sincerely,



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



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

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## **SECTION I**

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# **ACTUARIAL VALUATION RESULTS AS OF JULY 1, 2017**

# Executive Summary

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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 St. Albans, 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 9.5% of pay. Employees hired on or after January 1, 2010, contribute 9.5% of pay.
- The Plan also receives premium tax allocation assigned to the Fund for the plan year.

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

## Executive Summary (Continued)

The following table provides the Plan's funded status:

<b>Funded Status as of:</b>	<b>July 1, 2017</b>
Assets	\$2,576,530
Actuarial Accrued Liability	\$19,919,903
Unfunded Actuarial Accrued Liability	\$17,343,373
Funded Ratio	12.93%

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

<b>Employer Contributions for FYE:</b>	<b>June 30, 2018</b>
FYE 06/30/2017 Alternative Contribution	\$240,553
7% Increase in Alternative Contribution	\$16,839
FYE 06/30/2018 Alternative Contribution	\$257,392
Additional Contribution	\$0
Final FYE 06/30/2018 Alternative Contribution	\$257,392

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

<b>Estimated Employer Contributions for FYE:</b>	<b>June 30, 2019</b>
FYE 06/30/2018 Alternative Contribution	\$257,392
7% Increase in Alternative Contribution	\$18,017
FYE 06/30/2019 Alternative Contribution	\$275,409
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	\$275,409
Additional Contribution to satisfy 15-year Solvency Test on a Closed Group Basis (to grant Supplemental Benefits; i.e. COLA increases)	\$10,349
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	\$285,758



## Executive Summary (Continued)

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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.”

In accordance with section §8-22-26a(f) of the West Virginia Code, and upon approval of the plan’s board of trustees, plans that do not satisfy the actuarial soundness requirements for purposes of granting Supplemental Benefits, may increase member’s contribution rate from 7.0% up to 9.5%. Consequently, the additional contributions needed to satisfy the minimum standards for actuarial soundness can be based on a combination of increased sponsor and plan member contribution as limited by the West Virginia Code. The Board of Trustees of the Plan elected to increase the contribution rate for members hired before January 1, 2010, to 9.5% of pay.

In the solvency projections shown in Tables 1(a) through 1(e), each year the employer contribution is projected to be the greater of:

- (1) The fiscal year end June 30, 2019, Alternative contribution plus any additional solvency contribution increased by 7% per year, and
- (2) The amount needed to keep the fund’s market value of assets greater than zero.

The sponsor is projected to satisfy the 15-year solvency test by making additional annual contributions in excess of the minimum Alternative contribution starting in fiscal year end June 30, 2019. To receive the State Premium Tax Allocation, no additional contribution is required to remain solvent on an open group basis as shown in Table 1(a). To provide additional supplemental benefits, an additional annual contribution of \$10,349 in fiscal year end June 30, 2019, increasing by 7% each year thereafter, is required to remain solvent on a closed group basis as shown in Table 1(c).

## Executive Summary (Continued)

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Because the 15-year solvency test is not consistent with generally accepted actuarial principles, we recommended making an additional annual contribution in fiscal year end June 30, 2019, of \$67,179 instead of \$10,349, increasing 7% per year each year thereafter. On a closed group basis, this is projected to maintain assets at no less than 50% of the value as of June 30, 2017, over the 40-year projection period (to a low of \$1,288,282 as of June 30, 2036) as shown in Table 1(e). Under this scenario, the funded ratio is projected to reach a minimum level of 10% in 2025 on an open group projection basis, as shown in Table 1(d).

The Plan provides Deferred Retirement Option Program (“DROP”) benefits to members who were eligible to retire from July 1, 2011, through June 30, 2016. The DROP provisions include:

- The member’s benefit at retirement is based on service and final average salary as of the DROP election date,
- During the DROP period, the member may defer commencement of retirement for no more than five years before attaining age 65,
- During the DROP period, benefits accumulate in the member’s DROP account without interest,
- During the DROP period, the member is required to contribute 9.5% of compensation, and
- During the DROP period, the member is considered a retired member for purposes of the premium tax allocation and eligibility to earn supplemental pension benefits.

As of June 30, 2017, two members are participating in the DROP.

## Executive Summary (Continued)

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### 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 1<sup>st</sup> 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)

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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 16% (using a testing interest rate of 5.50% for all plans using the Alternative funding policy), ratio of assets to benefits of 2.62, equity allocation of 46%, and 15-year projected funded ratio of 8%, resulted in a discount rate assumption of 4.00%.
- The Fund experienced an approximate annualized return of 8.58% on the market value of assets during the plan year ended June 30, 2017, which compares to the expected annualized return of 4.00%. The difference in actual versus expected return produced an asset (gain)/loss of (\$110,291).
- 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 (\$87,856) 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 1(a), page II-1 and assuming that the sponsor makes the statutory required contributions, if all actuarial assumptions are realized in the future, including an investment return of 4.00%:

- The funded ratio is projected to decrease from 13% at June 30, 2017, to 7% at June 30, 2024, to 4%, at June 30, 2033, and then increase to 42% at 2057.
- Employer contributions are expected to increase from \$257,392 (or 28% of pay) for the fiscal year end June 30, 2018, to 3,602,145 (or 98% of pay) for fiscal year end June 30, 2057.

## Executive Summary (Continued)

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Please note that a funded ratio of only 13% at June 30, 2017, which declines to 4% at June 30, 2033, means that the plan is severely underfunded.

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 \$275,409 is sufficient to finance only 59% of the net employer normal cost of \$468,968. The state premium tax allocation of \$227,823 is sufficient to finance only 1.3% of the unfunded actuarial accrued liability of \$17,343,373.

This actuarial valuation assumes that the City will be able to make future contributions on a timely basis. The ability of the plan to pay the promised benefits 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 the minimum employer contribution calculated under the Alternative funding policy as defined in West Virginia Code 8-22-20 (c)(1) is just that – the minimum that needs to be contributed each and every year. Because this is a severely underfunded plan, we continue to recommend that the plan sponsor consider making additional contributions (in excess of the minimum requirement) to ensure that there are sufficient assets available in the fund in all years to pay the promised benefits.

If the minimum employer contributions (calculated under the Alternative funding policy) are not made or investment return is less than the assumption of 4.00%, the funded ratio will be lower and the cash flow strain could be higher. If another significant market downturn occurs while the plan's funded ratio is declining, the plan may need to liquidate assets in order to pay benefits which could have a further adverse effect on the funded status of the System.

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

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

## Executive Summary (Continued)

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

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

## Schedule A: Summary of Key Valuation Results

Valuation Date	<b>July 1, 2016</b>		<b>July 1, 2017</b>	
Valuation Interest Rate	4.00%		4.00%	
Cost-of-Living Adjustment	2.75%		2.75%	
Wage Inflation	3.75%		3.75%	
Expected Payroll	\$912,222		\$914,121	
Average Pay	\$45,611		\$45,706	
Expected Benefit Payments	\$855,063		\$984,623	
<b>1. Actuarial Accrued Liability</b>	<u>No.</u>		<u>No.</u>	
(a) Actives	20	\$6,582,138	20	\$6,696,432
(b) Retirees <sup>a</sup>	14	\$9,430,451	14	\$9,247,113
(c) Survivors	6	\$1,235,508	6	\$1,203,187
(d) Disabled Members	5	\$2,067,047	6	\$2,773,171
(e) Deferred Vested Members	0	\$0	0	\$0
(f) Total	45	\$19,315,144	46	\$19,919,903
<b>2. Present Value of Future Normal Costs</b>		\$6,477,354		\$6,434,060
<b>3. Present Value of Benefits (1(f) + 2)</b>		\$25,792,498		\$26,353,963
<b>4. Market Value of Assets</b>		\$2,444,156		\$2,576,530
<b>5. Unfunded Actuarial Accrued Liability (1(f) - 4)</b>		\$16,870,988		\$17,343,373
<b>6. Funded Ratio (4 / 1(f))</b>		12.65%		12.93%
<b>7. Net Employer Normal Cost</b>				
(a) Normal Cost		\$539,303		\$551,675
(b) Administrative Expenses		\$4,050		\$4,134
(c) Gross Normal Cost (a + b)		\$543,353		\$555,809
(d) Employee Contribution Rate <sup>b</sup>		9.50%		9.50%
(e) Expected Employee Contributions		\$86,661		\$86,841
(f) Net Employer Normal Cost (c - e)		\$456,692		\$468,968
( % of Compensation)		50.06%		51.30%
		<b>FYE 2018</b>		<b>FYE 2019</b>
<b>8. Estimated Minimum Employer Contribution <sup>c</sup></b>				
(a) Prior Year Alternative Contribution		\$240,553		\$257,392
(b) Increase in Alternative Contribution		7.00%		7.00%
(c) Current Year Alternative Contribution		\$257,392		\$275,409
(d) Additional Contribution <sup>d</sup>		\$0		\$0
(e) Alternative Contribution ( c + d )		\$257,392		\$275,409

<sup>a</sup> Two DROP members are classified as retired members for purposes of supplemental benefits, premium tax allocation and the valuation of liabilities.

<sup>b</sup> Blended rate reflecting 9.5% for members hired before January 1, 2010, and 9.5% for members hired after January 1, 2010.

<sup>c</sup> Estimated Minimum Employer Contribution is based on Alternative funding policy and is assumed to be made in plan year ending June 30, 2019.

<sup>d</sup> The sponsor is not required to make additional contributions in either fiscal year end June 30, 2018, or fiscal year end June 30, 2019, in order to receive 100% of the State Premium Tax Allocation. The sponsor is required to make additional contributions of \$6,489 in fiscal year end June 30, 2018, and \$10,349 in fiscal year end June 30, 2019, in order to grant additional supplemental benefits.

## Schedule B: (Gain)/Loss Analysis

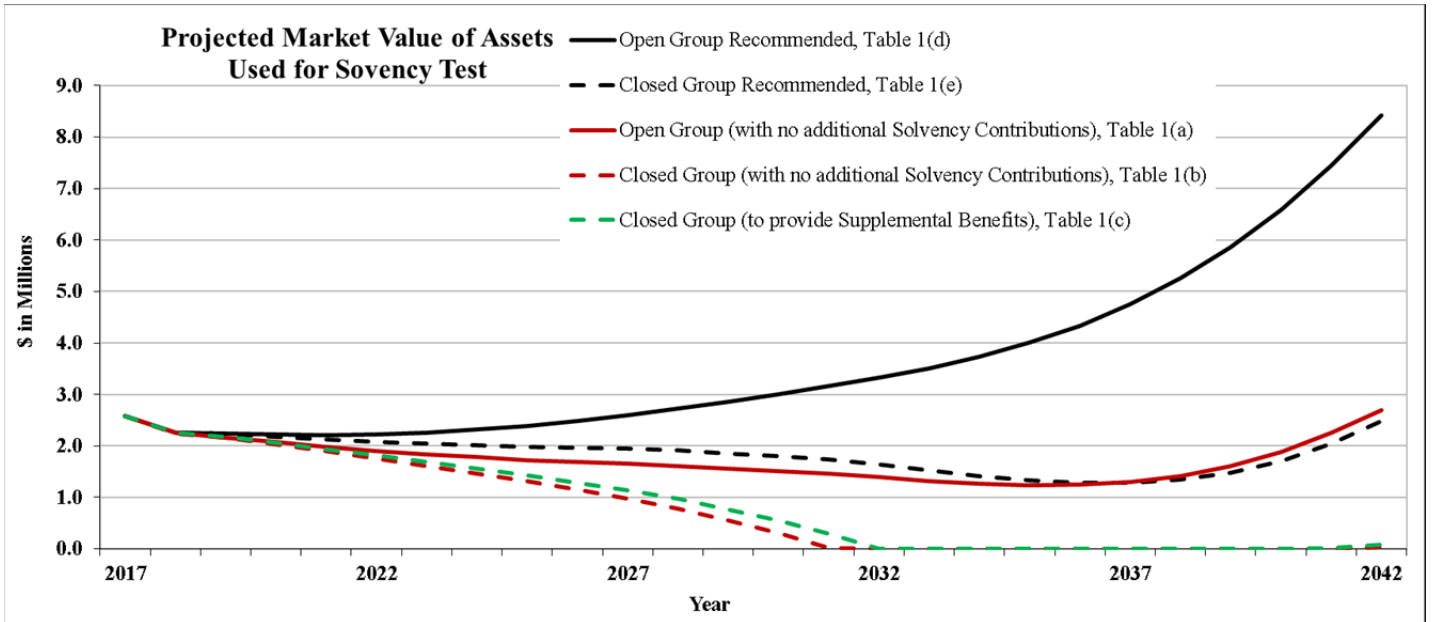
### Experience (Gain)/Loss for Plan Year Ended June 30, 2017

1. (a) Actuarial Accrued Liability as of 7/1/2016	\$19,315,144
(b) Normal Cost due 7/1/2016	\$539,303
(c) Interest on (a) and (b) to 6/30/2017	\$783,392
(d) Benefit Payments with interest to 6/30/2017	\$630,080
(e) Effect of Assumption Changes	\$0
(f) Expected Liability at 7/1/2017 [(a) + (b) + (c) - (d) + (e)]	\$20,007,759
(g) Actual Liability at 7/1/2017	\$19,919,903
(h) Liability (Gain)/Loss [(g) - (f)]	<b>(\$87,856)</b>
2. (a) Market Value of Assets as of 7/1/2016	\$2,444,156
(b) Interest on (a) to 6/30/2017	\$97,766
(c) Contributions with interest to 6/30/2017	\$554,397
(d) Benefit Payments with interest to 6/30/2017	\$630,080
(e) Expected Assets at 6/30/2017 [(a) + (b) + (c) - (d)]	\$2,466,239
(f) Actual Assets at 7/1/2017	\$2,576,530
(g) Asset (Gain)/Loss [(e) - (f)]	<b>(\$110,291)</b>
3. Total (Gain)/Loss [1(h) + 2(g)]	<b>(\$198,147)</b>

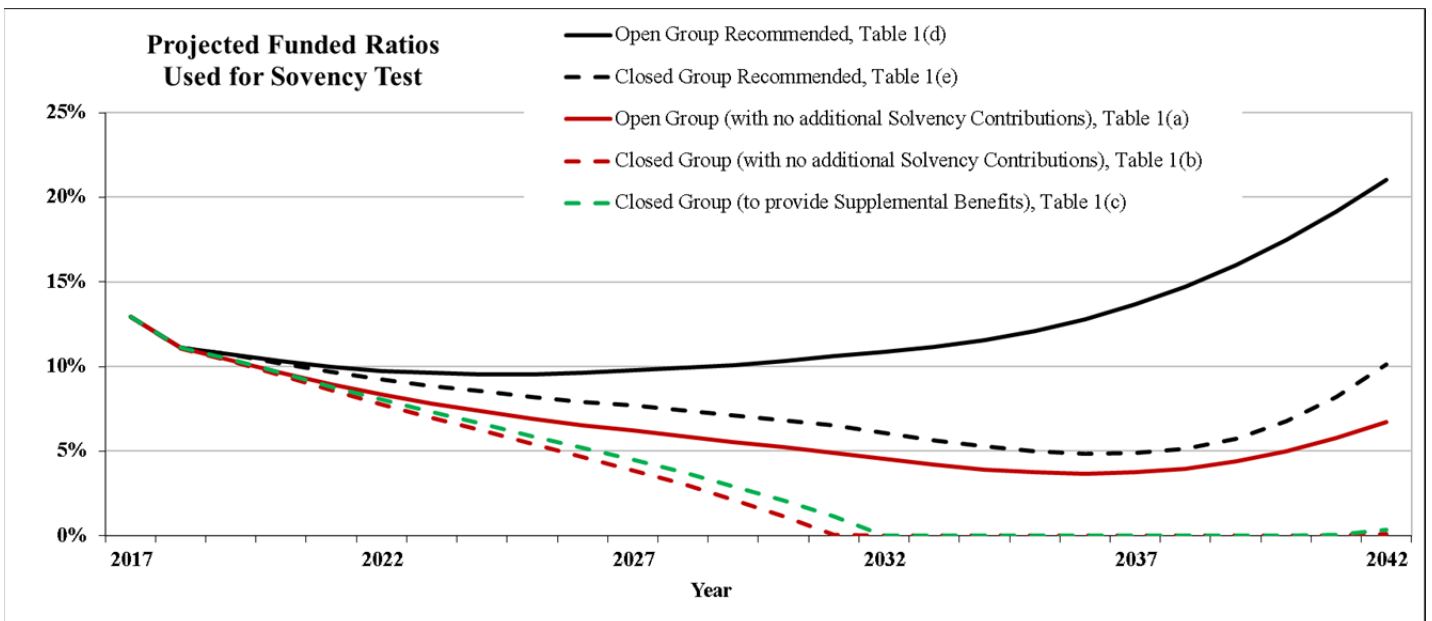


# Graphs 1A and 1B: Solvency Projections

## Graph 1A



## Graph 1B



## **SECTION II**

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**ACTUARIAL PROJECTIONS**

**ALTERNATIVE FUNDING POLICY**

# Alternative Funding on an Open Group Basis, Table 1(a) (with no Additional Solvency Contributions)

Valuation Plan Year End	Number		Total Assets										Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Pay Status	Total Payroll	Assets (boy)	Benefit Payments	Expenses	Employer Contributions	Member Contributions*	Premium Tax Allocation Contributions	Investment Income	Assets (eoy)	Assets Total				
												Active			
2017	20	26	\$912,222	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958	\$207,323	\$2,576,530	\$19,919,903	\$17,343,373	13%	
2018	20	26	914,121	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,080	18,024,583	11%	
2019	20	27	934,207	2,255,497	762,678	4,271	275,409	88,967	227,823	86,759	2,167,506	20,886,351	18,718,845	10%	
2020	20	28	969,470	2,167,506	798,678	4,476	294,688	92,508	237,787	83,172	2,072,507	21,498,401	19,425,894	10%	
2021	20	28	1,012,737	2,072,507	819,883	4,638	315,316	96,566	244,055	79,562	1,983,485	22,136,998	20,153,513	9%	
2022	20	28	1,055,049	1,983,485	841,755	4,791	337,388	100,561	250,037	76,200	1,901,124	22,802,122	20,900,998	8%	
2023	20	28	1,108,402	1,901,124	857,923	4,950	361,005	105,675	256,276	73,274	1,834,481	23,507,760	21,673,279	8%	
2024	20	28	1,150,552	1,834,481	878,618	5,081	386,275	109,673	261,903	70,887	1,779,519	24,245,202	22,465,683	7%	
2025	20	29	1,189,108	1,779,519	913,220	5,249	413,314	113,497	268,630	68,744	1,725,235	24,999,131	23,273,896	7%	
2026	20	29	1,243,461	1,725,235	941,635	5,434	442,246	118,821	275,931	66,829	1,681,993	25,786,461	24,104,468	7%	
2027	20	29	1,288,352	1,681,993	969,505	5,584	473,203	123,115	282,399	65,371	1,650,992	26,604,239	24,953,247	6%	
2028	20	30	1,311,402	1,650,992	1,020,258	5,767	506,327	125,467	290,068	63,977	1,610,806	27,416,404	25,805,598	6%	
2029	20	30	1,349,732	1,610,806	1,080,372	6,031	541,770	129,422	300,354	62,158	1,558,107	28,219,713	26,661,606	6%	
2030	20	31	1,407,354	1,558,107	1,119,157	6,269	579,694	135,012	309,838	60,326	1,517,551	29,047,357	27,529,806	5%	
2031	20	31	1,429,691	1,517,551	1,178,172	6,465	620,273	137,173	318,193	58,543	1,467,096	29,860,182	28,393,086	5%	
2032	20	32	1,451,869	1,467,096	1,256,405	6,751	663,692	139,682	329,543	56,105	1,392,962	30,636,464	29,243,502	5%	
2033	20	32	1,500,478	1,392,962	1,317,382	7,037	710,150	144,562	341,379	53,177	1,317,811	31,407,009	30,089,198	4%	
2034	20	32	1,559,943	1,317,811	1,359,186	7,269	759,861	150,327	351,561	50,639	1,263,744	32,198,914	30,935,170	4%	
2035	20	33	1,612,260	1,263,744	1,399,507	7,478	813,051	155,490	361,715	49,030	1,236,045	33,010,512	31,774,467	4%	
2036	20	32	1,680,673	1,236,045	1,436,040	7,706	869,965	162,325	372,583	48,672	1,245,844	33,856,201	32,610,357	4%	
2037	20	32	1,742,348	1,245,844	1,465,673	7,895	930,863	168,199	382,266	49,987	1,303,592	34,740,403	33,436,811	4%	
2038	20	32	1,814,445	1,303,592	1,495,444	8,110	996,023	174,703	393,344	53,343	1,417,450	35,669,785	34,252,335	4%	
2039	20	32	1,895,478	1,417,450	1,512,329	8,306	1,065,745	181,789	403,804	59,286	1,607,440	36,661,602	35,054,162	4%	
2040	20	32	1,979,721	1,607,440	1,525,088	8,496	1,140,347	189,450	414,294	68,466	1,886,413	37,722,721	35,836,308	5%	
2041	20	32	2,054,139	1,886,413	1,550,881	8,693	1,220,171	196,275	425,062	81,040	2,249,386	38,838,586	36,589,200	6%	
2042	20	32	2,125,203	2,249,386	1,594,101	8,924	1,305,583	202,883	437,135	96,760	2,688,721	39,993,372	37,304,651	7%	
2043	20	32	2,209,215	2,688,721	1,633,134	9,168	1,396,974	210,687	449,595	115,767	3,219,443	41,200,433	37,980,990	8%	
2044	20	32	2,289,082	3,219,443	1,672,010	9,394	1,494,762	217,838	461,614	138,537	3,850,790	42,459,897	38,609,107	9%	
2045	20	31	2,377,149	3,850,790	1,713,388	9,647	1,599,395	225,887	474,472	165,453	4,592,963	43,774,814	39,181,851	10%	
2046	20	31	2,472,241	4,592,963	1,747,859	9,892	1,711,353	234,537	487,168	197,092	5,465,362	45,157,294	39,691,932	12%	
2047	20	31	2,570,022	5,465,362	1,783,367	10,138	1,831,148	243,065	499,956	234,074	6,480,100	46,610,927	40,130,827	14%	
2048	20	31	2,668,092	6,480,100	1,820,516	10,392	1,959,328	251,437	513,188	276,890	7,650,036	48,134,556	40,484,520	16%	
2049	20	31	2,767,322	7,650,036	1,861,706	10,660	2,096,481	260,334	527,006	326,033	8,987,524	49,725,569	40,738,045	18%	
2050	20	31	2,870,946	8,987,524	1,909,747	10,941	2,243,235	269,799	541,474	381,955	10,503,299	51,385,167	40,881,868	20%	
2051	20	31	2,976,610	10,503,299	1,962,373	11,229	2,400,261	279,063	556,276	445,125	12,210,422	53,114,790	40,904,368	23%	
2052	20	31	3,082,726	12,210,422	2,017,311	11,529	2,568,279	288,431	571,680	516,133	14,126,105	54,911,501	40,785,396	26%	
2053	20	31	3,193,034	14,126,105	2,077,293	11,845	2,748,059	298,551	587,869	595,648	16,267,094	56,774,665	40,507,571	29%	
2054	20	31	3,307,400	16,267,094	2,143,367	12,170	2,940,423	309,170	604,544	684,323	18,650,017	58,705,390	40,055,373	32%	
2055	20	31	3,426,415	18,650,017	2,213,628	12,503	3,146,253	320,274	621,771	782,878	21,295,062	60,706,220	39,411,158	35%	
2056	20	31	3,549,844	21,295,062	2,286,812	12,843	3,366,491	331,774	639,445	892,164	24,225,281	62,779,522	38,554,241	39%	
2057	20	31	3,677,709	24,225,281	2,363,729	13,192	3,602,145	343,732	657,645	1,013,106	27,464,988	64,927,492	37,462,504	42%	

<sup>a</sup> Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

# Alternative Funding on a Closed Group Basis, Table 1(b) (with no Additional Solvency Contributions)

Valuation Plan Year End 30-Jun	Number		Total Payroll	Total Assets								Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status		Assets (bo)	Benefit Payments	Expenses	Employer Contributions	Member Contributions <sup>a</sup>	Premium Tax	Investment Income	Assets (eoy)			
									Allocation Contributions					
2017	20	26	\$912,222	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958	\$207,323	\$2,576,530	\$19,919,903	\$17,343,373	13%
2018	19	26	914,121	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,079	18,024,582	11%
2019	17	27	901,722	2,255,497	762,678	4,177	275,409	85,664	227,823	86,696	2,164,234	20,867,473	18,703,239	10%
2020	16	28	878,462	2,164,234	798,545	4,225	294,688	83,454	216,170	82,441	2,038,217	21,426,056	19,387,839	10%
2021	15	28	872,704	2,038,217	819,276	4,274	315,316	82,907	213,002	77,324	1,903,216	21,980,939	20,077,723	9%
2022	14	28	869,664	1,903,216	840,376	4,327	337,388	82,618	210,884	71,894	1,761,297	22,533,156	20,771,859	8%
2023	14	28	874,371	1,761,297	855,586	4,382	361,005	83,065	208,746	66,349	1,620,495	23,093,712	21,473,217	7%
2024	13	28	876,900	1,620,495	875,171	4,438	386,275	83,305	208,562	60,830	1,479,859	23,657,920	22,178,061	6%
2025	12	29	861,838	1,479,859	908,564	4,493	413,314	81,875	207,056	55,020	1,324,066	24,201,246	22,877,180	5%
2026	12	29	852,642	1,324,066	935,635	4,548	442,246	81,001	205,097	48,767	1,160,994	24,733,473	23,572,479	5%
2027	11	29	843,534	1,160,994	961,929	4,602	473,203	80,136	204,755	42,312	994,868	25,255,576	24,260,708	4%
2028	9	30	799,966	994,868	1,010,905	4,658	506,327	75,997	203,980	35,255	800,864	25,722,661	24,921,797	3%
2029	8	30	740,095	800,864	1,069,011	4,719	541,770	70,309	200,662	26,866	566,741	26,111,364	25,544,623	2%
2030	7	30	702,139	566,741	1,105,399	4,780	579,694	66,703	198,034	17,407	318,401	26,453,924	26,135,523	1%
2031	6	31	643,131	318,401	1,161,588	4,842	620,273	61,097	197,780	7,046	38,167	26,716,830	26,678,663	0%
2032	5	32	547,059	38,167	1,236,729	4,904	955,812	51,971	194,927	756	0	26,854,458	26,854,458	0%
2033	4	32	470,196	0	1,294,269	4,965	1,062,297	44,669	192,269	0	0	26,890,241	26,890,241	0%
2034	4	32	419,741	0	1,332,107	5,025	1,105,493	39,875	191,763	0	0	26,856,725	26,856,725	0%
2035	3	32	367,821	0	1,368,112	5,081	1,145,644	34,943	192,606	0	0	26,752,198	26,752,198	0%
2036	2	32	322,108	0	1,399,996	5,136	1,181,376	30,600	193,156	0	0	26,582,078	26,582,078	0%
2037	2	32	279,997	0	1,424,517	5,188	1,208,127	26,600	194,981	0	0	26,353,072	26,353,072	0%
2038	2	32	236,981	0	1,448,849	5,238	1,235,346	22,513	196,228	0	0	26,062,232	26,062,232	0%
2039	1	31	213,780	0	1,459,491	5,284	1,246,045	20,309	198,421	0	0	25,733,691	25,733,691	0%
2040	1	31	201,547	0	1,461,771	5,326	1,246,634	19,147	201,315	0	0	25,381,486	25,381,486	0%
2041	1	30	179,998	0	1,471,139	5,365	1,256,125	17,100	204,279	20	1,020	24,992,436	24,991,416	0%
2042	1	30	142,396	1,020	1,493,582	5,399	1,305,583	13,528	206,728	573	28,450	24,544,064	24,515,614	0%
2043	1	29	111,809	28,450	1,507,741	5,429	1,396,974	10,622	209,160	3,190	135,225	24,047,070	23,911,845	1%
2044	0	29	84,319	135,225	1,517,204	5,455	1,494,762	8,010	211,684	9,207	336,229	23,505,976	23,169,747	1%
2045	0	28	56,395	336,229	1,525,072	5,477	1,599,395	5,358	213,918	19,155	643,506	22,920,535	22,277,029	3%
2046	0	28	40,096	643,506	1,520,677	5,493	1,711,353	3,809	216,120	33,763	1,082,381	22,307,518	21,225,137	5%
2047	0	27	28,236	1,082,381	1,511,543	5,505	1,831,148	2,682	218,334	53,893	1,671,390	21,673,009	20,001,619	8%
2048	0	26	19,350	1,671,390	1,498,708	5,511	1,959,328	1,838	220,449	80,271	2,429,057	21,021,508	18,592,451	12%
2049	0	26	13,546	2,429,057	1,482,212	5,512	2,096,481	1,287	222,434	113,648	3,375,183	20,357,776	16,982,593	17%
2050	0	25	9,346	3,375,183	1,463,120	5,508	2,243,235	888	224,260	154,806	4,529,744	19,684,804	15,155,060	23%
2051	0	24	5,785	4,529,744	1,442,156	5,498	2,400,261	550	225,857	204,539	5,913,296	19,004,433	13,091,137	31%
2052	0	23	2,900	5,913,296	1,419,363	5,482	2,568,279	276	227,204	263,681	7,547,891	18,318,599	10,770,708	41%
2053	0	23	1,451	7,547,891	1,394,266	5,460	2,748,059	138	228,315	333,142	9,457,819	17,630,207	8,172,388	54%
2054	0	22	587	9,457,819	1,367,557	5,431	2,940,423	56	229,178	413,894	11,668,381	16,941,075	5,272,694	69%
2055	0	21	0	11,668,381	1,339,514	5,397	3,146,253	0	229,778	506,959	14,206,460	16,252,677	2,046,217	87%
2056	0	21	0	14,206,460	1,310,019	5,357	1,861,968	0	230,128	583,640	15,566,821	15,566,821	0	100%
2057	0	20	0	15,566,821	1,279,596	5,311	5,311	0	0	597,332	14,884,557	14,884,557	0	100%

<sup>a</sup> Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

# Alternative Funding on a Closed Group Basis, Table 1(c) (with Additional 15-Year Solvency Test Contributions starting in PYE 2019)

Valuation Plan	Total Assets														
	Number		Total Payroll	Assets							Investment Income	Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Year End 30-Jun	Active		Pay Status	Assets (bo)	Benefit Payments	Expenses	Employer Contributions	Member Contributions <sup>a</sup>	Premium Tax Allocation Contributions					
2017	20	26	\$912,222	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958	\$207,323	\$2,576,530	\$19,919,903	\$17,343,373	13%	
2018	19	26	914,121	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,079	18,024,582	11%	
2019	17	27	901,722	2,255,497	762,678	4,177	285,758	85,664	227,823	86,901	2,174,788	20,867,473	18,692,685	10%	
2020	16	28	878,462	2,174,788	798,545	4,225	305,761	83,454	216,170	83,082	2,060,485	21,426,056	19,365,571	10%	
2021	15	28	872,704	2,060,485	819,276	4,274	327,164	82,907	213,002	78,449	1,938,457	21,980,939	20,042,482	9%	
2022	14	28	869,664	1,938,457	840,376	4,327	350,065	82,618	210,884	73,555	1,810,876	22,533,156	20,722,280	8%	
2023	14	28	874,371	1,810,876	855,586	4,382	374,570	83,065	208,746	68,601	1,685,891	23,093,712	21,407,821	7%	
2024	13	28	876,900	1,685,891	875,171	4,438	400,790	83,305	208,562	63,733	1,562,673	23,657,920	22,095,247	7%	
2025	12	29	861,838	1,562,673	908,564	4,493	428,845	81,875	207,056	58,640	1,426,031	24,201,246	22,775,215	6%	
2026	12	29	852,642	1,426,031	935,635	4,548	458,864	81,001	205,097	53,175	1,283,985	24,733,473	23,449,488	5%	
2027	11	29	843,534	1,283,985	961,929	4,602	490,984	80,136	204,755	47,584	1,140,912	25,255,576	24,114,664	5%	
2028	9	30	799,966	1,140,912	1,010,905	4,658	525,353	75,997	203,980	41,473	972,152	25,722,661	24,750,509	4%	
2029	8	30	740,095	972,152	1,069,011	4,719	562,128	70,309	200,662	34,121	765,642	26,111,364	25,345,722	3%	
2030	7	30	702,139	765,642	1,105,399	4,780	601,477	66,703	198,034	25,794	547,472	26,453,924	25,906,452	2%	
2031	6	31	643,131	547,472	1,161,588	4,842	643,580	61,097	197,780	16,671	300,170	26,716,830	26,416,660	1%	
2032	5	32	547,059	300,170	1,236,729	4,904	688,631	51,971	194,927	5,945	11	26,854,458	26,854,447	0%	
2033	4	32	470,196	11	1,294,269	4,965	1,062,286	44,669	192,269	0	0	26,890,241	26,890,241	0%	
2034	4	32	419,741	0	1,332,107	5,025	1,105,493	39,875	191,763	0	0	26,856,725	26,856,725	0%	
2035	3	32	367,821	0	1,368,112	5,081	1,145,644	34,943	192,606	0	0	26,752,198	26,752,198	0%	
2036	2	32	322,108	0	1,399,996	5,136	1,181,376	30,600	193,156	0	0	26,582,078	26,582,078	0%	
2037	2	32	279,997	0	1,424,517	5,188	1,208,124	26,600	194,981	0	0	26,353,072	26,353,072	0%	
2038	2	32	236,981	0	1,448,849	5,238	1,235,346	22,513	196,228	0	0	26,062,232	26,062,232	0%	
2039	1	31	213,780	0	1,459,491	5,284	1,246,045	20,309	198,421	0	0	25,733,691	25,733,691	0%	
2040	1	31	201,547	0	1,461,771	5,326	1,246,634	19,147	201,315	0	0	25,381,486	25,381,486	0%	
2041	1	30	179,998	0	1,471,139	5,365	1,266,019	17,100	204,279	216	11,110	24,992,436	24,981,326	0%	
2042	1	30	142,396	11,110	1,493,582	5,399	1,354,640	13,528	206,728	1,948	88,972	24,544,064	24,455,092	0%	
2043	1	29	111,809	88,972	1,507,741	5,429	1,449,465	10,622	209,160	6,650	251,698	24,047,070	23,795,372	1%	
2044	0	29	84,319	251,698	1,517,204	5,455	1,550,928	8,010	211,684	14,978	514,639	23,505,976	22,991,337	2%	
2045	0	28	56,395	514,639	1,525,072	5,477	1,659,493	5,358	213,918	27,482	890,341	22,920,535	22,030,194	4%	
2046	0	28	40,096	890,341	1,520,677	5,493	1,775,658	3,809	216,120	44,910	1,404,668	22,307,518	20,902,850	6%	
2047	0	27	28,236	1,404,668	1,511,543	5,505	1,899,954	2,682	218,334	68,147	2,076,737	21,673,009	19,596,272	10%	
2048	0	26	19,350	2,076,737	1,498,708	5,511	2,032,951	1,838	220,449	97,943	2,925,699	21,021,508	18,095,809	14%	
2049	0	26	13,546	2,925,699	1,482,212	5,512	2,175,258	1,287	222,434	135,074	3,972,028	20,357,776	16,385,748	20%	
2050	0	25	9,346	3,972,028	1,463,120	5,508	2,327,526	888	224,260	180,349	5,236,423	19,684,804	14,448,381	27%	
2051	0	24	5,785	5,236,423	1,442,156	5,498	2,490,453	550	225,857	234,593	6,740,221	19,004,433	12,264,212	35%	
2052	0	23	2,900	6,740,221	1,419,363	5,482	2,664,785	276	227,204	298,669	8,506,310	18,318,599	9,812,289	46%	
2053	0	23	1,451	8,506,310	1,394,266	5,460	2,851,320	138	228,315	373,524	10,559,881	17,630,207	7,070,326	60%	
2054	0	22	587	10,559,881	1,367,557	5,431	3,050,912	56	229,178	460,165	12,927,203	16,941,075	4,013,872	76%	
2055	0	21	0	12,927,203	1,339,514	5,397	3,264,476	0	229,778	559,653	15,636,199	16,252,677	616,478	96%	
2056	0	21	0	15,636,199	1,310,019	5,357	403,915	0	230,128	611,955	15,566,821	15,566,821	0	100%	
2057	0	20	0	15,566,821	1,279,596	5,311	5,311	0	0	597,332	14,884,557	14,884,557	0	100%	

<sup>a</sup> Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

# Alternative Funding on an Open Group Basis, Table 1(d) (with Recommended Solvency Contributions starting in PYE 2019)

Valuation Plan Year End 30-Jun	Number		Total Assets										Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status	Total Payroll	Assets (boy)	Benefit Payments	Expenses	Employer Contributions	Member Contributions <sup>a</sup>	Premium Tax Allocation Contributions	Investment Income	Assets (eoy)				
2017	20	26	\$912,222	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958	\$207,323	\$2,576,530	\$19,919,903	\$17,343,373	13%	
2018	20	26	914,121	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,080	18,024,583	11%	
2019	20	27	934,207	2,255,497	762,678	4,271	342,588	88,967	227,823	88,090	2,236,016	20,886,351	18,650,335	11%	
2020	20	28	969,470	2,236,016	798,678	4,476	366,569	92,508	237,787	87,336	2,217,062	21,498,401	19,281,339	10%	
2021	20	28	1,012,737	2,217,062	819,883	4,638	392,229	96,566	244,055	86,867	2,212,258	22,136,998	19,924,740	10%	
2022	20	28	1,055,049	2,212,258	841,755	4,791	419,685	100,561	250,037	86,980	2,222,974	22,802,122	20,579,148	10%	
2023	20	28	1,108,402	2,222,974	857,923	4,950	449,063	105,675	256,276	87,892	2,259,007	23,507,760	21,248,753	10%	
2024	20	28	1,150,552	2,259,007	878,618	5,081	480,497	109,673	261,903	89,734	2,317,114	24,245,202	21,928,088	10%	
2025	20	29	1,189,108	2,317,114	913,220	5,249	514,132	113,497	268,630	92,244	2,387,148	24,999,131	22,611,983	10%	
2026	20	29	1,243,461	2,387,148	941,635	5,434	550,121	118,821	275,931	95,442	2,480,394	25,786,461	23,306,067	10%	
2027	20	29	1,288,352	2,480,394	969,505	5,584	588,629	123,115	282,399	99,593	2,599,041	26,604,239	24,005,198	10%	
2028	20	30	1,311,402	2,599,041	1,020,258	5,767	629,833	125,467	290,068	104,345	2,722,729	27,416,404	24,693,675	10%	
2029	20	30	1,349,732	2,722,729	1,080,372	6,031	673,921	129,422	300,354	109,252	2,849,275	28,219,713	25,370,438	10%	
2030	20	31	1,407,354	2,849,275	1,119,157	6,269	721,095	135,012	309,838	114,773	3,004,567	29,047,357	26,042,790	10%	
2031	20	31	1,429,691	3,004,567	1,178,172	6,465	771,572	137,173	318,193	121,020	3,167,888	29,860,182	26,692,294	11%	
2032	20	32	1,451,869	3,167,888	1,256,405	6,751	825,582	139,682	329,543	127,342	3,326,881	30,636,464	27,309,583	11%	
2033	20	32	1,500,478	3,326,881	1,317,382	7,037	883,373	144,562	341,379	133,964	3,505,740	31,407,009	27,901,269	11%	
2034	20	32	1,559,943	3,505,740	1,359,186	7,269	945,209	150,327	351,561	141,827	3,728,209	32,198,914	28,470,705	12%	
2035	20	33	1,612,260	3,728,209	1,399,507	7,478	1,011,374	155,490	361,715	151,537	4,001,340	33,010,512	29,009,172	12%	
2036	20	32	1,680,673	4,001,340	1,436,040	7,706	1,082,170	162,325	372,583	163,486	4,338,158	33,856,201	29,518,043	13%	
2037	20	32	1,742,348	4,338,158	1,465,673	7,895	1,157,922	168,199	382,266	178,176	4,751,154	34,740,403	29,989,249	14%	
2038	20	32	1,814,445	4,751,154	1,495,444	8,110	1,238,977	174,703	393,344	196,056	5,250,679	35,669,785	30,419,106	15%	
2039	20	32	1,895,478	5,250,679	1,512,329	8,306	1,325,705	181,789	403,804	217,764	5,859,107	36,661,602	30,802,495	16%	
2040	20	32	1,979,721	5,859,107	1,525,088	8,496	1,418,504	189,450	414,294	244,041	6,591,812	37,722,721	31,130,909	17%	
2041	20	32	2,054,139	6,591,812	1,550,881	8,693	1,517,799	196,275	425,062	275,150	7,446,523	38,838,586	31,392,063	19%	
2042	20	32	2,125,203	7,446,523	1,594,101	8,924	1,624,045	202,883	437,135	310,952	8,418,512	39,993,372	31,574,860	21%	
2043	20	32	2,209,215	8,418,512	1,633,134	9,168	1,737,728	210,687	449,595	351,707	9,525,928	41,200,433	31,674,505	23%	
2044	20	32	2,289,082	9,525,928	1,672,010	9,394	1,859,369	217,838	461,614	398,017	10,781,362	42,459,897	31,678,535	25%	
2045	20	31	2,377,149	10,781,362	1,713,388	9,647	1,989,525	225,887	474,472	450,402	12,198,614	43,774,814	31,576,200	28%	
2046	20	31	2,472,241	12,198,614	1,747,859	9,892	2,128,792	234,537	487,168	509,585	13,800,945	45,157,294	31,356,349	31%	
2047	20	31	2,570,022	13,800,945	1,783,367	10,138	2,277,807	243,065	499,956	576,343	15,604,611	46,610,927	31,006,316	33%	
2048	20	31	2,668,092	15,604,611	1,820,516	10,392	2,437,253	251,437	513,188	651,335	17,626,917	48,134,556	30,507,639	37%	
2049	20	31	2,767,322	17,626,917	1,861,706	10,660	2,607,861	260,334	527,006	735,235	19,884,987	49,725,569	29,840,582	40%	
2050	20	31	2,870,946	19,884,987	1,909,747	10,941	2,790,411	269,799	541,474	828,689	22,394,672	51,385,167	28,990,495	44%	
2051	20	31	2,976,610	22,394,672	1,962,373	11,229	2,985,740	279,063	556,276	932,374	25,174,523	53,114,790	27,940,267	47%	
2052	20	31	3,082,726	25,174,523	2,017,311	11,529	3,194,742	288,431	571,680	1,047,104	28,247,640	54,911,501	26,663,861	51%	
2053	20	31	3,193,034	28,247,640	2,077,293	11,845	3,418,374	298,551	587,869	1,173,784	31,637,080	56,774,665	25,137,585	56%	
2054	20	31	3,307,400	31,637,080	2,143,367	12,170	3,657,660	309,170	604,544	1,313,327	35,366,244	58,705,390	23,339,146	60%	
2055	20	31	3,426,415	35,366,244	2,213,628	12,503	3,913,696	320,274	621,771	1,466,726	39,462,580	60,706,220	21,243,640	65%	
2056	20	31	3,549,844	39,462,580	2,286,812	12,843	4,187,655	331,774	639,445	1,635,127	43,956,926	62,779,522	18,822,596	70%	
2057	20	31	3,677,709	43,956,926	2,363,729	13,192	4,480,791	343,732	657,645	1,819,773	48,881,946	64,927,492	16,045,546	75%	

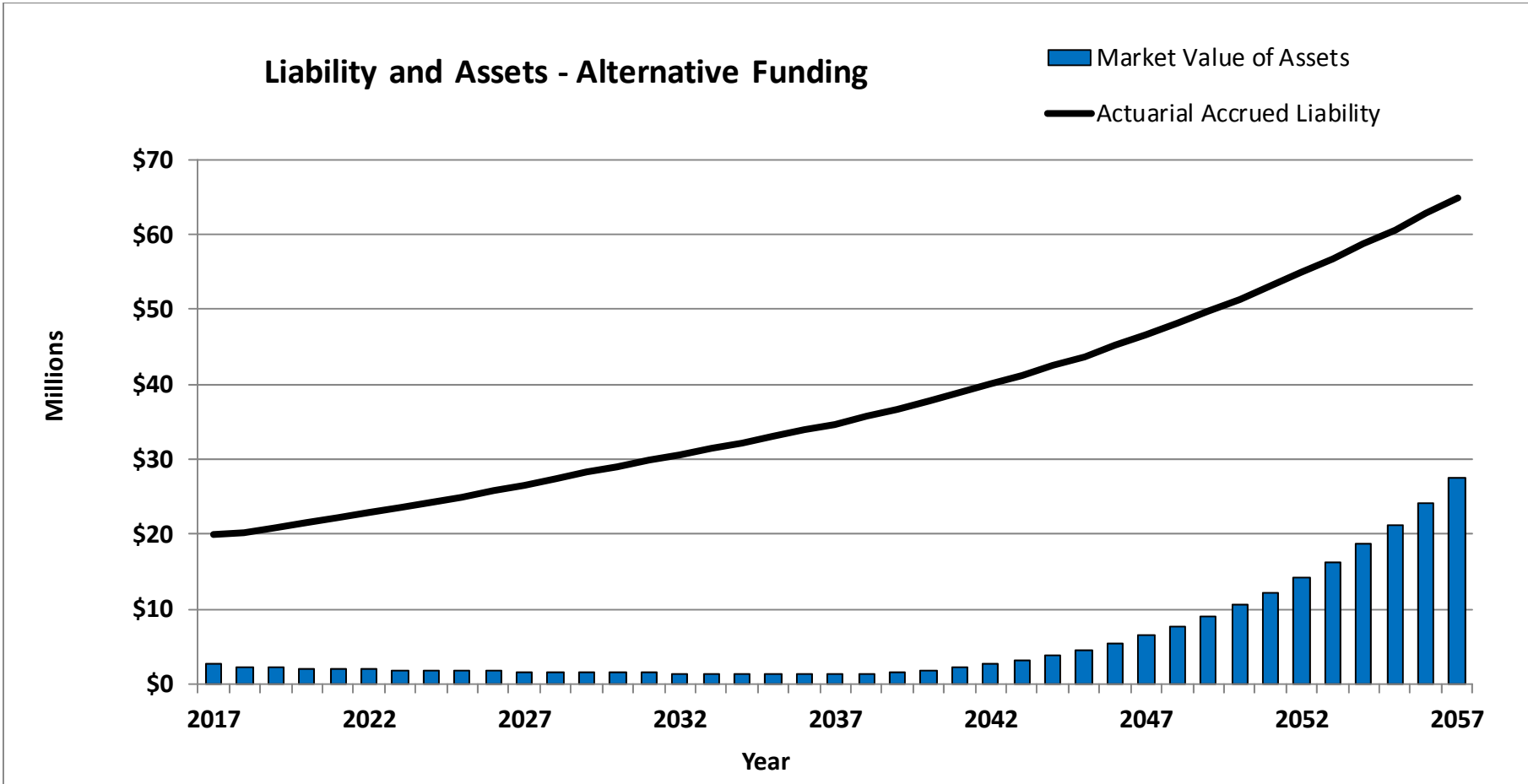
<sup>a</sup> Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

## Alternative Funding on a Closed Group Basis, Table 1(e) (with Recommended Solvency Contributions starting in PYE 2019)

Valuation Plan Year End 30-Jun	Number		Total Payroll	Total Assets								Assets (eoy)	Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status		Assets (boy)	Benefit Payments	Expenses	Employer Contributions	Member Contributions <sup>a</sup>	Premium Tax Allocation Contributions	Investment Income					
	2017	20		26	\$912,222	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958				
2018	19	26	914,121	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,079	18,024,582	11%	
2019	17	27	901,722	2,255,497	762,678	4,177	342,588	85,664	227,823	88,026	2,232,743	20,867,473	18,634,730	11%	
2020	16	28	878,462	2,232,743	798,545	4,225	366,569	83,454	216,170	86,605	2,182,771	21,426,056	19,243,285	10%	
2021	15	28	872,704	2,182,771	819,276	4,274	392,229	82,907	213,002	84,629	2,131,988	21,980,939	19,848,951	10%	
2022	14	28	869,664	2,131,988	840,376	4,327	419,685	82,618	210,884	82,675	2,083,147	22,533,156	20,450,009	9%	
2023	14	28	874,371	2,083,147	855,586	4,382	449,063	83,065	208,746	80,967	2,045,021	23,093,712	21,048,691	9%	
2024	13	28	876,900	2,045,021	875,171	4,438	480,497	83,305	208,562	79,677	2,017,454	23,657,920	21,640,466	9%	
2025	12	29	861,838	2,017,454	908,564	4,493	514,132	81,875	207,056	78,520	1,985,979	24,201,246	22,215,267	8%	
2026	12	29	852,642	1,985,979	935,635	4,548	550,121	81,001	205,097	77,380	1,959,395	24,733,473	22,774,078	8%	
2027	11	29	843,534	1,959,395	961,929	4,602	588,629	80,136	204,755	76,534	1,942,917	25,255,576	23,312,659	8%	
2028	9	30	799,966	1,942,917	1,010,905	4,658	629,833	75,997	203,980	75,623	1,912,787	25,722,661	23,809,874	7%	
2029	8	30	740,095	1,912,787	1,069,011	4,719	673,921	70,309	200,662	73,960	1,857,909	26,111,364	24,253,455	7%	
2030	7	30	702,139	1,857,909	1,105,399	4,780	721,095	66,703	198,034	71,854	1,805,417	26,453,924	24,648,507	7%	
2031	6	31	643,131	1,805,417	1,161,588	4,842	771,572	61,097	197,780	69,523	1,738,959	26,716,830	24,977,871	7%	
2032	5	32	547,059	1,738,959	1,236,729	4,904	825,582	51,971	194,927	66,209	1,636,015	26,854,458	25,218,443	6%	
2033	4	32	470,196	1,636,015	1,294,269	4,965	883,373	44,669	192,269	61,897	1,518,988	26,890,241	25,371,253	6%	
2034	4	32	419,741	1,518,988	1,332,107	5,025	945,209	39,875	191,763	57,585	1,416,289	26,856,725	25,440,436	5%	
2035	3	32	367,821	1,416,289	1,368,112	5,081	1,011,374	34,943	192,606	53,993	1,336,012	26,752,198	25,416,186	5%	
2036	2	32	322,108	1,336,012	1,399,996	5,136	1,082,170	30,600	193,156	51,476	1,288,282	26,582,078	25,293,796	5%	
2037	2	32	279,997	1,288,282	1,424,517	5,188	1,157,922	26,600	194,981	50,537	1,288,617	26,353,072	25,064,455	5%	
2038	2	32	236,981	1,288,617	1,448,849	5,238	1,238,977	22,513	196,228	51,617	1,343,865	26,062,232	24,718,367	5%	
2039	1	31	213,780	1,343,865	1,459,491	5,284	1,325,705	20,309	198,421	55,333	1,478,858	25,733,691	24,254,833	6%	
2040	1	31	201,547	1,478,858	1,461,771	5,326	1,418,504	19,147	201,315	62,558	1,713,285	25,381,486	23,668,201	7%	
2041	1	30	179,998	1,713,285	1,471,139	5,365	1,517,799	17,100	204,279	73,733	2,049,692	24,992,436	22,942,744	8%	
2042	1	30	142,396	2,049,692	1,493,582	5,399	1,624,045	13,528	206,728	88,827	2,483,838	24,544,064	22,060,226	10%	
2043	1	29	111,809	2,483,838	1,507,741	5,429	1,737,728	10,622	209,160	108,153	3,036,330	24,047,070	21,010,740	13%	
2044	0	29	84,319	3,036,330	1,517,204	5,455	1,859,369	8,010	211,684	132,472	3,725,206	23,505,976	19,780,770	16%	
2045	0	28	56,395	3,725,206	1,525,072	5,477	1,989,525	5,358	213,918	162,440	4,565,898	22,920,535	18,354,637	20%	
2046	0	28	40,096	4,565,898	1,520,677	5,493	2,128,792	3,809	216,120	198,925	5,587,374	22,307,518	16,720,144	25%	
2047	0	27	28,236	5,587,374	1,511,543	5,505	2,277,807	2,682	218,334	242,938	6,812,087	21,673,009	14,860,922	31%	
2048	0	26	19,350	6,812,087	1,498,708	5,511	2,437,253	1,838	220,449	295,363	8,262,771	21,021,508	12,758,737	39%	
2049	0	26	13,546	8,262,771	1,482,212	5,512	2,607,861	1,287	222,434	357,124	9,963,753	20,357,776	10,394,023	49%	
2050	0	25	9,346	9,963,753	1,463,120	5,508	2,790,411	888	224,260	429,185	11,939,869	19,684,804	7,744,935	61%	
2051	0	24	5,785	11,939,869	1,442,156	5,498	2,985,740	550	225,857	512,539	14,216,900	19,004,433	4,787,533	75%	
2052	0	23	2,900	14,216,900	1,419,363	5,482	3,194,742	276	227,204	608,232	16,822,509	18,318,599	1,496,090	92%	
2053	0	23	1,451	16,822,509	1,394,266	5,460	3,303,453	138	228,315	675,518	17,630,207	17,630,207	0	100%	
2054	0	22	587	17,630,207	1,367,557	5,431	5,669	56	0	678,131	16,941,075	16,941,075	0	100%	
2055	0	21	0	16,941,075	1,339,514	5,397	5,398	0	0	651,115	16,252,677	16,252,677	0	100%	
2056	0	21	0	16,252,677	1,310,019	5,357	5,356	0	0	624,164	15,566,821	15,566,821	0	100%	
2057	0	20	0	15,566,821	1,279,596	5,311	5,311	0	0	597,332	14,884,557	14,884,557	0	100%	

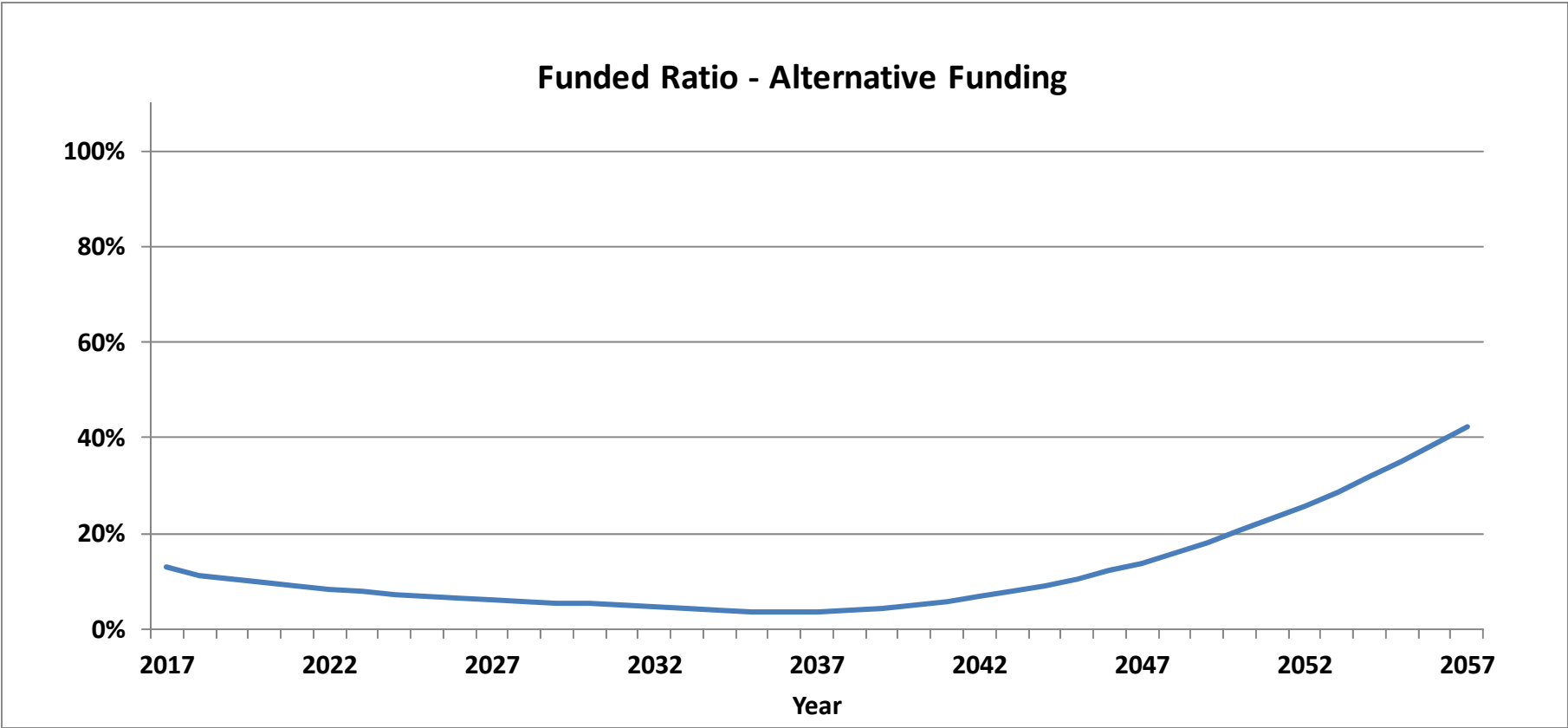
<sup>a</sup> Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

# Open Group Actuarial Projections – Alternative Funding, Graph 2 (with no Additional Solvency)

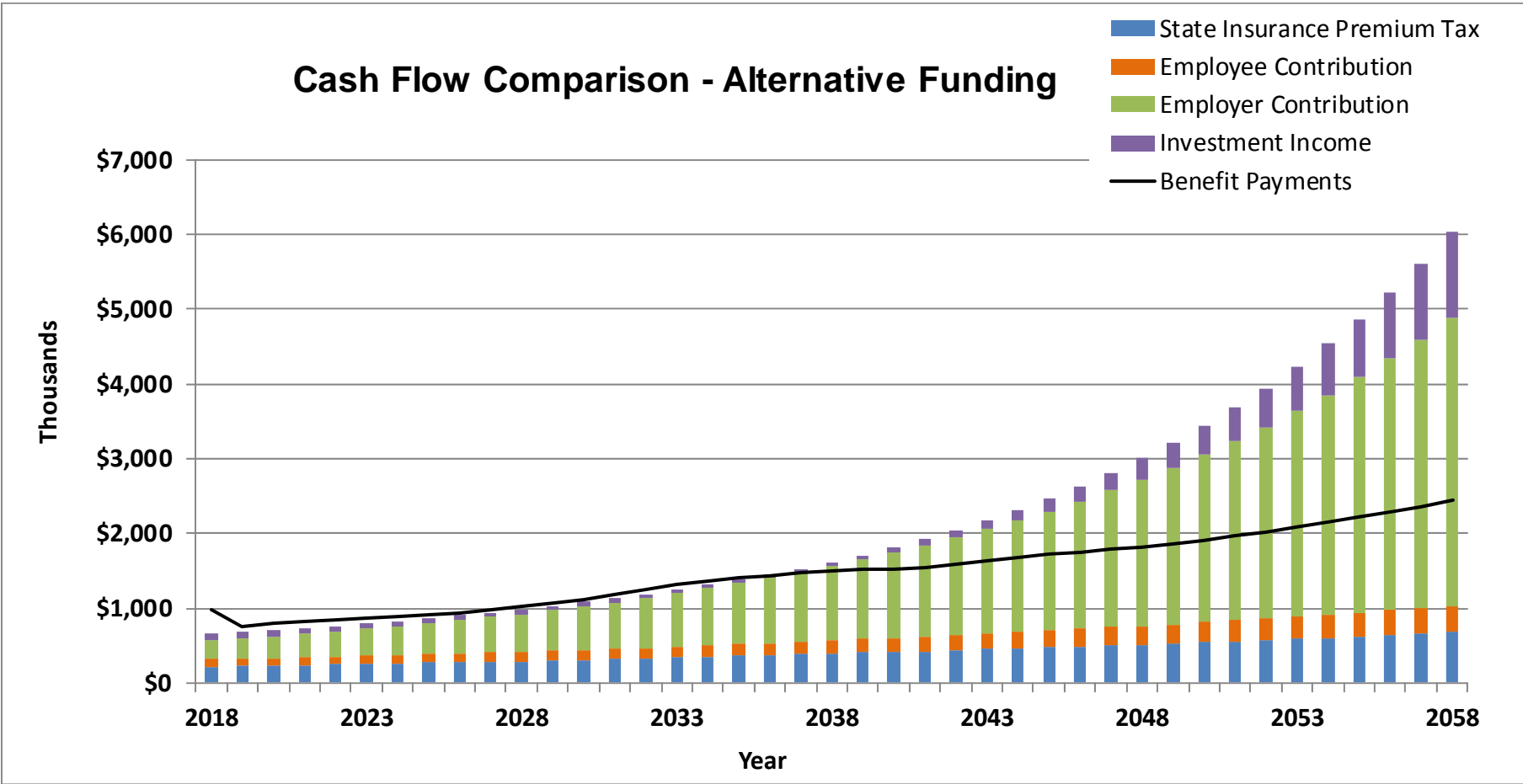




# Open Group Actuarial Projections – Alternative Funding, Graph 3 (with no Additional Solvency)



# Open Group Actuarial Projections – Alternative Funding, Graph 4 (with no Additional Solvency)



**SECTION III**

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**FUNDING POLICY CHOICES**

# Actuarial Projections –Alternative/Optional/Conservation Funding

## Funding Policy Choices

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

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

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

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

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

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

- The first asset account (Benefit Payment Account) is used to finance benefits and expenses for the fiscal year on a pay-as-you-go basis. Sources to pay current year benefits and expenses include active member employee contributions in excess of 1.5% of pay, a portion of the premium tax allocation not assigned to the accumulation account as defined below, and employer contributions.
- The second account (Accumulation Account) cannot be used to pay benefits and expenses until assets exceed actuarial accrued liabilities. Contributions to the accumulation account include employee contributions of 1.5% of pay and a percentage of the premium tax allocation. The percentage of the 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 the 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 12.9% and that the ratio of assets to expected benefits for the year is only 2.62, we strongly recommend that the sponsor make additional contributions in excess of the statutory minimum under both the Alternative and Conservation funding policies.

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

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

<b>Total Employer Contributions for FYE June 30, 2019</b>				
	<b>Local Plan</b>		<b>Statewide Plan</b>	
<b>Funding Method</b>	<b>Amount</b>	<b>Percent of Pay</b>	<b>Amount</b>	<b>Percent of Pay</b>
Alternative	\$275,409	29.5%	NA	NA
Optional	\$1,185,328	131.5%	\$3,411	10.5%
Conservation	\$553,226	61.4%	\$3,411	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 \$257,392 in fiscal year end 2018 to \$3,602,145 in fiscal year end 2057. In fiscal year end 2057, the plan is projected to be 42% 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 \$275,409 to \$1,185,328. However, over the 40-year projection period, total employer contributions to both the local plan and the statewide plan are projected to decrease from \$1,188,739 in fiscal year end 2019 to \$719,682 in fiscal year end 2049, and the Plan is projected to be fully funded in 2050.

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

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If the Conservation funding policy is selected in fiscal year end 2019, employer contributions to the local plan for fiscal year end 2019 are projected to increase from \$275,409 to \$553,226. During the 35-year projection period, total employer contributions to both the local plan and the statewide plan are projected to increase from \$556,637 in fiscal year end 2019 to \$1,413,650 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 significantly lower funded ratio when compared to either the Optional funding policy or the Conservation funding policy, and the 7% annual increases in employer contributions may eventually be cost prohibitive.

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

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

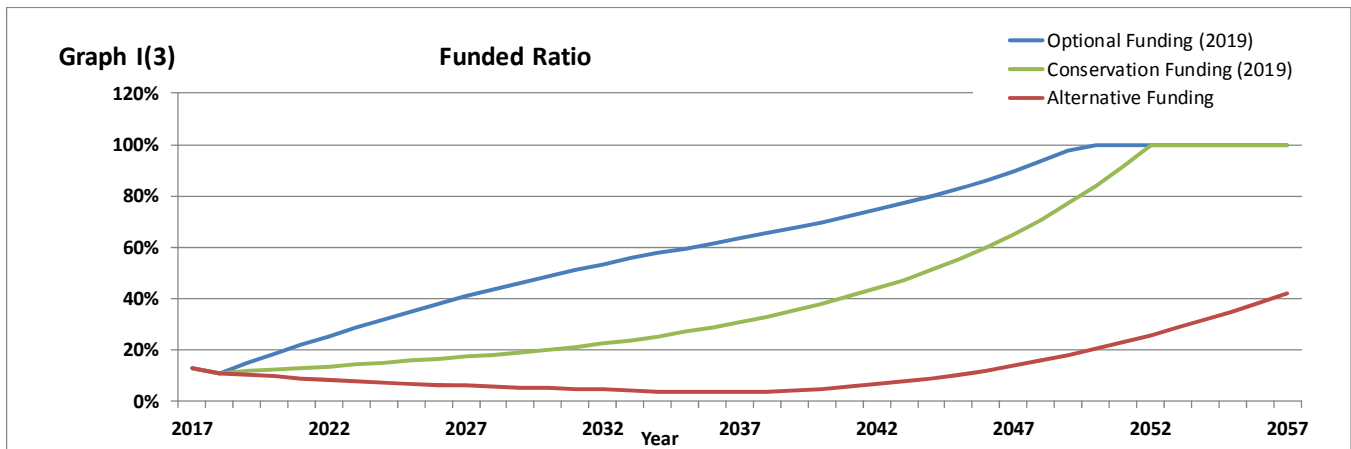
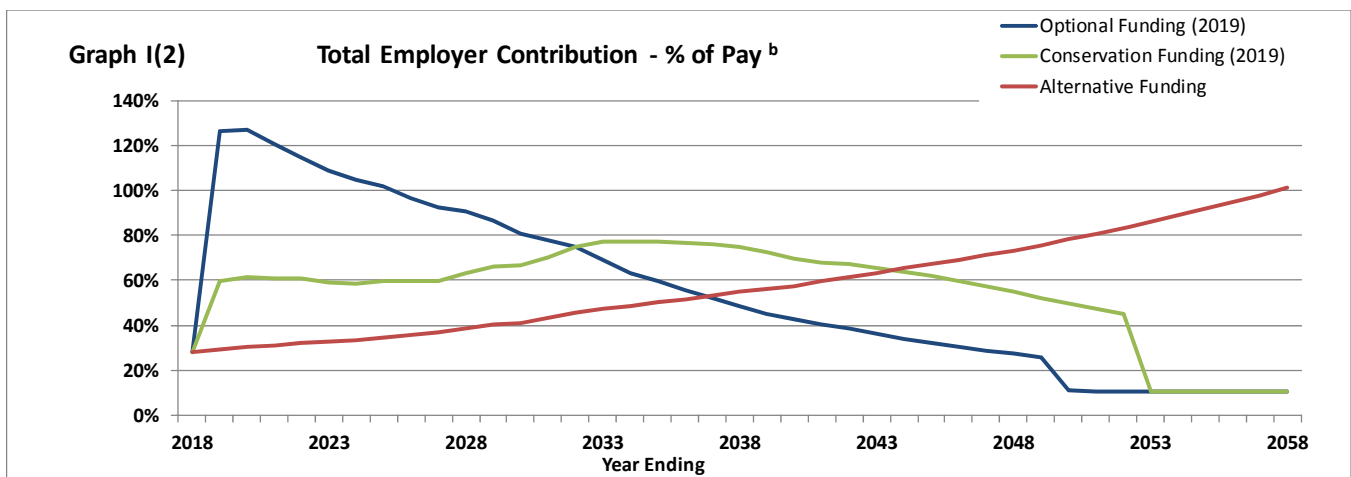
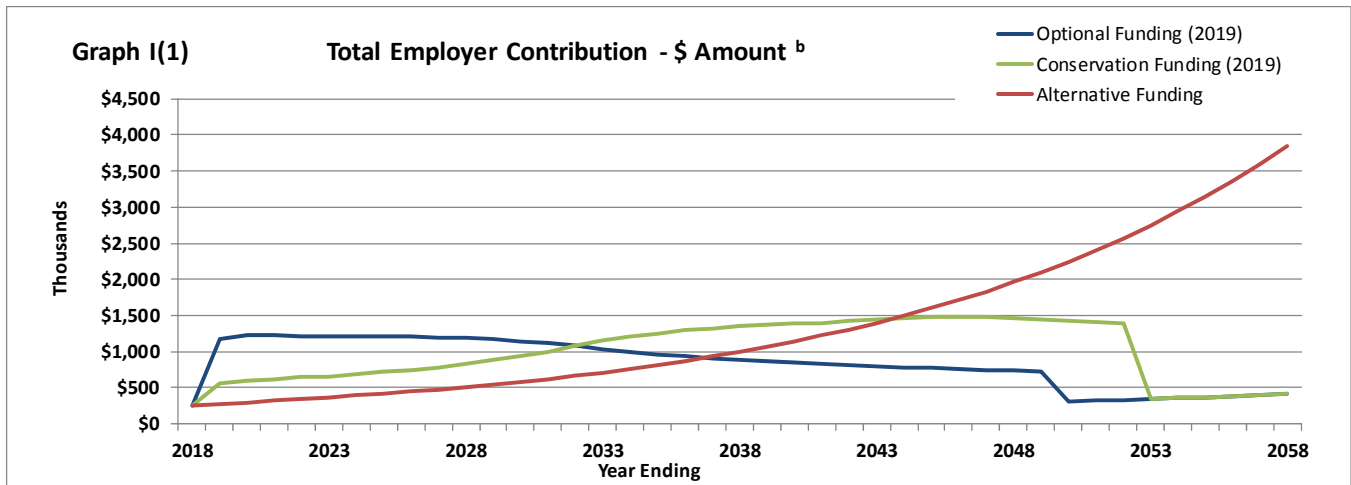
Under Scenario II, the plan sponsor is assumed to make contributions under the Alternative funding policy in future years, until the first year that either the Optional or Conservation policy produces a lower contribution. Under this assumption, the employer contributions under the Optional funding policy are not projected to be lower than contributions under the Alternative funding policy. In plan year end 2042, the employer contributions under the Conservation funding policy of \$1,280,878 are projected to be lower than contributions under the Alternative funding policy of \$1,305,583.

Graphs II(1), II(2), and III(3) show the projected contribution pattern and funded ratio. Based on these projections, the Conservation funding policy has lower projected employer contributions than the Alternative funding policy beginning in 2042. After 2042, 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<sup>a</sup> (Continued)

## Scenario I

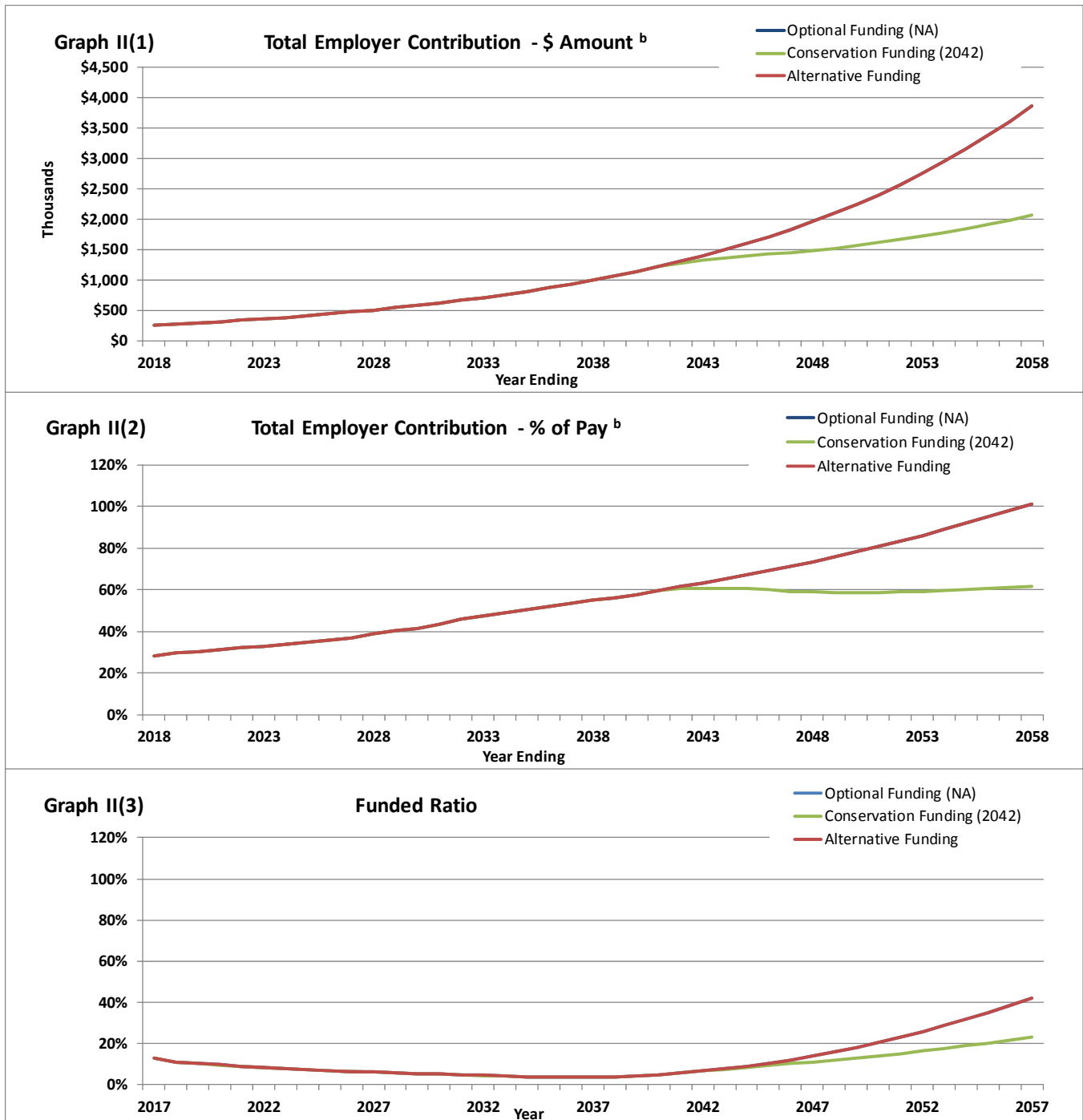


<sup>a</sup> Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019. Alternative funding projections based on Table 1(a).

<sup>b</sup> Based on total pay and includes contributions for future members projected to participate in the statewide plan.

# Actuarial Projections –Alternative/Optional/Conservation Funding<sup>a</sup> (Continued)

## Scenario II



<sup>a</sup> 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.

<sup>b</sup> Based on total pay and includes contributions for future members projected to participate in the statewide plan.



## **SECTION IV**

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

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

## Schedule C: Funding Progress and Employer Contributions

Valuation Date	July 1, 2016	July 1, 2017
Valuation Interest Rate	4.00%	4.00%
Cost-of-Living Adjustment	2.75%	2.75%
Wage Inflation	3.75%	3.75%
Actuarial Value of Assets	Market	Market
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Remaining Amortization Period <sup>a</sup>	24 Years, Level % of Pay	23 Years, Level % of Pay
<b>Schedule of Funding Progress</b>		
Actuarial Valuation Date	July 1, 2016	July 1, 2017
1. Market Value of Assets	\$2,444,156	\$2,576,530
2. Actuarial Accrued Liability	\$19,315,144	\$19,919,903
3. Unfunded Actuarial Accrued Liability (2 - 1)	\$16,870,988	\$17,343,373
4. Funded Ratio (1/2)	13%	13%
5. Expected Payroll	\$912,222	\$914,121
6. UAAL as Percentage of Covered Payroll (3/5)	1,849%	1,897%
<b>Schedule of Employer Contributions <sup>c</sup></b>		
1. Actuarially Determined Contribution	FYE 2017	FYE 2018
(a) Employer Normal Cost	\$456,692	\$468,968
(b) Amortization of Unfunded Actuarial Accrued Liability	\$722,585	\$774,191
(c) Actuarially Determined Contribution (ADC) (a + b)	\$1,179,277	\$1,243,159
2. Employer Contribution <sup>b</sup>	\$241,363	\$257,392
3. Premium Tax Allocation	\$207,958	\$219,396
4. Percentage of ADC Contributed [ (2 + 3)/1(c)]	38%	38%

<sup>a</sup> Suggested amortization policy to comply with GASB Statement Nos. 67 and 68 Standards.

<sup>b</sup> Estimated employer contribution for fiscal year end June 30, 2018.

<sup>c</sup> 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**

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### **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	\$2,615,950	\$2,444,156
Adjustment to Market Value of Assets at Beginning of Year	\$0	\$0
Market Value of Assets Beginning of Year	\$2,615,950	\$2,444,156
1. Revenue During Fiscal Year		
(a) Employee Contribution	\$99,072	\$94,205
(b) Governmental Contribution		
(i) From Local Government	\$224,816	\$241,363
(ii) From State Government	\$209,613	\$207,958
(iii) Reallocation from State Government	\$0	\$0
(iv) Total	\$434,429	\$449,321
(c) Earnings on Investments		
(i) Net Appreciation/(Depreciation)	(\$99,658)	\$144,370
(ii) Bond Interest	\$15,732	\$13,644
(iii) Dividends	\$36,128	\$26,043
(iv) Net Realized Gain (Loss) on Sale/Exchange	\$12,946	\$38,799
(v) Other	\$0	\$0
(vi) Less Investment Expense	(\$18,217)	(\$15,533)
(vii) Total	(\$53,069)	\$207,323
(d) Other Revenue	\$0	\$0
(e) Receivable Investment Income/(Expense)	\$0	\$0
(f) Receivable Contribution <sup>a</sup>		
(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))	\$480,432	\$750,849
2. Expenditures During Fiscal Year		
(a) Benefits Paid	\$646,025	\$617,725
(b) Withdrawals	\$0	\$0
(c) Administrative Expenses	\$6,201	\$750
(d) Payable Benefits and Withdrawals	\$0	\$0
(e) Payable Administrative Expenses	\$0	\$0
(f) Total Expenditures (sum of (a) through (e))	\$652,226	\$618,475
B. Market Value of Assets End of Year		
[A + 1(g) - 2(f)]	\$2,444,156	\$2,576,530
C. Approximate Return on Assets	(2.32)%	8.58%

<sup>a</sup> 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	\$400,006	16%	\$523,449	20%
2. Government Securities				
(a) US Treasury Bills, Notes and Bonds	\$196,646		\$144,892	
(b) US State and Local Governmental Debt Securities	\$0		\$229,849	
(c) Foreign Governmental Debt Securities	\$0		\$0	
(d) Other	\$219,061		\$0	
(e) Total Government Securities (sum of (a) through (d) )	\$415,707	17%	\$374,741	15%
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)	\$0		\$138,165	
(d) US Exchange Traded Funds (Bonds)	\$0		\$0	
(e) International Bonds	\$0		\$0	
(f) International Mutual Fund Shares (Bonds)	\$0		\$0	
(g) International Exchange Traded Funds (Bonds)	\$0		\$0	
(h) Total Corporate Fixed Income (sum of (a) through (g) )	\$0	0%	\$138,165	5%
4. Corporate Equity				
(a) US Equity	\$292,477		\$62,494	
(b) US Mutual Fund Shares (Equity)	\$0		\$0	
(c) US Exchange Traded Funds (Equity)	\$613,396		\$655,198	
(d) International Equity	\$388,969		\$464,948	
(e) International Mutual Fund Shares (Equity)	\$0		\$0	
(f) International Exchange Traded Funds (Equity)	\$0		\$5,899	
(g) Total Corporate Equity (sum of (a) through (f) )	\$1,294,842	53%	\$1,188,539	46%
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	\$333,601		\$351,636	
(e) Total Alternative Investments (sum of (a) through (d) )	\$333,601	14%	\$351,636	14%
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%
<b>Market Value of Assets End of Year</b>	<b>\$2,444,156</b>		<b>\$2,576,530</b>	
<b>[ sum of (1) through (8) ]</b>				

## Actuarial Valuation Data as of July 1, 2017

### Schedule F: Summary of Participant Activity

	Actives	Retirees	Disabled	Deferred Vested	Spouses and Beneficiaries	Totals
<b>Total Participants July 1, 2016:</b>	<b>20</b>	<b>14</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>45</b>
New Actives:	1					1
Returned to Actives Status:						0
Data Corrections/Other Changes:						0
Vested Terminations:						0
Non-Vested Terminations:						0
Disabled:	(1)		1			0
Retirements:						0
Deaths with Beneficiary:						0
Deaths w/o Beneficiary:						0
Expired Annuity or Stop Payment:						0
Net Changes:	0	0	1	0	0	1
<b>Total Participants June 30, 2017:</b>	<b>20</b>	<b>14</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>46</b>

## Actuarial Valuation Data as of July 1, 2017

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

Attained Age	Years of Service to Valuation Date									Totals	Valuation Payroll <sup>a</sup>
	Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 35		
Under 20											\$ 0
20-24		1								1	\$ 36,316
25-29			1	1						2	\$ 81,991
30-34	1			1						2	\$ 81,244
35-39			5	1	2					8	\$ 355,183
40-44			1		2	1				4	\$ 191,756
45-49							1			1	\$ 67,753
50-54						1				1	\$ 49,689
55-59					1					1	\$ 44,375
60-64											\$ 0
65-69											\$ 0
Over 70											\$ 0
<b>Totals</b>	<b>1</b>	<b>2</b>	<b>8</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>\$ 908,308</b>
<b>Averages</b> _____											
Age: 38.2 years											
Service: 11.5 years											
Annual Pay: \$45,415 <sup>a</sup>											

<sup>a</sup>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	20	20
Total Annual Pay <sup>a</sup>	\$906,461	\$908,308
Average Age	37.8	38.2
Average Service	11.4	11.5

<sup>a</sup> Excludes annual pay for 2 members participating in the DROP.

Inactive Participants	July 1, 2016		July 1, 2017 <sup>b</sup>	
Type	No.	Annual Benefit	No.	Annual Benefit
Retirees <sup>c</sup>	14	\$473,101	14	\$476,040
Survivors	6	\$92,108	6	\$93,237
Disabled Members	5	\$122,710	6	\$149,769
Deferred Vested Members	0	\$0	0	\$0

<sup>b</sup> Data provided includes 2 non-vested members with accumulated contribution balances of \$5,413 as of June 30, 2017

<sup>c</sup> Retiree data as of July 1, 2016, and as of July 1, 2017, includes 2 members classified as DROP members with accumulated DROP balances of \$147,433 as of June 30, 2016, and \$245,002 as of June 30, 2017.



## **SECTION VI**

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### **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 <sup>1</sup>	Liquidity Ratio <sup>2</sup>	Equity Exposure <sup>3</sup>	Projected Funded Ratio after 15 Years <sup>1</sup>	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%

<sup>1</sup>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).

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

<sup>3</sup>Based on investment policy.

As of June 30, 2017	
Assets	\$2,576,530
Liabilities using a 5.50% discount rate	\$16,054,161
Funded Ratio	16%
Expected Benefit Payments	\$984,623
Liquidity Ratio	2.62
Equity Exposure	46%
Projected Funded Ratio after 15 years	8%

Discount Rate

4.00%

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

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**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 St. Albans Firemen’s Pension and Relief Fund reported 22 eligible active members and 25 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 \$227,823 for the fiscal year ending June 30, 2019.
- (6) The total premium tax allocation was assumed to increase by 2.75% in calendar years ending on and after 2019.

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

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

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

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

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

Administrative Expenses	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	Valued 2 individuals participating in the DROP as retired members. DROP members are assumed to retire as of June 30, 2018, and receive a distribution of their DROP balance as of June 30, 2018.
Child Beneficiaries	Future survivor widow benefits are loaded by 12% to estimate impact of benefits provided to survivor children. The load assumes 90% of members are married with two children at time of death, and benefits for each child are paid for approximately 8 years.
General Projection Methodology	<p>Open group projections assume:</p> <ul style="list-style-type: none"> <li>(i) Salaries will increase and members will decrement as specified in the actuarial assumption section.</li> <li>(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.</li> <li>(iii) Assets grow at the assumed rate of return.</li> <li>(iv) The sponsor makes the statutory required contribution on a monthly basis.</li> <li>(v) Non-vested members with accumulated plan balances as of July 1, 2017, will receive a refund during plan year end June 30, 2018.</li> </ul> <p>Closed group projections are the same as the open group projections except active members who retire, become disabled, die, or terminate are <u>not</u> replaced with new entrants.</p>
Decrement Timing	Mid-Year

**SECTION VII**

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**SUMMARY OF PRINCIPAL PLAN PROVISIONS**

# Summary of Principal Plan Provisions

## Actuarial Valuation as of July 1, 2017

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

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

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



## Summary of Principal Plan Provisions

### Actuarial Valuation as of July 1, 2017 (Continued)

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**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

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## APPENDIX – PROJECTION DATA

# Actuarial Projections – Optional Funding in 2019

## Table A-1

Valuation Plan Year End 30-Jun	Number		Total Assets								Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status	Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Member Contribs. <sup>a</sup>	Premium Tax		Assets (eoy)			
								Allocation Contribs.	Investment Income				
2017	20	26	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958	\$207,323	\$2,576,530	\$19,919,903	\$17,343,373	13%
2018	19	26	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,079	18,024,582	11%
2019	17	27	2,255,497	762,678	4,177	1,185,328	85,664	227,823	104,716	3,092,173	20,867,473	17,775,300	15%
2020	16	28	3,092,173	798,545	4,225	1,220,582	83,454	237,787	138,323	3,969,549	21,426,056	17,456,507	19%
2021	15	28	3,969,549	819,276	4,274	1,203,854	82,907	244,055	172,788	4,849,603	21,980,939	17,131,336	22%
2022	14	28	4,849,603	840,376	4,327	1,193,123	82,618	250,037	207,472	5,738,149	22,533,156	16,795,007	25%
2023	14	28	5,738,149	855,586	4,382	1,183,519	83,065	256,276	242,654	6,643,695	23,093,712	16,450,017	29%
2024	13	28	6,643,695	875,171	4,438	1,179,054	83,305	261,903	278,515	7,566,863	23,657,920	16,091,057	32%
2025	12	29	7,566,863	908,564	4,493	1,173,444	81,875	268,630	314,772	8,492,526	24,201,246	15,708,720	35%
2026	12	29	8,492,526	935,635	4,548	1,158,507	81,001	275,931	351,094	9,418,875	24,733,473	15,314,598	38%
2027	11	29	9,418,875	961,929	4,602	1,147,272	80,136	282,399	387,514	10,349,664	25,255,576	14,905,912	41%
2028	9	30	10,349,664	1,010,905	4,658	1,135,763	75,997	290,068	423,617	11,259,546	25,722,661	14,463,115	44%
2029	8	30	11,259,546	1,069,011	4,719	1,103,886	70,309	300,354	458,319	12,118,684	26,111,364	13,992,680	46%
2030	7	30	12,118,684	1,105,399	4,780	1,061,584	66,703	309,838	491,242	12,937,872	26,453,924	13,516,052	49%
2031	6	31	12,937,872	1,161,588	4,842	1,030,442	61,097	318,193	522,333	13,703,507	26,716,830	13,013,323	51%
2032	5	32	13,703,507	1,236,729	4,904	987,719	51,971	329,543	550,667	14,381,774	26,854,458	12,472,684	54%
2033	4	32	14,381,774	1,294,269	4,965	924,589	44,669	341,379	575,497	14,968,673	26,890,241	11,921,568	56%
2034	4	32	14,968,673	1,332,107	5,025	869,927	39,875	351,561	597,247	15,490,151	26,856,725	11,366,574	58%
2035	3	32	15,490,151	1,368,112	5,081	829,347	34,943	361,715	616,691	15,959,654	26,752,198	10,792,544	60%
2036	2	32	15,959,654	1,399,996	5,136	788,517	30,600	372,583	634,159	16,380,381	26,582,078	10,201,697	62%
2037	2	32	16,380,381	1,424,517	5,188	752,105	26,600	382,266	649,893	16,761,540	26,353,072	9,591,532	64%
2038	2	32	16,761,540	1,448,849	5,238	715,936	22,513	393,344	664,079	17,103,325	26,062,232	8,958,907	66%
2039	1	31	17,103,325	1,459,491	5,284	679,716	20,309	403,804	676,985	17,419,364	25,733,691	8,314,327	68%
2040	1	31	17,419,364	1,461,771	5,326	653,718	19,147	414,294	689,250	17,728,676	25,381,486	7,652,810	70%
2041	1	30	17,728,676	1,471,139	5,365	634,266	17,100	425,062	701,224	18,029,824	24,992,436	6,962,612	72%
2042	1	30	18,029,824	1,493,582	5,399	610,221	13,528	437,135	712,517	18,304,243	24,544,064	6,239,821	75%
2043	1	29	18,304,243	1,507,741	5,429	579,215	10,622	449,595	722,788	18,553,293	24,047,070	5,493,777	77%
2044	0	29	18,553,293	1,517,204	5,455	551,288	8,010	461,614	732,195	18,783,741	23,505,976	4,722,235	80%
2045	0	28	18,783,741	1,525,072	5,477	523,957	5,358	474,472	740,918	18,997,897	22,920,535	3,922,638	83%
2046	0	28	18,997,897	1,520,677	5,493	496,544	3,809	487,168	749,249	19,208,497	22,307,518	3,099,021	86%
2047	0	27	19,208,497	1,511,543	5,505	473,222	2,682	499,956	757,622	19,424,932	21,673,009	2,248,077	90%
2048	0	26	19,424,932	1,498,708	5,511	451,677	1,838	513,188	766,353	19,653,769	21,021,508	1,367,739	93%
2049	0	26	19,653,769	1,482,212	5,512	430,536	1,287	527,006	775,676	19,900,550	20,357,776	457,226	98%
2050	0	25	19,900,550	1,463,120	5,508	11,067	888	464,553	776,374	19,684,804	19,684,804	0	100%
2051	0	24	19,684,804	1,442,156	5,498	7,844	550	0	758,889	19,004,433	19,004,433	0	100%
2052	0	23	19,004,433	1,419,363	5,482	6,638	276	0	732,097	18,318,598	18,318,599	0	100%
2053	0	23	18,318,598	1,394,266	5,460	6,049	138	0	705,146	17,630,206	17,630,207	0	100%
2054	0	22	17,630,206	1,367,557	5,431	5,669	56	0	678,131	16,941,074	16,941,075	0	100%
2055	0	21	16,941,074	1,339,514	5,397	5,398	0	0	651,115	16,252,676	16,252,677	0	100%
2056	0	21	16,252,676	1,310,019	5,357	5,356	0	0	624,164	15,566,820	15,566,821	0	100%
2057	0	20	15,566,820	1,279,596	5,311	5,311	0	0	597,332	14,884,555	14,884,557	0	100%

<sup>a</sup>Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

# Actuarial Projections – Optional Funding in 2019

## Table A-2

### Employer Contributions

Valuation Plan Year End 30-Jun <sup>a</sup>	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	\$914,121	\$0	\$914,121	\$86,841	\$551,675	\$464,834	\$944,183	\$227,823	\$716,360	\$4,134	\$1,185,328	\$0
2019	901,722	32,484	934,207	85,664	543,119	457,455	996,737	237,787	758,950	4,177	1,220,582	3,411
2020	878,462	91,008	969,470	83,454	527,803	444,349	999,335	244,055	755,280	4,225	1,203,854	9,556
2021	872,704	140,034	1,012,737	82,907	523,069	440,162	998,724	250,037	748,687	4,274	1,193,123	14,704
2022	869,664	185,386	1,055,049	82,618	519,649	437,031	998,437	256,276	742,161	4,327	1,183,519	19,465
2023	874,371	234,031	1,108,402	83,065	521,404	438,339	998,236	261,903	736,333	4,382	1,179,054	24,573
2024	876,900	273,652	1,150,552	83,305	522,631	439,326	998,310	268,630	729,680	4,438	1,173,444	28,733
2025	861,838	327,270	1,189,108	81,875	513,440	431,565	998,379	275,931	722,448	4,493	1,158,507	34,363
2026	852,642	390,820	1,243,461	81,001	508,242	427,241	997,882	282,399	715,483	4,548	1,147,272	41,036
2027	843,534	444,817	1,288,352	80,136	503,797	423,661	997,568	290,068	707,500	4,602	1,135,763	46,706
2028	799,966	511,436	1,311,402	75,997	478,275	402,278	997,304	300,354	696,950	4,658	1,103,886	53,701
2029	740,095	609,637	1,349,732	70,309	441,222	370,913	995,790	309,838	685,952	4,719	1,061,584	64,012
2030	702,139	705,215	1,407,354	66,703	417,143	350,440	993,416	318,193	675,223	4,780	1,030,442	74,048
2031	643,131	786,560	1,429,691	61,097	381,807	320,710	991,710	329,543	662,167	4,842	987,719	82,589
2032	547,059	904,810	1,451,869	51,971	323,759	271,788	989,276	341,379	647,897	4,904	924,589	95,005
2033	470,196	1,030,282	1,500,478	44,669	276,046	231,377	985,145	351,561	633,584	4,965	869,927	108,180
2034	419,741	1,140,202	1,559,943	39,875	244,503	204,628	981,410	361,715	619,695	5,025	829,347	119,721
2035	367,821	1,244,438	1,612,260	34,943	212,223	177,280	978,739	372,583	606,156	5,081	788,517	130,666
2036	322,108	1,358,565	1,680,673	30,600	183,861	153,261	975,975	382,266	593,709	5,136	752,105	142,649
2037	279,997	1,462,352	1,742,348	26,600	157,317	130,717	973,375	393,344	580,031	5,188	715,936	153,547
2038	236,981	1,577,464	1,814,445	22,513	130,010	107,497	970,786	403,804	566,982	5,238	679,716	165,634
2039	213,780	1,681,698	1,895,478	20,309	115,090	94,781	967,947	414,294	553,653	5,284	653,718	176,578
2040	201,547	1,778,174	1,979,721	19,147	107,039	87,892	966,109	425,062	541,047	5,326	634,266	186,708
2041	179,998	1,874,140	2,054,139	17,100	94,098	76,998	964,993	437,135	527,858	5,365	610,221	196,785
2042	142,396	1,982,807	2,125,203	13,528	73,635	60,107	963,304	449,595	513,709	5,399	579,215	208,195
2043	111,809	2,097,407	2,209,215	10,622	57,702	47,080	960,393	461,614	498,779	5,429	551,288	220,228
2044	84,319	2,204,763	2,289,082	8,010	43,419	35,409	957,565	474,472	483,093	5,455	523,957	231,500
2045	56,395	2,320,753	2,377,149	5,358	29,012	23,654	954,581	487,168	467,413	5,477	496,544	243,679
2046	40,096	2,432,145	2,472,241	3,809	20,550	16,741	950,944	499,956	450,988	5,493	473,222	255,375
2047	28,236	2,541,786	2,570,022	2,682	14,385	11,703	947,658	513,188	434,470	5,505	451,677	266,888
2048	19,350	2,648,742	2,668,092	1,838	9,772	7,934	944,097	527,006	417,091	5,511	430,536	278,118
2049	13,546	2,753,776	2,767,322	1,287	6,841	5,554	938,971	464,553	397,497	5,512	11,067 <sup>b</sup>	289,146
2050	9,346	2,861,601	2,870,946	888	4,720	3,832	0	0	0	5,508	7,844 <sup>b</sup>	300,468
2051	5,785	2,970,825	2,976,610	550	2,894	2,344	0	0	0	5,498	6,638 <sup>b</sup>	311,937
2052	2,900	3,079,826	3,082,726	276	1,433	1,157	0	0	0	5,482	6,049 <sup>b</sup>	323,382
2053	1,451	3,191,583	3,193,034	138	727	589	0	0	0	5,460	5,669 <sup>b</sup>	335,116
2054	587	3,306,813	3,307,400	56	294	238	0	0	0	5,431	5,398 <sup>b</sup>	347,215
2055	0	3,426,415	3,426,415	0	0	0	0	0	0	5,397	5,356 <sup>b</sup>	359,774
2056	0	3,549,844	3,549,844	0	0	0	0	0	0	5,357	5,311 <sup>b</sup>	372,734
2057	0	3,677,709	3,677,709	0	0	0	0	0	0	5,311	5,260 <sup>b</sup>	386,159

<sup>a</sup> Assumes employer makes contributions for the applicable valuation plan year in the following fiscal year.

<sup>b</sup> Amount required to remain at 100% funded.

# Actuarial Projections – Conservation Funding in 2019

## Table A-3

Valuation			Total Assets								Actuarial		
Plan	Number		Assets	Benefit	Employer	Member	Premium Tax		Assets	Accrued	Unfunded	Funded	
	Year End	Pay					Allocation	Investment					Liability
30-Jun	Active	Status	(boy)	Payments	Expenses	Contribs.	Contribs. <sup>a</sup>	Contribs.	Income	(eoy)			
2017	20	26	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958	\$207,323	\$2,576,530	\$19,919,903	\$17,343,373	13%
2018	19	26	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,079	18,024,582	11%
2019	17	27	2,255,497	762,678	4,177	553,226	85,664	227,823	92,197	2,447,552	20,867,473	18,419,922	12%
2020	16	28	2,447,552	798,545	4,225	584,814	83,454	237,787	99,948	2,650,785	21,426,056	18,775,271	12%
2021	15	28	2,650,785	819,276	4,274	602,162	82,907	244,055	108,122	2,864,481	21,980,939	19,116,459	13%
2022	14	28	2,864,481	840,376	4,327	619,843	82,618	250,037	116,714	3,088,990	22,533,156	19,444,166	14%
2023	14	28	3,088,990	855,586	4,382	630,857	83,065	256,276	125,743	3,324,963	23,093,712	19,768,749	14%
2024	13	28	3,324,963	875,171	4,438	646,801	83,305	261,903	135,224	3,572,586	23,657,920	20,085,334	15%
2025	12	29	3,572,586	908,564	4,493	677,276	81,875	268,630	145,175	3,832,485	24,201,246	20,368,761	16%
2026	12	29	3,832,485	935,635	4,548	700,604	81,001	275,931	155,623	4,105,460	24,733,473	20,628,013	17%
2027	11	29	4,105,460	961,929	4,602	723,662	80,136	282,399	166,588	4,391,715	25,255,576	20,863,861	17%
2028	9	30	4,391,715	1,010,905	4,658	771,416	75,997	290,068	178,083	4,691,717	25,722,661	21,030,945	18%
2029	8	30	4,691,717	1,069,011	4,719	827,985	70,309	300,354	190,143	5,006,778	26,111,364	21,104,586	19%
2030	7	30	5,006,778	1,105,399	4,780	861,581	66,703	309,838	202,805	5,337,526	26,453,924	21,116,397	20%
2031	6	31	5,337,526	1,161,588	4,842	917,364	61,097	318,193	216,080	5,683,831	26,716,830	21,032,999	21%
2032	5	32	5,683,831	1,236,729	4,904	993,203	51,971	329,543	229,989	6,046,904	26,854,458	20,807,554	23%
2033	4	32	6,046,904	1,294,269	4,965	1,049,602	44,669	341,379	244,578	6,427,899	26,890,241	20,462,343	24%
2034	4	32	6,427,899	1,332,107	5,025	1,085,214	39,875	351,561	259,879	6,827,296	26,856,725	20,029,430	25%
2035	3	32	6,827,296	1,368,112	5,081	1,119,122	34,943	361,715	275,916	7,245,798	26,752,198	19,506,400	27%
2036	2	32	7,245,798	1,399,996	5,136	1,147,969	30,600	372,583	292,724	7,684,542	26,582,078	18,897,536	29%
2037	2	32	7,684,542	1,424,517	5,188	1,169,896	26,600	382,266	310,334	8,143,934	26,353,072	18,209,138	31%
2038	2	32	8,143,934	1,448,849	5,238	1,190,840	22,513	393,344	328,780	8,625,324	26,062,232	17,436,907	33%
2039	1	31	8,625,324	1,459,491	5,284	1,196,888	20,309	403,804	348,107	9,129,657	25,733,691	16,604,034	35%
2040	1	31	9,129,657	1,461,771	5,326	1,193,673	19,147	414,294	368,355	9,658,030	25,381,486	15,723,457	38%
2041	1	30	9,658,030	1,471,139	5,365	1,198,117	17,100	425,062	389,564	10,211,368	24,992,436	14,781,067	41%
2042	1	30	10,211,368	1,493,582	5,399	1,216,104	13,528	437,135	411,777	10,790,931	24,544,064	13,753,134	44%
2043	1	29	10,790,931	1,507,741	5,429	1,225,001	10,622	449,595	435,044	11,398,023	24,047,070	12,649,047	47%
2044	0	29	11,398,023	1,517,204	5,455	1,229,226	8,010	461,614	459,410	12,033,624	23,505,976	11,472,352	51%
2045	0	28	12,033,624	1,525,072	5,477	1,231,363	5,358	474,472	484,922	12,699,191	22,920,535	10,221,344	55%
2046	0	28	12,699,191	1,520,677	5,493	1,220,403	3,809	487,168	511,636	13,396,037	22,307,518	8,911,481	60%
2047	0	27	13,396,037	1,511,543	5,505	1,204,289	2,682	499,956	539,602	14,125,519	21,673,009	7,547,491	65%
2048	0	26	14,125,519	1,498,708	5,511	1,183,952	1,838	513,188	568,878	14,889,156	21,021,508	6,132,351	71%
2049	0	26	14,889,156	1,482,212	5,512	1,159,340	1,287	527,006	599,525	15,688,590	20,357,776	4,669,186	77%
2050	0	25	15,688,590	1,463,120	5,508	1,131,594	888	541,474	631,610	16,525,529	19,684,804	3,159,276	84%
2051	0	24	16,525,529	1,442,156	5,498	1,101,713	550	556,276	665,197	17,401,610	19,004,433	1,602,823	92%
2052	0	23	17,401,610	1,419,363	5,482	1,069,523	276	571,680	700,355	18,318,599	18,318,599	0	100%
2053	0	23	18,318,599	1,394,266	5,460	6,048	138	0	705,146	17,630,205	17,630,207	0	100%
2054	0	22	17,630,205	1,367,557	5,431	5,670	56	0	678,131	16,941,075	16,941,075	0	100%
2055	0	21	16,941,075	1,339,514	5,397	5,397	0	0	651,115	16,252,676	16,252,677	0	100%
2056	0	21	16,252,676	1,310,019	5,357	5,357	0	0	624,164	15,566,821	15,566,821	0	100%
2057	0	20	15,566,821	1,279,596	5,311	5,311	0	0	597,332	14,884,557	14,884,557	0	100%

<sup>a</sup> Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

# Actuarial Projections – Conservation Funding in 2019

## Table A-4

Plan Year End	Benefit Payment Account <sup>a</sup>							Accumulation Account <sup>b</sup>					Statewide Employer Contribution		
	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	8.00% <sup>c</sup> of Pay Member Contribs.	62.11% of Pay Premium Tax Allocation	Investment Income	Transfer (To)/From Accumulation Account	Assets (boy) <sup>f</sup>	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Member Contribs.	37.89% of Pay Premium Tax Allocation		Investment Income	
2018	\$2,576,530	\$988,757	\$257,392	\$96,110	\$219,396	\$94,826	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	2,255,497	766,855	553,226	72,138	141,491	90,220	(2,345,717)	2,345,717	0	0	13,526	86,332	1,978	99,948	3,411
2020	0	802,770	584,814	70,277	147,679	0	0	2,447,553	0	0	13,177	90,108	99,948	14,704	9,556
2021	0	823,550	602,162	69,816	151,572	0	0	2,650,786	0	0	13,091	92,483	108,122	14,704	14,704
2022	0	844,703	619,843	69,573	155,287	0	0	2,864,482	0	0	13,045	94,750	116,714	19,465	19,465
2023	0	859,968	630,857	69,949	159,162	0	0	3,088,991	0	0	13,116	97,114	125,743	24,573	24,573
2024	0	879,609	646,801	70,152	162,656	0	0	3,324,964	0	0	13,153	99,246	135,225	28,733	28,733
2025	0	913,057	677,276	68,947	166,834	0	0	3,572,589	0	0	12,928	101,796	145,175	34,363	34,363
2026	0	940,183	700,604	68,211	171,368	0	0	3,832,487	0	0	12,790	104,562	155,624	41,036	41,036
2027	0	966,531	723,662	67,483	175,386	0	0	4,105,464	0	0	12,653	107,013	166,588	46,706	46,706
2028	0	1,015,563	771,416	63,998	180,149	0	0	4,391,718	0	0	11,999	109,920	178,083	53,701	53,701
2029	0	1,073,730	827,985	59,208	186,537	0	0	4,691,720	0	0	11,101	113,817	190,143	64,012	64,012
2030	0	1,110,179	861,581	56,171	192,427	0	0	5,006,781	0	0	10,532	117,411	202,805	74,048	74,048
2031	0	1,166,430	917,364	51,450	197,616	0	0	5,337,529	0	0	9,647	120,577	216,080	82,589	82,589
2032	0	1,241,633	993,203	43,765	204,665	0	0	5,683,834	0	0	8,206	124,878	229,989	95,005	95,005
2033	0	1,299,234	1,049,602	37,616	212,016	0	0	6,046,907	0	0	7,053	129,364	244,578	108,180	108,180
2034	0	1,337,132	1,085,214	33,579	218,339	0	0	6,427,902	0	0	6,296	133,222	259,879	119,721	119,721
2035	0	1,373,193	1,119,122	29,426	224,645	0	0	6,827,299	0	0	5,517	137,070	275,916	130,666	130,666
2036	0	1,405,132	1,147,969	25,768	231,395	0	0	7,245,801	0	0	4,832	141,188	292,724	142,649	142,649
2037	0	1,429,705	1,169,896	22,400	237,409	0	0	7,684,545	0	0	4,200	144,858	310,334	153,547	153,547
2038	0	1,454,087	1,190,840	18,958	244,289	0	0	8,143,937	0	0	3,555	149,055	328,780	165,634	165,634
2039	0	1,464,775	1,196,888	17,102	250,785	0	0	8,625,327	0	0	3,207	153,019	348,107	176,578	176,578
2040	0	1,467,097	1,193,673	16,124	257,300	0	0	9,129,661	0	0	3,023	156,994	368,355	186,708	186,708
2041	0	1,476,504	1,198,117	14,400	263,987	0	0	9,658,033	0	0	2,700	161,075	389,565	196,785	196,785
2042	0	1,498,981	1,216,104	11,392	271,485	0	0	10,211,372	0	0	2,136	165,650	411,778	208,195	208,195
2043	0	1,513,170	1,225,001	8,945	279,224	0	0	10,790,936	0	0	1,677	170,372	435,045	220,228	220,228
2044	0	1,522,659	1,229,226	6,745	286,688	0	0	11,398,029	0	0	1,265	174,926	459,410	231,500	231,500
2045	0	1,530,549	1,231,363	4,512	294,674	0	0	12,033,630	0	0	846	179,799	484,923	243,679	243,679
2046	0	1,526,170	1,220,403	3,208	302,559	0	0	12,699,198	0	0	601	184,610	511,636	255,375	255,375
2047	0	1,517,048	1,204,289	2,258	310,501	0	0	13,396,044	0	0	424	189,455	539,602	266,888	266,888
2048	0	1,504,219	1,183,952	1,548	318,719	0	0	14,125,526	0	0	290	194,470	568,878	278,118	278,118
2049	0	1,487,724	1,159,340	1,084	327,300	0	0	14,889,164	0	0	203	199,706	599,526	289,146	289,146
2050	0	1,468,628	1,131,594	748	336,286	0	0	15,688,598	0	0	140	205,188	631,610	300,468	300,468
2051	0	1,447,654	1,101,713	463	345,478	0	0	16,525,537	0	0	87	210,798	665,198	311,937	311,937
2052	0	1,424,800	1,069,523	232	355,045	0	0	17,401,619	45	0	44	216,635	700,355	323,382	323,382
2053	0	0	0	0	0	0	0	18,318,608	1,399,726	6,048	138	0	705,147	335,116	335,116
2054	0	0	0	0	0	0	0	17,630,215	1,372,988	5,670	56	0	678,132	347,215	347,215
2055	0	0	0	0	0	0	0	16,941,085	1,344,911	5,397	0	0	651,116	359,774	359,774
2056	0	0	0	0	0	0	0	16,252,687	1,315,376	5,357	0	0	624,164	372,734	372,734
2057	0	0	0	0	0	0	0	15,566,832	1,284,907	5,311	0	0	597,332	386,159	386,159

<sup>a</sup> 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.

<sup>b</sup> Assets accumulate in the Pension and Relief Fund.

<sup>c</sup> Includes transfer from Benefit Payment Account to Accumulation Account in Plan Year End June 30, 2042.

<sup>d</sup> Blended employee contribution rate of 9.50% of pay less 1.50% of pay going into the Accumulation Account.

# Actuarial Projections – Optional Funding in (N/A)

## Table A-5

Valuation			Total Assets								Actuarial		
Plan	Number		Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Member Contribs.	Premium Tax		Assets (eoy)	Accrued Liability	Unfunded Liability	Funded Ratio
Year End 30-Jun	Pay Active	Status						Allocation Contribs.	Investment Income				
2017	20	26	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958	\$207,323	\$2,576,530	\$19,919,903	\$17,343,373	13%
2018	20	26	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,080	18,024,583	11%
2019	20	27	2,255,497	762,678	4,271	275,409	88,967	227,823	86,759	2,167,506	20,886,351	18,718,845	10%
2020	20	28	2,167,506	798,678	4,476	294,688	92,508	237,787	83,172	2,072,507	21,498,401	19,425,894	10%
2021	20	28	2,072,507	819,883	4,638	315,316	96,566	244,055	79,562	1,983,485	22,136,998	20,153,513	9%
2022	20	28	1,983,485	841,755	4,791	337,388	100,561	250,037	76,200	1,901,124	22,802,122	20,900,998	8%
2023	20	28	1,901,124	857,923	4,950	361,005	105,675	256,276	73,274	1,834,481	23,507,760	21,673,279	8%
2024	20	28	1,834,481	878,618	5,081	386,275	109,673	261,903	70,887	1,779,519	24,245,202	22,465,683	7%
2025	20	29	1,779,519	913,220	5,249	413,314	113,497	268,630	68,744	1,725,235	24,999,131	23,273,896	7%
2026	20	29	1,725,235	941,635	5,434	442,246	118,821	275,931	66,829	1,681,993	25,786,461	24,104,468	7%
2027	20	29	1,681,993	969,505	5,584	473,203	123,115	282,399	65,371	1,650,992	26,604,239	24,953,247	6%
2028	20	30	1,650,992	1,020,258	5,767	506,327	125,467	290,068	63,977	1,610,806	27,416,404	25,805,598	6%
2029	20	30	1,610,806	1,080,372	6,031	541,770	129,422	300,354	62,158	1,558,107	28,219,713	26,661,606	6%
2030	20	31	1,558,107	1,119,157	6,269	579,694	135,012	309,838	60,326	1,517,551	29,047,357	27,529,806	5%
2031	20	31	1,517,551	1,178,172	6,465	620,273	137,173	318,193	58,543	1,467,096	29,860,182	28,393,086	5%
2032	20	32	1,467,096	1,256,405	6,751	663,692	139,682	329,543	56,105	1,392,962	30,636,464	29,243,502	5%
2033	20	32	1,392,962	1,317,382	7,037	710,150	144,562	341,379	53,177	1,317,811	31,407,009	30,089,198	4%
2034	20	32	1,317,811	1,359,186	7,269	759,861	150,327	351,561	50,639	1,263,744	32,198,914	30,935,170	4%
2035	20	33	1,263,744	1,399,507	7,478	813,051	155,490	361,715	49,030	1,236,045	33,010,512	31,774,467	4%
2036	20	32	1,236,045	1,436,040	7,706	869,965	162,325	372,583	48,672	1,245,844	33,856,201	32,610,357	4%
2037	20	32	1,245,844	1,465,673	7,895	930,863	168,199	382,266	49,987	1,303,592	34,740,403	33,436,811	4%
2038	20	32	1,303,592	1,495,444	8,110	996,023	174,703	393,344	53,343	1,417,450	35,669,785	34,252,335	4%
2039	20	32	1,417,450	1,512,329	8,306	1,065,745	181,789	403,804	59,286	1,607,440	36,661,602	35,054,162	4%
2040	20	32	1,607,440	1,525,088	8,496	1,140,347	189,450	414,294	68,466	1,886,413	37,722,721	35,836,308	5%
2041	20	32	1,886,413	1,550,881	8,693	1,220,171	196,275	425,062	81,040	2,249,386	38,838,586	36,589,200	6%
2042	20	32	2,249,386	1,594,101	8,924	1,305,583	202,883	437,135	96,760	2,688,721	39,993,372	37,304,651	7%
2043	20	32	2,688,721	1,633,134	9,168	1,396,974	210,687	449,595	115,767	3,219,443	41,200,433	37,980,990	8%
2044	20	32	3,219,443	1,672,010	9,394	1,494,762	217,838	461,614	138,537	3,850,790	42,459,897	38,609,107	9%
2045	20	31	3,850,790	1,713,388	9,647	1,599,395	225,887	474,472	165,453	4,592,963	43,774,814	39,181,851	10%
2046	20	31	4,592,963	1,747,859	9,892	1,711,353	234,537	487,168	197,092	5,465,362	45,157,294	39,691,932	12%
2047	20	31	5,465,362	1,783,367	10,138	1,831,148	243,065	499,956	234,074	6,480,100	46,610,927	40,130,827	14%
2048	20	31	6,480,100	1,820,516	10,392	1,959,328	251,437	513,188	276,890	7,650,036	48,134,556	40,484,520	16%
2049	20	31	7,650,036	1,861,706	10,660	2,096,481	260,334	527,006	326,033	8,987,524	49,725,569	40,738,045	18%
2050	20	31	8,987,524	1,909,747	10,941	2,243,235	269,799	541,474	381,955	10,503,299	51,385,167	40,881,868	20%
2051	20	31	10,503,299	1,962,373	11,229	2,400,261	279,063	556,276	445,125	12,210,422	53,114,790	40,904,366	23%
2052	20	31	12,210,422	2,017,311	11,529	2,568,279	288,431	571,680	516,133	14,126,105	54,911,501	40,785,398	26%
2053	20	31	14,126,105	2,077,293	11,845	2,748,059	298,551	587,869	595,648	16,267,094	56,774,665	40,507,571	29%
2054	20	31	16,267,094	2,143,367	12,170	2,940,423	309,170	604,544	684,323	18,650,017	58,705,390	40,055,373	32%
2055	20	31	18,650,017	2,213,628	12,503	3,146,253	320,274	621,771	782,878	21,295,062	60,706,220	39,411,158	35%
2056	20	31	21,295,062	2,286,812	12,843	3,366,491	331,774	639,445	892,164	24,225,281	62,779,522	38,554,241	39%
2057	20	31	24,225,281	2,363,729	13,192	3,602,145	343,732	657,645	1,013,106	27,464,989	64,927,492	37,462,503	42%

<sup>a</sup> Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

# Actuarial Projections – Optional Funding in (N/A)

## Table A-6

Valuation Plan Year End 30-Jun <sup>a,b</sup>	Employer Contributions								Minimum Payment			Statewide Employer Contribution
	Total Payroll	Employee Contributions	Gross Normal Cost	Net Employer Normal Cost	Amortization of UAAL	Premium Tax Allocation Contributions	Net Employer Amortization	Expenses	Optional Employer Contribution	Alternative Employer Contribution	Minimum Employer Contribution	
2018	\$914,121	\$86,841	\$551,675	\$464,834	\$944,183	\$227,823	\$716,360	\$4,134	\$1,185,328	\$275,409	\$275,409	\$0
2019	934,207	88,967	561,756	472,789	996,737	237,787	758,950	4,271	1,236,010	294,688	294,688	0
2020	969,470	92,508	580,097	487,589	1,052,381	244,055	808,326	4,476	1,300,391	315,316	315,316	0
2021	1,012,737	96,566	603,697	507,131	1,111,397	250,037	861,360	4,638	1,373,130	337,388	337,388	0
2022	1,055,049	100,561	626,575	526,015	1,174,573	256,276	918,297	4,791	1,449,103	361,005	361,005	0
2023	1,108,402	105,675	656,571	550,896	1,242,282	261,903	980,379	4,950	1,536,225	386,275	386,275	0
2024	1,150,552	109,673	680,922	571,249	1,315,296	268,630	1,046,666	5,081	1,622,996	413,314	413,314	0
2025	1,189,108	113,497	702,917	589,420	1,393,897	275,931	1,117,966	5,249	1,712,635	442,246	442,246	0
2026	1,243,461	118,821	734,672	615,850	1,478,453	282,399	1,196,054	5,434	1,817,338	473,203	473,203	0
2027	1,288,352	123,115	761,784	638,669	1,570,125	290,068	1,280,057	5,584	1,924,310	506,327	506,327	0
2028	1,311,402	125,467	775,107	649,641	1,669,536	300,354	1,369,182	5,767	2,024,590	541,770	541,770	0
2029	1,349,732	129,422	795,095	665,673	1,776,724	309,838	1,466,886	6,031	2,138,590	579,694	579,694	0
2030	1,407,354	135,012	826,701	691,688	1,892,851	318,193	1,574,658	6,269	2,272,615	620,273	620,273	0
2031	1,429,691	137,173	839,000	701,827	2,019,938	329,543	1,690,395	6,465	2,398,687	663,692	663,692	0
2032	1,451,869	139,682	849,825	710,143	2,158,449	341,379	1,817,070	6,751	2,533,963	710,150	710,150	0
2033	1,500,478	144,562	875,282	730,720	2,309,774	351,561	1,958,213	7,037	2,695,971	759,861	759,861	0
2034	1,559,943	150,327	908,129	757,802	2,477,009	361,715	2,115,294	7,269	2,880,365	813,051	813,051	0
2035	1,612,260	155,490	937,055	781,564	2,663,728	372,583	2,291,145	7,478	3,080,188	869,965	869,965	0
2036	1,680,673	162,325	975,633	813,308	2,873,380	382,266	2,491,114	7,706	3,312,128	930,863	930,863	0
2037	1,742,348	168,199	1,010,195	841,996	3,111,454	393,344	2,718,110	7,895	3,568,001	996,023	996,023	0
2038	1,814,445	174,703	1,050,389	875,686	3,384,234	403,804	2,980,430	8,110	3,864,226	1,065,745	1,065,745	0
2039	1,895,478	181,789	1,096,284	914,494	3,700,725	414,294	3,286,431	8,306	4,209,231	1,140,347	1,140,347	0
2040	1,979,721	189,450	1,144,036	954,586	4,073,227	425,062	3,648,165	8,496	4,611,248	1,220,171	1,220,171	0
2041	2,054,139	196,275	1,186,241	989,967	4,518,836	437,135	4,081,701	8,693	5,080,362	1,305,583	1,305,583	0
2042	2,125,203	202,883	1,227,958	1,025,075	5,062,258	449,595	4,612,663	8,924	5,646,662	1,396,974	1,396,974	0
2043	2,209,215	210,687	1,277,505	1,066,817	5,741,693	461,614	5,280,079	9,168	6,356,064	1,494,762	1,494,762	0
2044	2,289,082	217,838	1,324,520	1,106,682	6,620,087	474,472	6,145,615	9,394	7,261,691	1,599,395	1,599,395	0
2045	2,377,149	225,887	1,376,204	1,150,317	7,804,676	487,168	7,317,508	9,647	8,477,472	1,711,353	1,711,353	0
2046	2,472,241	234,537	1,431,153	1,196,617	9,498,647	499,956	8,998,691	9,892	10,205,200	1,831,148	1,831,148	0
2047	2,570,022	243,065	1,487,544	1,244,480	12,137,504	513,188	11,624,316	10,138	12,878,933	1,959,328	1,959,328	0
2048	2,668,092	251,437	1,544,007	1,292,569	16,853,251	527,006	16,326,245	10,392	17,629,206	2,096,481	2,096,481	0
2049	2,767,322	260,334	1,600,967	1,340,633	27,793,162	541,474	27,251,688	10,660	28,602,981	2,243,235	2,243,235	0
2050	2,870,946	269,799	1,660,312	1,390,513	41,544,804	556,276	40,988,528	10,941	42,389,982	2,400,261	2,400,261	0
2051	2,976,610	279,063	1,720,644	1,441,581	61,691,474	571,680	61,119,794	11,229	42,561,650	2,568,279	2,568,279	0
2052	3,082,726	288,431	1,780,875	1,492,445	84,714,420	587,869	84,126,551	11,529	42,469,001	2,748,059	2,748,059	0
2053	3,193,034	298,551	1,843,252	1,544,701	114,593,092	604,544	114,988,548	11,845	42,217,948	2,940,423	2,940,423	0
2054	3,307,400	309,170	1,908,020	1,598,850	160,309,765	621,771	160,687,994	12,170	41,792,073	3,146,253	3,146,253	0
2055	3,426,415	320,274	1,975,666	1,655,391	218,848,612	639,445	219,488,167	12,503	41,172,035	3,366,491	3,366,491	0
2056	3,549,844	331,774	2,046,100	1,714,326	299,191,640	657,645	300,849,285	12,843	40,337,152	3,602,145	3,602,145	0
2057	3,677,709	343,732	2,119,493	1,775,760	403,317,752	676,440	404,644,312	13,192	39,264,568	3,854,295	3,854,295	0

<sup>a</sup> Assumes sponsor selects Optional funding policy if contributions are lower.

<sup>b</sup> Assumes employer makes contributions for the applicable valuation plan year in the following fiscal year.

<sup>c</sup> Amount required to remain at 100% funded.



# Actuarial Projections – Conservation Funding in 2042

## Table A-7

Valuation Plan Year End 30-Jun	Number		Total Assets								Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status	Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Member Contribs. <sup>a</sup>	Premium Tax		Assets (eoy)			
								Allocation Contribs.	Investment Income				
2017	20	26	\$2,444,156	\$617,725	\$750	\$241,363	\$94,205	\$207,958	\$207,323	\$2,576,530	\$19,919,903	\$17,343,373	13%
2018	20	26	2,576,530	984,623	4,134	257,392	96,110	219,396	94,826	2,255,497	20,280,080	18,024,583	11%
2019	20	27	2,255,497	762,678	4,271	275,409	88,967	227,823	86,759	2,167,506	20,886,351	18,718,845	10%
2020	20	28	2,167,506	798,678	4,476	294,688	92,508	237,787	83,172	2,072,507	21,498,401	19,425,894	10%
2021	20	28	2,072,507	819,883	4,638	315,316	96,566	244,055	79,562	1,983,485	22,136,998	20,153,513	9%
2022	20	28	1,983,485	841,755	4,791	337,388	100,561	250,037	76,199	1,901,124	22,802,122	20,900,998	8%
2023	20	28	1,901,124	857,923	4,950	361,005	105,675	256,276	73,274	1,834,481	23,507,760	21,673,279	8%
2024	20	28	1,834,481	878,618	5,081	386,275	109,673	261,903	70,887	1,779,520	24,245,202	22,465,682	7%
2025	20	29	1,779,520	913,220	5,249	413,314	113,497	268,630	68,744	1,725,236	24,999,131	23,273,895	7%
2026	20	29	1,725,236	941,635	5,434	442,246	118,821	275,931	66,830	1,681,995	25,786,461	24,104,466	7%
2027	20	29	1,681,995	969,505	5,584	473,203	123,115	282,399	65,371	1,650,994	26,604,239	24,953,245	6%
2028	20	30	1,650,994	1,020,258	5,767	506,327	125,467	290,068	63,977	1,610,808	27,416,404	25,805,596	6%
2029	20	30	1,610,808	1,080,372	6,031	541,770	129,422	300,354	62,158	1,558,109	28,219,713	26,661,604	6%
2030	20	31	1,558,109	1,119,157	6,269	579,694	135,012	309,838	60,326	1,517,553	29,047,357	27,529,804	5%
2031	20	31	1,517,553	1,178,172	6,465	620,273	137,173	318,193	58,544	1,467,099	29,860,182	28,393,083	5%
2032	20	32	1,467,099	1,256,405	6,751	663,692	139,682	329,543	56,105	1,392,965	30,636,464	29,243,499	5%
2033	20	32	1,392,965	1,317,382	7,037	710,150	144,562	341,379	53,177	1,317,814	31,407,009	30,089,195	4%
2034	20	32	1,317,814	1,359,186	7,269	759,861	150,327	351,561	50,639	1,263,747	32,198,914	30,935,167	4%
2035	20	33	1,263,747	1,399,507	7,478	813,051	155,490	361,715	49,030	1,236,048	33,010,512	31,774,464	4%
2036	20	32	1,236,048	1,436,040	7,706	869,965	162,325	372,583	48,672	1,245,847	33,856,201	32,610,354	4%
2037	20	32	1,245,847	1,465,673	7,895	930,863	168,199	382,266	49,988	1,303,595	34,740,403	33,436,808	4%
2038	20	32	1,303,595	1,495,444	8,110	996,023	174,703	393,344	53,342	1,417,453	35,669,785	34,252,332	4%
2039	20	32	1,417,453	1,512,329	8,306	1,065,745	181,789	403,804	59,287	1,607,443	36,661,602	35,054,159	4%
2040	20	32	1,607,443	1,525,088	8,496	1,140,347	189,450	414,294	68,467	1,886,417	37,722,721	35,836,304	5%
2041	19	32	1,886,417	1,550,881	8,693	1,220,171	196,275	425,062	81,040	2,249,391	38,838,582	36,589,191	6%
2042	17	32	2,249,391	1,594,101	8,699	1,280,873	193,043	437,135	96,080	2,653,722	39,937,146	37,283,424	7%
2043	16	32	2,653,722	1,632,738	8,716	1,317,467	190,157	449,595	112,402	3,081,890	41,021,731	37,939,841	8%
2044	15	32	3,081,890	1,670,462	8,741	1,353,432	187,151	461,614	129,672	3,534,556	42,092,366	38,557,810	8%
2045	14	31	3,534,556	1,710,156	8,773	1,391,454	183,688	474,472	147,931	4,013,172	43,142,247	39,129,075	9%
2046	14	31	4,013,172	1,742,407	8,811	1,421,559	180,873	487,168	167,228	4,518,782	44,180,824	39,662,042	10%
2047	13	31	4,518,782	1,775,287	8,852	1,452,733	177,582	499,956	187,606	5,052,520	45,206,957	40,154,437	11%
2048	12	31	5,052,520	1,809,416	8,896	1,485,771	173,419	513,188	209,113	5,615,699	46,212,475	40,596,776	12%
2049	11	31	5,615,699	1,847,175	8,943	1,522,605	168,744	527,006	231,802	6,209,738	47,185,426	40,975,688	13%
2050	10	31	6,209,738	1,891,372	8,992	1,566,057	163,551	541,474	255,731	6,836,188	48,116,818	41,280,630	14%
2051	9	31	6,836,188	1,939,598	9,042	1,614,312	157,367	556,276	280,959	7,496,462	48,999,152	41,502,690	15%
2052	9	31	7,496,462	1,989,563	9,093	1,664,909	150,206	571,680	307,545	8,192,146	49,818,829	41,626,683	16%
2053	8	31	8,192,146	2,043,959	9,146	1,720,121	142,434	587,869	335,554	8,925,019	50,562,512	41,637,493	18%
2054	7	31	8,925,019	2,103,784	9,198	1,781,083	134,054	604,544	365,055	9,696,773	51,219,354	41,522,581	19%
2055	6	31	9,696,773	2,167,197	9,251	1,845,969	125,037	621,771	396,116	10,509,218	51,779,601	41,270,383	20%
2056	5	31	10,509,218	2,232,810	9,303	1,913,474	115,341	639,445	428,808	11,364,173	52,233,229	40,869,056	22%
2057	5	31	11,364,173	2,301,386	9,355	1,984,393	104,886	657,645	463,205	12,263,561	52,568,589	40,305,028	23%

<sup>a</sup> Member contributions include additional amounts for DROP members of \$9,269 for plan year end June 30, 2018.

# Actuarial Projections – Conservation Funding in 2042

## Table A-8

Plan Year End 30-Jun	Benefit Payment Account <sup>a</sup>						Accumulation Account <sup>b</sup>						Minimum Payment			Statewide Employer Contribution
	Assets (boy)	Net Pmts and Expenses	Employer Contribs.	8.00% <sup>c</sup> of Pay Member Contribs.	36.44% of Premium Tax Allocation	Investment Income	Assets (boy) <sup>c</sup>	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Member Contribs.	63.56% of Premium Tax Allocation	Investment Income	Conservation Employer Cont.	Alternative Employer Cont.	Minimum Alt /Cons Cont.	
2018	\$2,576,530	\$988,757	\$257,392	\$96,110	\$219,396	\$94,826	\$0	\$0	\$0	\$0	\$0	\$0	NA	\$257,392	\$257,392	\$0
2019	2,255,497	766,949	275,409	88,967	227,823	86,759	0	0	0	0	0	0	NA	275,409	275,409	0
2020	2,167,506	803,154	294,688	92,508	237,787	83,172	0	0	0	0	0	0	NA	294,688	294,688	0
2021	2,072,506	824,521	315,316	96,566	244,055	79,562	0	0	0	0	0	0	NA	315,316	315,316	0
2022	1,983,484	846,546	337,388	100,561	250,037	76,199	0	0	0	0	0	0	NA	337,388	337,388	0
2023	1,901,123	862,873	361,005	105,675	256,276	73,274	0	0	0	0	0	0	NA	361,005	361,005	0
2024	1,834,480	883,699	386,275	109,673	261,903	70,887	0	0	0	0	0	0	NA	386,275	386,275	0
2025	1,779,518	918,469	413,314	113,497	268,630	68,744	0	0	0	0	0	0	NA	413,314	413,314	0
2026	1,725,234	947,069	442,246	118,821	275,931	66,830	0	0	0	0	0	0	NA	442,246	442,246	0
2027	1,681,993	975,089	473,203	123,115	282,399	65,371	0	0	0	0	0	0	NA	473,203	473,203	0
2028	1,650,992	1,026,025	506,327	125,467	290,068	63,977	0	0	0	0	0	0	NA	506,327	506,327	0
2029	1,610,806	1,086,403	541,770	129,422	300,354	62,158	0	0	0	0	0	0	NA	541,770	541,770	0
2030	1,558,107	1,125,426	579,694	135,012	309,838	60,326	0	0	0	0	0	0	NA	579,694	579,694	0
2031	1,517,551	1,184,637	620,273	137,173	318,193	58,544	0	0	0	0	0	0	NA	620,273	620,273	0
2032	1,467,097	1,263,156	663,692	139,682	329,543	56,105	0	0	0	0	0	0	NA	663,692	663,692	0
2033	1,392,963	1,324,419	710,150	144,562	341,379	53,177	0	0	0	0	0	0	NA	710,150	710,150	0
2034	1,317,813	1,366,455	759,861	150,327	351,561	50,639	0	0	0	0	0	0	NA	759,861	759,861	0
2035	1,263,745	1,406,985	813,051	155,490	361,715	49,030	0	0	0	0	0	0	NA	813,051	813,051	0
2036	1,236,046	1,443,746	869,965	162,325	372,583	48,672	0	0	0	0	0	0	NA	869,965	869,965	0
2037	1,245,845	1,473,568	930,863	168,199	382,266	49,988	0	0	0	0	0	0	NA	930,863	930,863	0
2038	1,303,593	1,503,554	996,023	174,703	393,344	53,342	0	0	0	0	0	0	NA	996,023	996,023	0
2039	1,417,451	1,520,635	1,065,745	181,789	403,804	59,287	0	0	0	0	0	0	NA	1,065,745	1,065,745	0
2040	1,607,441	1,533,584	1,140,347	189,450	414,294	68,467	0	0	0	0	0	0	NA	1,140,347	1,140,347	0
2041	1,886,415	1,559,574	1,220,171	196,275	425,062	81,040	0	0	0	0	0	0	NA	1,220,171	1,220,171	0
2042	2,249,389	1,602,800	1,280,878	162,616	159,306	89,976	2,339,367	0	0	30,427	277,828	6,105	1,280,878	1,305,583	1,280,878	10,159
2043	0	1,641,454	1,317,472	160,135	163,847	0	2,653,727	0	0	30,022	285,748	112,403	1,317,472	1,396,974	1,317,472	21,816
2044	0	1,679,203	1,353,437	157,539	168,227	0	3,081,900	0	0	29,612	293,387	129,673	1,353,437	1,494,762	1,353,437	33,067
2045	0	1,718,929	1,391,459	154,557	172,913	0	3,534,572	0	0	29,131	301,559	147,932	1,391,459	1,599,395	1,391,459	45,681
2046	0	1,751,218	1,421,564	152,114	177,540	0	4,013,194	0	0	28,759	309,628	167,229	1,421,564	1,711,353	1,421,564	58,274
2047	0	1,784,139	1,452,738	149,201	182,200	0	4,518,810	0	0	28,381	317,756	187,607	1,452,738	1,831,148	1,452,738	71,185
2048	0	1,818,312	1,485,776	145,513	187,023	0	5,052,553	0	0	27,906	326,166	209,114	1,485,776	1,959,328	1,485,776	84,808
2049	0	1,856,118	1,522,611	141,449	192,058	0	5,615,739	0	0	27,295	334,948	231,803	1,522,611	2,096,481	1,522,611	99,504
2050	0	1,900,364	1,566,063	136,970	197,331	0	6,209,785	0	0	26,581	344,143	255,733	1,566,063	2,243,235	1,566,063	115,384
2051	0	1,948,640	1,614,318	131,597	202,725	0	6,836,242	0	0	25,770	353,551	280,962	1,614,318	2,400,261	1,614,318	132,151
2052	0	1,998,656	1,664,915	125,402	208,339	0	7,496,525	0	0	24,804	363,341	307,548	1,664,915	2,568,279	1,664,915	150,057
2053	0	2,053,105	1,720,127	118,739	214,239	0	8,192,217	0	0	23,695	373,630	335,557	1,720,127	2,748,059	1,720,127	169,403
2054	0	2,112,982	1,781,089	111,577	220,316	0	8,925,099	0	0	22,477	384,228	365,058	1,781,089	2,940,423	1,781,089	189,941
2055	0	2,176,448	1,845,975	103,879	226,594	0	9,696,862	0	0	21,158	395,177	396,120	1,845,975	3,146,253	1,845,975	211,670
2056	0	2,242,113	1,913,480	95,598	233,035	0	10,509,317	0	0	19,743	406,410	428,812	1,913,480	3,366,491	1,913,480	234,534
2057	0	2,310,741	1,984,399	86,674	239,668	0	11,364,282	0	0	18,212	417,977	463,210	1,984,399	3,602,145	1,984,399	258,678

<sup>a</sup> 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.

<sup>b</sup> Assets accumulate in the Pension and Relief Fund.

<sup>c</sup> Includes transfer from Benefit Payment Account to Accumulation Account in Plan Year End June 30, 2042.

<sup>d</sup> Blended employee contribution rate of 9.50% of pay less 1.50% of pay going into the Accumulation Account.